

MODEL DEVELOPMENT FOR MEASUREMENT OF RESILIENCE IN ADOLESCENTS

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MODEL DEVELOPMENT TO MEASURE RESILIENCE IN ADOLESCENTS

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ABSTRACT

Coping with painful events and unpleasant emotions is a struggle for every human being. The ability to cope effectively with these events and emotions can be termed *resilience* (Blum, 1998). The study of resilience is based on strengths a person has and how difficulties in life can be overcome. It is this emphasis on strengths and positive assets that will be the focus of this model, rather than weakness or vulnerability. The focus of this study was to develop a model to aid researchers in measuring resilience in adolescents. Results provided evidence for a model containing sub dimensions of self-esteem, parental involvement, family relationships, other relationships, religion, neighborhood belonging, school belonging, and school safety.

APPROVAL PAGE

The faculty listed below, appointed by the Dean of the School of Education, have examined a dissertation titled “Model Development to Measure Resilience in Adolescents” presented by Rachel Kirkpatrick Smiley, candidate for the Doctor of Counseling Psychology degree, and hereby certify that in their opinion it is worthy of acceptance.

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CHAPTER 1

INTRODUCTION

Coping with painful events and unpleasant emotions is a struggle for every human being. The ability to cope effectively with these events and emotions can be termed *resilience* (Blum, 1998). According to Smith & Carlson (1997), the adolescent population may be especially susceptible to stressful events, and perceive some events as more stressful than an adult might. Those who are less resilient may turn to unhealthy actions or negative beliefs about themselves to cope with the difficulties encountered in their lives (Smokowski, 1999). For example, in 2007, adolescents accounted for 16% of all arrests for violent crime (Office of Juvenile Justice and Delinquency Prevention, 2007). According to the National Drug Control Policy (2006), as many as 2.1 million adolescents received treatment for substance abuse in 2006. Mental health statistics are important to consider, as well, with 1 in 10 individuals under the age of 18 suffering from a diagnosable mental disorder (National Institute of Mental Health, 2007).

Resilience is a widely studied construct that can be applied to children, adolescents, adults, and the elderly across different ethnic and socio-economic backgrounds (Belgrave et al., 2000; Connell, Spencer, & Aber, 1994; Ripple & Luthar, 1998; Smith & Carlson, 1997; Smokowski, Reynolds, & Bezruczko, 1999; Waller et al., 2003). Generally speaking, resilience can be defined as positively coping with stressful events (Smokowski et al., 1999), or adaptive coping in the face of multiple risk factors (Waller et al., 2003). The various components of resilience can also be thought of having a “buffering” effect between risk factors and negative life outcomes. The concept of resilience has played a large role in

influencing the field of psychology to move away from studying the negative outcomes that some individuals experience (Blum, 1998). This is evidenced by the rise of positive psychology, a recently developed branch of psychology that focuses on individual strengths that enable individuals to live successfully. Research on resilience focuses on those individuals who have overcome difficult life circumstances and have become successful, as well as what factors promote such adaptive functioning.

To begin, it is important to discuss the difference between the varying definitions of resilience in the literature as well as similar terms that can be confused with resilience. First, I will distinguish between the terms *resilience* and *resiliency*. Often, researchers will use these terms interchangeably, while some define a difference between the two terms. To illustrate, Shannon et al. (2007) defined resilience as the adaptive interactive processes between a person and his or her environment, while resiliency refers to specific internal attributes or personality traits that one possesses. For the purposes of this study, the term resilience will be used because the proposed model being developed will help to identify resilient individuals, or those who have not only the internal resources to adaptively interact with their environment, but also the external resources, even as stressors or difficult circumstances are encountered. The model focuses more on the success of individuals in navigating their environments and the resources that help them to cope successfully with difficult situations rather than solely focusing on personality traits.

The term *hardiness* is also often confused with resilience and discussed by researchers who examine resilience. The concepts are similar but there are some difference between hardiness and resilience that should be delineated. First, hardiness is largely focused on the individual's ability to face challenges (O'Neal, 1999). This implies a focus on an

internal locus of control and may not always consider external supports and/or barriers. Due to this lack of focus on external factors that play a role in one's successful coping, hardiness does not seem to encompass the entire construct the current study is trying to examine.

Therefore, the term resilience will be used as opposed to hardiness. For the purposes of the present study, the term resilience will refer to the *propensity for resilience* or the likelihood that one will develop the qualities of resilience and learn to successfully cope with difficult life circumstances and stressful events.

The goal of the present study is to develop a model that will provide a framework for measuring resilience in individuals, specifically in adolescents. The National Longitudinal Survey of Youth (Add Health) database will be utilized to complete this study. The Add Health project began in response to a mandate from Congress regarding a need for an increase in funding of research on adolescents. It is widely considered the most comprehensive longitudinal survey of adolescents that has been completed to date (Harris et al., 2009). This resource was chosen because it provides a large and nationally representative sample of adolescents. It includes in-depth information on adolescents' health and risk behaviors, family and peer relationships, romantic relationships, and personality traits, as well as information on each adolescent's school, neighborhood, and community. The breadth and depth of this database will provide information on the environments and characteristics of individuals that are thought to promote resilience.

Only one study utilizing this data set focused specifically on the development of a resilience scale or model (McKnight & Loper, 2002). One of these studies (Aronowitz & Morrison-Beedy, 2004) focused on avoidance of certain risky behaviors (e.g. substance use, delinquency, violence) to define resilience rather than the presence of internal and external

factors that can contribute to the development of resilience. Instead of using a specific model to measure resilience, some researchers have been using single questions regarding risk factors or specific types of outcomes in order to determine how resilient one is (Blum, 1998; Smokowski et al., 1999; Wagnild & Young, 1993). The development of a resilience model will not only be helpful for the thousands of researchers who use the Add Health database, but it can also be used in conjunction with other studies to examine resilience and perhaps develop a scale that focuses on measuring resilience.

As much of the previous literature shows, there are both internal and external factors that are important to consider when examining resilience. Determining resilience in an individual involves certain internal characteristics as well as elements in the environment. These internal characteristics and environmental factors are referred to as *protective factors*. Protective factors can include individual traits such as self-esteem (Lansford et al., 2006; Smith & Carlson, 1997), intelligence (Everall, Altrows, & Paulson, 2006; Smokowski et al., 1999), internal locus of control (Everall et al., 2006), insight (Smith & Carlson, 1997; Smokowski, Reynolds, & Bezruczko, 1999), social competence and connectedness (Bender, Thompson, McManus, Lantry, & Flynn, 2007; Everall et al., 2006; Oliver, Collin, Burns, & Nicholas, 2006; Valentine & Feinauer, 1993), and temperament (Smith & Carlson, 1997; Smokowski et al., 1999). Other internal qualities such as optimism, future goals, perseverance, determination, motivation, learning from the behavior of others (Smokowski et al., 1999), and having past mastery experiences, or memory of previous achievements were found to play a role in the presence of resilience (Bender et al., 2007). Many of these internal factors such as belonging and self concept are described as having a buffering or protective effect against negative outcomes (Anderman, 2002).

Psychological interventions, such as group therapy or psycho-educational program, that focus specifically on an adolescent's gender and/or ethnic group can also lead to increased resilience (Belgrave et al., 2000). Spirituality and/or religiosity are also often cited as important protective factors and components of the development of resilience (Bogar & Hulse-Killacky, 2006; Cook, 2000; Haight, 1998; Windham et al., 2005). Regnerus (2003) referred specifically to substance abuse and how resilience can help young people overcome growing up with a parent who is a substance abuser. Religion can provide a connection to the larger community, act as a buffer from feelings of hopelessness and meaninglessness, foster a strong sense of right and wrong, and build supportive and caring relationships with family and other adults (Cook, 2000; Haight, 1998; Windham et al., 2005). These religious ties can be especially powerful in African American and Latino/a communities (Cook, 2000).

External protective factors are also important in identifying resilience. These can include such things as family support, guidance, participation in extracurricular activities, and the outside influence of other adults, such as teachers or religious figures (Blum, 1998; Cook, 2000; Everall et al.; Smith & Carlson, 1997; Washington, 2008; Windham, Hooper, & Hudson, 2005). Another external factor that was found to be important involved previous exposure to stressors or risk factors. When addressing adolescent victimization, it was found that those adolescents who had witnessed some violence or family conflict were less vulnerable to victimization (Christiansen & Evans, 2005). Just as with internal factors of resilience, many of these external factors such as supportive relationships, strong ties to parents, and positive role models (Aronowitz & Morrion-Beedy, 2004; Crosnoe & Elder, 2004; Everall et al., 2006; Wight et al., 2005) are also described as having a buffering effect against negative outcomes.

As mentioned above, family involvement and support are vital components in helping to develop resilience. Family members may play a role as either a protective or a risk factor. For example, a study by Waller et al. (2003) found that adolescents may find it harder to resist peer pressure to use a substance from a family member than from another peer who is not related. Additionally, the researchers found that these family members can strongly influence adolescent choices not to experiment with substances. The generalizability of the Waller et al.'s findings should be taken with caution, because their sample included only Native Americans. Moreover, Rodgers and Rose (2001) found that if a student is not feeling supported by her parents, a strong relationship with a teacher can provide that support and continue to influence the student's resilience.

The current study will focus on the aforementioned internal strengths and external protective factors that help an individual cope with stressful circumstances. A study by McKnight and Loper (2002) chose to focus on parent involvement, school involvement, substance abstinence, and other items, such as importance of religion and feelings of belonging. These concepts of resilience will be used in the current study, which will also examine self-esteem, personal goals, belonging at home and at school, relationships with family, peers, and other adults, and problem solving abilities as potential indicators of resilience.

The bulk of the literature on resilience research focuses on the healthy development and success of adolescents. However, when studying resilience, it is also important to consider exposure to risk factors or difficult life circumstances. Exposure to certain risk factors and experiencing protective factors influence how resilient an individual is (Blum, 1998; Everall, Altrows, & Paulson, 2006; Smith & Carlson, 1997; Smokowski et al., 2000).

Some researchers even believe that experiencing adversity is a necessary precursor for the development of resilience (Shannon, Beauchaine, Brenner, Neuhaus, & Gatzke-Kopp, 2007). *Risk factors* can be characteristics of an individual, family, or the environment. It has been found that cumulative risk factors can have a more negative outcome on a child than any one single risk factor (Smith & Carlson, 1997).

Some examples of risk factors include pressure to abuse substances (Waller et al., 2003), previous exposure to violence (Christiansen & Evans, 2005), and lack of resources or parental support (Smokowski et al., 2000). Risk factors also occur in academic settings. Being over age for one's grade, freshmen-year grades, teacher ratings, and absences are all strongly related to dropout rates with absences found to be the most powerful predictor (Ripple & Luthar, 1999). Risk factors and related stressful events can lead to more negative outcomes for individuals while the various perceptions of these factors and stressful events can influence how it is viewed (Smith & Carlson, 1997; Washington, 2008).

Such differences in the perceptions of risk factors have been noted in the extant literature. For example, Smith and Carlson (1997) focused on how certain stressful events may be viewed differently by different age groups. In adolescence, even minor disagreements with parents can be perceived as incredibly stressful; however, in a different age group, this event may not be perceived as stressful at all. Blum (1998) suggested that this difference in perceptions by stating that the perception of stressful events varies from person to person according to cognitive ability, maturity, and emotional resources. Stress can also be exacerbated if a particular event was experienced alone instead of as a part of a group (Blum, 1998).

Not only is resilience an important construct to study because of its focus on strengths and helping individuals to adapt, but it also has been found to help individuals cope with more specific difficult life circumstances. For example, Connor, Davidson, and Lee (2003) found that resilience helps adults cope with trauma more effectively. More specifically, higher levels of anger in relationship to a traumatic experience led to greater emotional distress and lower overall health status (Connor et al., 2003). Other findings also indicated *hardiness* (a construct related to resilience) had an inverse relationship with stress, depression, and anger (Maddi, Brow, Khoshaba, & Vaitkus, 2006). In addition, hardiness was also found to be positively related to coping and social support (Blum, 1998). In a study involving children and adolescents who witnessed homicide, resilience was also found to be key in learning from and moving past the experience (Levy & Wall, 2000).

Resilience and its relationship to the regulation of emotions has also been reported in the literature (Eisenberg et al., 1997; Eisenberg et al., 2004). Specifically, resiliency was found to mediate the level of socially appropriate behavior and emotional control. In a study by Eisenberg et al., the relationships among resilience, emotional regulation, and socially appropriate behavior were examined, and socially appropriate behavior was identified as both prosocial and socially constructive. Participants were found to be more socially appropriate if they were more capable of regulating their emotions and also had higher levels of resiliency. One specific analysis in Eisenberg et al. examined levels of emotional intensity. Higher levels of negative emotions, such as anxiety and anger, defined emotional intensity. Those participants with higher levels of emotional intensity were less socially appropriate, which also indicated lower levels of resilience and emotional regulation.

In a similar study, it was found that effortful control of emotions, as well as impulsivity, were related to resiliency and problem behaviors (Eisenberg et al., 2004). Specifically, resiliency was negatively correlated with parent and teacher reports of problem behaviors, both internalizing and externalizing. In addition, impulsivity was found to be positively correlated with externalizing and internalizing problems. Interestingly, Eisenberg et al. also found that resiliency mediated the relationship between impulsivity and effortful control. Therefore, children in this study who had low effortful control were also found to have low levels of resilience as well as more difficulty managing negative emotional states. Effortful control was also found to be positively related to resilience.

Resilience is not a static trait or something that one has or does not have. It is viewed more as a continual process, an interaction between person and environment that can protect one against psychological and physical trauma (Blum, 1998; Bogar & Hulse-Killacky, 2006). Individuals can be taught how to become more resilient and cope effectively in the case of stressors and/or trauma. Burnham (2009) found that resilience helped students to feel less traumatized by stressful events, and urged resilience to be identified in and taught to adolescents in order to help them face adversity. Burnham suggested using resilience in a proactive manner to help adolescents navigate life more successfully. Such an approach involves a focus on strengths and hope rather than the typical problems in adolescence. In the light of recent traumatic events affecting adolescents such as widely publicized school shootings and higher rates of substance use and mental health problems, resilience seems especially important. If resilience can be more accurately identified and understood, this knowledge can be utilized to teach adolescents how to interact with the world around them in a more resilient and adaptive way.

CHAPTER 2

LITERATURE REVIEW

The development and fostering of resilience from a young age can produce many positive effects. If individuals can learn at a young age that they have support systems and internal qualities that can help them cope with difficult situations, these could be useful tools for years to come. Effective coping skills can be used throughout one's life, and can protect one from life's stressors and from facing mental health and/or substance use problems. Burnham (2009) described resilience as a potentially proactive way of preventing such difficulties and providing adolescents with a way to successfully navigate their world. The goal of the proposed study is to develop and evaluate a model that can measure resilience in adolescents. Many scales and models are developed to measure some type of mental health disorder or vulnerability in human beings. The study of resilience is based on strengths a person has and how difficulties in life can be overcome. It is this emphasis on strengths and positive assets that will be the focus of this model, rather than weakness or vulnerability.

As indicated previously, resilience is often discussed as a trait or construct that is developed throughout one's life or after a traumatic or stressful event in one's life. However, when looking at internal and external parts of resilience, these are factors that help to identify resilience in individuals. These indicators or predictors of resilience are what will be measured in this study. While resilience can be developed as a part of one's childhood or adolescence, it is also a consistent trait that can be measured once it has been developed in an individual.

This chapter will define the concept of resilience and review research on the construct, as well as delineate between the internal traits and external factors that serve to

comprise resilience in an individual. Risk factors that are commonly studied as a part of resilience research will also be reviewed. Finally, the existing resilience scales will be discussed and critiqued and compared to the resilience model that is being developed in the current study. Support will be provided for the development of such a model and for the purposes of the model.

Resilience

As discussed in the introduction, there are multiple definitions for resilience and many closely related terms. Resilience is defined in many ways by many different researchers. Bogar and Hulse-Killacky (2006) cited multiple sources that defined resilience as a combination of external assets and internal personality traits that serve to act as a buffer between individuals and difficult life circumstances, and help individuals to cope effectively with such circumstances. Further, resilience is the ability of a person to “bounce back” after trauma and lead a productive and satisfying life. Many researchers view resilience as more of a labile constructed affected by multiple factors rather than something that one “just has” (Bogar and Hulse-Killacky, 2006; Everall et al., 2006). It is also often viewed as having a buffering effect between risk factors and negative outcomes (Anderman, 2002; Aronowitz & Morrison-Beedy, 2004; Crosnoe & Elder, 2004; Everall et al., 2006; Wight et al., 2005), as discussed in the introduction.

In related literature, Benson, Galbraith, and Espeland (1998) refer to developmental assets as playing a role in helping adolescents to succeed. These assets have a cumulative effect: the more assets one has, the stronger the buffer and the more likely they are to succeed (Howard, Dryden, & Johnson, 1999). They also serve in the prevention of risky behaviors in adolescents, such as substance use/abuse, violence, sexual activity, problems in school,

depression, and suicide (Benson et al., 1998). Individuals who possess a number of these assets could be deemed resilient. Additionally, resilience is a concept that can be fostered in adolescents despite race, ethnicity, gender, social class, geographic location, etc. (Resnick, 2000).

Lack of resilience in adolescents has been associated with difficulties such as internalizing problems, impulsivity, and poor reaction control (Martel et al., 2007). In addition to acting as a buffer against internalizing problems, Shannon et al. (2007) found that resilience protects against both internalizing and externalizing behavior patterns as well as negative emotionality. In turn, higher levels of resilience in young children may indicate less likelihood of development of behavior difficulties, such as conduct disorder and depression (Shannon et al.). In terms of mental and physical health, higher levels of resilience have also been associated with lower blood pressure, less risk for heart disease other illnesses, and fewer signs of psychopathology (Maddi, Brow, Khoshaba, & Vaitkus, 2006).

Many sources agree that facing some type of adversity is necessary for resilience to develop (Shannon et al., 2007). Everall et al. (2007) follow this same idea by proposing that individuals do not possess resilience as an internal trait, but gain or increase their level of resilience by overcoming various types of adversity. Resilience may also depend on the context in which one experiences hardships (Washington, 2008), and may develop because one can frame experiences in a more positive context rather than with a defeatist attitude.

Separate Measurement of Internal and External Factors

Many researchers identify separate internal and external factors that contribute to resilience. The proposed study will also separate these two differing influences on resilience in the measure as well as the analysis. It has often been described as including environmental

characteristics as well as personality traits (Blum, 1998b; Garmezy, 1985). For example, when researching female survivors of sexual abuse, Valentine and Feinauer (1993) found both internal and external factors as a part of the underlying themes of the resilience of these individuals. In the literature regarding developmental assets, the difference between external and internal assets is also clearly delineated. Personality characteristics are identified separately from assets external to an individual like family support and positive role models (Benson et al., 1998). Shannon et al. (2007) more broadly define these internal and external areas of resilience as biological and psychological versus social and family processes, respectively.

Similarly, in a study of female adolescents with a history of suicidal behavior, characteristics of resilience were divided into three categories including individual, family, and external or community factors (Everall et al., 2006). These separate categories, however, were found to be strongly related to each other. As changes or improvements were made in one domain of resilience, increases in resources also occurred in the other two domains (Everall et al.). Many other authors also divided aspects of resilience into the categories of individual, family, and community/external factors (Blum, 1998; Howard et al., 1999; Levy & Wall, 2000; Smith & Carlson, 1997). The increase of resilience in one area had a “snowball effect” on resilience in general within the individual. In a separate study concerning female adolescents, Washington (2008) also found support for both internal and external factors influencing resilience.

In a study on homeless teenagers, support for multiple internal factors was found (Bender, Thompson, McManus, Lantry, & Flynn, 2007). However, social skills and a social support network were also emphasized as important external factors for these participants.

One research project looking at familial and temperament predictors of resilience recommended examining social adjustment, academic achievement, and psychological well-being when studying resilience (Shannon et al., 2007). These recommendations include both internal and external processes involved in resilience. A study of promoting resilience in Australian youth heavily emphasized external resources as important in this process, such as social connectedness and competency, as well as adult support (Oliver, Collins, Burns, & Nicholas, 2006). However, the internal factor of cognitive competence was also found to be important.

Religion and spirituality are both often cited as having strong influences on how resilient an individual is (Cook, 2000; Regnerus, 2003; Windham, Hooper, & Hudson, 2005). Though these concepts seem closely related, they also represent both internal and external factors of resilience. Kelly (1995) defines *spirituality* as one's belief and sense of connectedness to the universe, while *religion* is often defined as the ritual expression of spirituality based on a larger creed or institution. Furthermore, spirituality can be defined as more of an internal characteristic of faith in some sort of higher power, while religion can be considered more external. Being a member of a religious group provides a support system as well as opportunities to become involved in community service, and, in the case of adolescents, to develop positive relationships with both adults and peers (Cook, 2000). These two factors of resilience will be defined further later in this chapter.

As can be seen from the literature described above, there is a division between researchers who divide resilience into two separate factors, internal and external, and those who break up the factors into three subcategories, individual, family, and external/community. In the proposed study, I focus on two subcomponents of resilience,

internal and external factors, because most of the literature focuses on these factors rather than the aforementioned three sub-categories. One's family is something that is outside of oneself and so should be considered external. Additionally, other external factors, such as supportive and caring teachers, can take the place of missing family factors that play a role in resilience (Crosnoe & Elder, 2004). This will be demonstrated in later paragraphs. For these reasons, family has been kept as an external factor rather than its own separate category.

Just as it is necessary to discuss this model with three subcategories, it is also important to examine the idea that resilience could also be presented as a single factor model. One could argue that resilience is not made up of internal and external factors, but rather that external factors are a product of one's perception of the resources to which they have access. For example, school belonging is considered by many to be a protective factor because an adolescent can feel a sense of acceptance from peers and school could be a safe haven from a hectic home environment. However, it could be argued that one's feeling of belonging to one's school is based solely on the individual's perception and, therefore, is an internal rather than external factor. This could be said about each of the external factors described as a part of this model. However, as demonstrated in previous paragraph, this view of a single factor model of resilience is not discussed in the majority of research in resilience.

Internal Factors

In an extensive examination of developmental assets that lead to successful coping in adolescents, internal assets include commitment to learning, positive values such as caring, equality/social justice, integrity, honesty, responsibility, and restraint, social competencies, conflict resolution skills, positive identity with a sense of purpose, and an optimistic view of the future (Benson et al., 1998). To specifically address the aims of this study, the paragraphs

that follow will focus solely on the constructs used in the proposed model. These are constructs that appear frequently in the literature as well as in the Add Health database. Due to the frequent findings of the proposed factors as important components of resilience, it is unlikely that not including other less frequently supported components of resilience will compromise the overall validity of the scale scores.

Intelligence

In a review of the role of resiliency in the healthy development of adolescents, Blum (1998) identified higher intelligence as important in this process. Smith and Carlson (1997) and Smokowski et al. (1999) completed a similar review and identified intelligence as an important component of resilience as well. When studying factors that helped adolescent females move past feelings of suicide, higher IQ was found to be a contributing factor to the resilience of the participants (Everall et al., 2006). Bender et al. (2007) found similar results when investigating what helped homeless teens to survive on the streets and remain resilient.

Intrinsic Motivation

Benson et al. (1998) emphasized intrinsic motivation as important in many areas for adolescents, especially in terms of academic achievement. When studying homeless teens, Bender et al. (2007) found motivation to be important to survival on the streets and the overall resilience of individuals. The authors defined this construct as a personal strength and source of inspiration and measured the construct using qualitative interviewing techniques. Motivation is also viewed as an incentive to improve one's situation (Bender et al., 2007). This particular construct is not frequently cited in the resilience literature. However, the ideas of optimism, future goals, perseverance, and determination have all been linked to resilience,

as described earlier. Each of these constructs also emphasizes personal strength and a desire to improve one's life. Intrinsic motivation is a broader way to encompass all of these items.

Problem Solving Ability

Everall et al. (2006) found that suicidal female adolescents found problem solving skills as a component of resilience and adaptive coping. The ability to face problems head on and use problem-focused coping strategies is important in healthy and successful adolescent development. Rather than avoiding problems, individuals can learn to cope with them, reach out for support, and think creatively (Everall et al., 2006). The knowledge is also developed that one *can* solve problems that are presented. This is empowering and can improve self-esteem.

Self-esteem

In Blum's (1998) study, higher levels of self-esteem were consistently identified as an important part of resilience. Smith and Carlson (1997) completed a similar review and also identified self-esteem as a reoccurring cited component of resilience. Belgrave et al. (2000) completed a study on effective intervention strategies for developing resilience in African American female adolescent youth. Among other factors, higher levels of self-esteem in these young women were found to be associated with higher levels of resilience. Research focusing on sexual abuse survivors as well as adolescent females recovering from suicidal thoughts or gestures also found positive self-esteem as an important component to resilience (Bogar & Hulse-Killacky, 2006; Everall et al., 2006).

When studying the effects of physical maltreatment on adolescents, self-esteem, among other internal factors, was found to significantly increase resilience and decrease the internalizing and externalizing behaviors that can occur due to abuse (Lansford et al., 2006).

Furthermore, these internal factors were found to contribute to resilience even more than certain external factors, such as positive relationships with adults outside of the family. Self-esteem and a more positive self-concept are part of a belief in one's ability to be successful and overcome difficult life circumstances. In other words, self-esteem contributes to one's belief in one's worthiness to pursue a positive life (Bogar & Hulse-Killacky, 2006).

Personal Goals

Based on a content analysis of qualitative data regarding resilience in disadvantaged youth, it was found that future expectations and goals were important in determining how resilient an individual was (Smokowski et al., 1999). The concept of "creating a future" was also discussed by Everall et al. (2006). This idea implies adolescents develop a sense of hope and optimism in the future and can envision themselves being successful. Self-esteem and confidence can also come about as one begins to set goals and believe in one's ability to attain them.

External Factors

The same review of developmental assets that lead to successful coping in adolescents also identified external assets as key components of resilience (Benson et al., 1998). These include support from the family and other adults, positive communication, caring neighborhood and school environment, empowerment, clear boundaries and expectations from family, school, and one's neighborhood, positive adult role models as well as positive peer influence, and constructive use of time in activities such as youth programs, religious, community service, and other creative activities as well as positive time spent in one's home environment (Benson et al., 1998). As with internal factors, only the external factors used in the proposal will be further explored in the following paragraphs. The factors

included in the model are those discussed most frequently in the literature and those most extensively reviewed. The absence of other less cited factors in the model are not anticipated to affect the overall content validity of the scale scores, because they are less important to the overall construct of resilience.

School Belonging

An adolescent perceiving that they belong and are treated fairly in their school has been shown to be an important component of resilience (Rodgers & Rose, 2001) as well as connected to positive outcomes in the areas of academics, behavior, and psychological health (Anderman, 2003). Belonging can provide a sense of responsibility and bring out individual strengths (Benson, 2007). This can be important in the school setting as well as other social environments. Lacking a sense of belonging in the school environment was also used as an indicator of environmental risk factors in a study by Dubois and Silverthorn (2005) on fostering mentoring relationships and how this is related to adolescents' healthy development.

Neighborhood Belonging

Benson et al. (1998) identified a feeling of belonging to one's neighborhood as an important external asset in adolescents. The literature on developmental assets is similar to that of resilience. It focuses on assets, both internal and external, that help adolescents to not only cope with difficult life circumstances but adapt successfully. Feeling unsafe in one's neighborhood was an environmental risk factor in the DuBois and Silverthorn (2005) study described above. As mentioned previously, a sense of belonging or connectedness is highly related to positive behavioral, psychological, and academic outcomes and just as this is important in an adolescent's school setting, it is important in other social settings (Anderman,

2003). Acceptance by peers has also been found to be related to self-esteem, another component of resilience (Daniels & Leaper, 2006), which further supports the importance of social relationships and connectedness in resilience.

Family Relationships

Lower levels of a sense of belonging in the family emerged as an environmental risk when studying adolescent mentoring relationships and how those play a role in healthy adolescent development (DuBois & Silverthorn, 2005). A study focusing on the resilience and resistance of drug use by Latino/a youth found the role of parents to be a strong force in the success of such prevention (Marsiglia et al., 2002). The authors described parents setting boundaries, participants having a strong bond with parents, and spending time with parents as preventive factors in drug use. While this study solely focused on Latino/a adolescent populations in an urban setting, it still demonstrates the role of parents in the resilience of children in resisting pressure to abuse substances. This study did not focus solely on resilience or use a resilience measure to compare with the outcome measures of the study, and is another example of the use of outcome measures rather than a resilience measure to determine that a participant is resilient or not.

In the Smokowski et al. (1999) review of resilience described earlier, positive relationships with parents, especially mothers, were found to be an important component of resilience. In an article on the successful development and resilience on African American youth, positive support as well as guidance from family members are also components of resilience and promote well being (Hopps et al., 2002). A study on the influence of same generation family members on substance use and resistance in Native American adolescents had mixed findings (Waller et al., 2003). On the one hand, family members, such as cousins

and siblings, had more of an influence in preventing adolescents from using a substance. However, it was also harder for participants to resist the offer of these family members to use drugs or alcohol.

Other Supportive Relationships

Many articles reporting research on resilience have found that only one supportive relationship with an adult outside the family can lead to higher levels of resilience in youth (Belgrave et al., 2000; Smith & Carlson, 1997). In the Marsiglia et al. (2002) study mentioned previously, the researchers also found resilience against drug use to be partially attributable to supportive teachers. Many students in the study described teachers as an additional or even alternative support system to parents when facing decisions about using drugs. In a study examining academic resilience despite a negative home environment, it was found that participants with supportive teachers were likely to have a higher GPA despite lack of parental support (Rodgers & Rose, 2001). This study is also another example of outcome variables (in this case GPA) being used to measure resilience rather than an actual scale. Additionally, the ability to seek assistance and find emotional support outside of the family is also important in resilience. Bogar and Hulse-Killacky (2006) demonstrated this as they analyzed qualitative data gathered from sexual abuse survivors. Participants with caring “non-parents” in their lives were more likely to be resilient (Everall et al., 2006).

Religion

In the review of literature by Smith and Carlson (1997) cited earlier, a belief in a higher power or religious philosophy was also shown to be important in the resilience of an individual. Similarly, Smokowski et al. (1999) described adolescents who have a religious faith of some type as more resilient. Hopps et al. (2002) also identified the opportunity for

youth connect to larger institutions or organizations, such as a church, as an important protective factor against various risk factors. In the Bogar and Hulse-Killacky (2006) study described above, religion emerged as an important component of resilience as they interviewed participants.

While religion and spirituality are often studied and cited as important factors in coping and resilience, it has also been shown that these constructs alone are not necessarily always sufficient by themselves. Connor, Davidson, and Lee (2003) found that participants recovering from violent trauma had poorer outcomes associated with higher levels of spiritual belief. These findings could indicate that spirituality or religiosity alone is not enough to cope successfully with a traumatic event, but may be important components of resilience. Maddi et al. (2006) further supported these findings with their article examining relationships among depression, anger, hardiness (a concept similar to resilience), and religiousness. Findings in this study indicate that religiosity was inversely related to depression and anger in the absence of hardiness. However, when hardiness was high, this relationship was no longer present. Therefore, hardiness has an overall stronger inverse relationship to depression and anger than religiosity alone.

Haight (1998) described religion as a powerful force in an adolescent's life. Not only are adolescents involved with religious organizations more resilient, but involvement in some type of religious activity is also associated with higher levels of self-worth and pride, as well as a sense of belonging. Additionally, at least in African American churches, children and adolescents can learn more about their cultural heritage and feel proud of their history (Haight, 1998). Involvement in churches also leads to relationships with a larger community as well as supportive adults outside of the family (Haight, 1998). As these supportive

relationships are also components of resilience, one can see why religion and spirituality are an important component of resilience.

By the same token, Cook's (2000) investigation of the role of religion in the lives of inner city youth found a similar relationship to resilience, and in many findings were similar to those described by Haight (1998). Furthermore, Cook described the religious community as fostering positive identity, as well as a standard of behavior for adolescents. Religious youth are able to better distinguish between right and wrong. They are also provided with a place to go after school that may help prevent involvement in risky behaviors. Windham et al. (2005) found similar positive effects of religion, and also found it could buffer against feelings of hopelessness and maladaptive behaviors, such as delinquency and drug use. Regnerus (2003) took these findings one step further, and found that in homes where an adolescent's parents were abusing drugs or alcohol, religion was the most powerful protective factors against the potential adverse effects from this type of environment.

Risk Factors

Risk factors are often discussed in conjunction with resilience. Often, they are defined as conditions that can interfere with successful development (Blum, 1998). These are important in the study of resilience because resilience often serves as a protective force or buffer against these factors. Resilience helps individuals to adapt and live successfully despite experiencing risk factors. Like resilience, risk factors can also be divided into individual, family, and environmental characteristics (Blum, 1998; Smith & Carlson, 1997). These factors often interfere with an individual's psychosocial development (Hopps et al., 2002). Blum (1998) made a different distinction when defining risk factors, and looked at macro level factors as well as micro level factors. These included housing conditions, social

support networks, and level of crime as macro factors. Micro factors included personality, cognitive abilities, poor academic achievement, and poor social relationships.

Hopps et al. (2002) defined some of these risk factors as chronic illness or disability, or affiliating with peers who use drugs. More broadly, some areas that are consistently associated with poor future outcomes are substandard academic achievement and poor social relationships (Hopps et al., 2002). Witnessing violence, either domestic or in the community, is also a commonly studied risk factor (Christiansen & Evans, 2005). In examining resilience in adolescents who had been victimized in some way, Christiansen and Evans also identified a category of “risky behaviors” that tend to predict unsuccessful outcomes for adolescents. These behaviors included things like delinquency, being involved in a physical fight, using a weapon to threaten or assault someone, and alcohol or drug use. Some examples of delinquent behavior were also given, such as painting graffiti, participating in vandalism, and stealing.

Waller et al. (2003) used substance use in Native American adolescents as the only risk factor in the study. Higher levels of substance use were associated with lower levels of resilience in this study. The youth in the study were also considered to have a higher risk of being less resilient if they had same-generation family members pressuring them to use substances. Another study used violent trauma and the distress experienced due to such events as the outcome measure of another resilience scale (Connor et al., 2003). Participants in this study were found to be more resilient if they had a significant reduction in post-traumatic stress disorder symptoms, as well as an increase in mental and physical health outcomes. Marsiglia et al. (2002) focused on adolescent drug use as a risk factor and outcome measure to determine resilience. Participants in this qualitative study identified

multiple factors that put them at risk for using drugs, such as a drug infested neighborhood, lack of attachment to the school environment, and lack of positive interaction with parents.

Existing Resilience Scales

Despite decades of research in the field of resilience, after an extensive review of the literature using the PsycINFO database and the keywords *resilience*, *resiliency*, *hardiness*, *measures*, and *scale development*, very few scales measuring individual resilience were found. As stated previously, resilience researchers often use outcome measures such as lack of involvement in risky behaviors or academic achievement as evidence of resilience rather than utilizing an actual scale (Aronowitz & Morrison-Beedy, 2004; Blum, 1998; Smokowski et al., 1999; Wagnild & Young, 1993). Additionally, there are a handful of scales that measure the concept of hardiness. While this concept is similar to that of resilience, there are also some important differences. As mentioned previously, hardiness is largely focused on the individual and their ability to face challenges and an internal locus of control (O'Neal, 1999).

The Resilience Scale (RS) was developed in the early 1990s in response to the lack of measuring resilience and the use of adaptive outcomes to prove resilience (Wagnild & Young, 1993). The RS was developed based on a qualitative study of women who had managed to successfully adapt after a trying life event. From interviewing these women, five underlying themes were developed as the basis for this 25-item scale: Equanimity, Perseverance, Self-reliance, Existential aloneness, and Meaningfulness. The authors did not specify particular items being solely related to any of the five themes. The scale was piloted using a very small sample of 39 nursing students. Cronbach's alpha to measure internal consistency was used in this pilot study and found to be .89. The RS has also been shown

useful with other populations including caregiver's of spouses with Alzheimer's disease, public housing residents, first-time mothers returning to work, postpartum and pregnant women, and graduate students. Statistics on internal consistency in these studies ranged from .76 to .90, which are satisfactory according to Wagnild and Young.

Wagnild and Young (1993) completed a principle components factor analysis using a oblimin rotation to explore the structure of the RS with the sample of nursing students. The factor solution indicated one primary factor that explained a total of 38% of the overall variance. Factor loadings for the items ranged from .30 to .76 with 23 of the 25 items ranging from .45 to .76. Correlations between each factor score and the overall RS score was measured with Cronbach's alpha at .99.

After these smaller studies were completed, Wagnild and Young (1993) felt it necessary to use the RS in a larger setting to produce more evidence for the validity and reliability of the scale. This study focused on 1500 older adults in the Northwest region of the United States. With this larger sample, the scale continued to show reliability. Evidence for concurrent validity was also provided by significant correlations of the RS with measures of depression, health, life satisfaction, and morale, which have all been connected to resilience in the literature. More specifically, the RS was inversely correlated with depression ($r = -.36$) but positively correlated with measures of health, life satisfaction, and morale with Cronbach's alpha ranging from .40 to .67.

While these findings are promising, the RS also has some limitations. Despite some use with populations, such as first-time mothers and graduate students, it has been used mostly with women and older adults. This decreases the generalizability of this scale to other populations. It also mainly focuses on internal characteristics while resilience, as has been

shown in previous paragraphs, is also largely dependent on environmental factors.

Concerning the proposed study, it is also not applicable to adolescents, or at least there is no evidence of this. It has not been used with this population and was devised based on interviews with undergraduates.

Jew, Green, and Kroger (1999) also developed a scale to measure resilience. As with the Wagnild and Young (1993) scale, this scale was also mostly focused on internal characteristics of an individual. Therefore, the Jew et al.'s scale was focused mostly on internal factors rather than factors outside of the individual. It was described as focused on more of a cognitive theory of resilience that identified 12 skills and abilities used by resilient individuals to manage stressful events. These include rapid response to danger, precocious maturity, disassociation of affect, information seeking, seeking out and forming social relationships for survival, positive future anticipation, decisive risk-taking, believing one is loved, idealization of an aggressor's competence, ability to cognitively restructure painful events, altruism, and optimism/hope (O'Neal, 1999).

An exploratory principle components analysis with a varimax rotation was completed to examine the factor structure of the Jew et al. (1999) scale. The authors selected a four-factor solution as providing the most clarity and it explained 34% of the overall variance of the scale. A total of nine items were deleted from the scale because they detracted from overall internal consistency of the scale (Jew et al., 1999). Specific factor loadings and item-total correlations were not provided in the article discussing the development and validation of the scale.

The original authors of this 35-item measure completed four different studies in order to provide evidence for validity and reliability of the scale. Each of these studies used

adolescents as the norming population and included groups of 9th-grade students, 7th-12th grade students, and adolescents hospitalized in a psychiatric treatment facility. Four subscales comprise this measure, including Optimism, Future Orientation, Belief in Others, and Independence. These subscales were found to have low to moderate significant correlations with measures of self-perception and internal locus of control with Cronbach's alpha ranging from .66 to .82. No relationship was found between any of the subscales and a measure of adaptive behavior (Jew et al., 1999), which could be considered a weakness, because resilience is often related to adaptive behaviors.

Adequate internal consistency was shown in each of these studies. The measure was also found to be able to discriminate between the inpatient and outpatient populations as well as between at-risk and non-risk populations. This shows some usefulness with adolescent populations. However, the original samples used for validity evidence were from schools that were largely Caucasian and in the Western part of the United States. Mostly 9th-graders were used, and those of different grades were much smaller in sample size. Therefore, results may not generalize to the rest of the United States or students younger than 7th-grade. One strength of the proposed scale over the Jew et al. (1999) scale is the use of a broad sample. The proposed scale will also focus on external factors in an adolescent's life that contribute to resilience. However, Jew et al. does provide further support for the use of future orientation items, whereas, this support was not found very often in the previous literature review.

A third scale, the Connor-Davidson Resilience Scale (CD-RISC) was developed more recently than the previously discussed scales. This 25-item assessment was developed in response to the lack of a widely used resilience scale (Connor & Davidson, 2003). The authors also cited the fact that in a recent textbook of psychiatric measures, the American

Psychiatric Association did not list any measures of resilience. As with the previously discussed scales, this measure focuses, for the most part, on individual characteristics and all but ignores external assets or resources to which an individual has access. An exploratory factor analysis was completed using an orthomax rotation. Eigenvalues revealed five underlying factors of the scale. Item total correlations ranged from .30 to .69.

In the sample used to standardize this assessment, a total of 827 participants were used that included both clinical and non-clinical populations. Internal consistency was found to be good in this norming sample with Cronbach's alpha at a value of .89. Test-retest reliability was also measured and found to be fairly high with a value of .87. Convergent and divergent validity were measured using both clinical and non-clinical participants. For the combined group, the CD-RISC was shown to be negatively correlated with measures of perceived stress and vulnerability to stress (Connor & Davidson, 2003). These findings indicate that higher levels of resilience, as measured by the CD-RISC, correspond with less perceived stress and less overall vulnerability to stress. Using the clinical sample, Connor and Davidson also found that the CD-RISC was positively correlated with the Kobasa hardiness measure. Hardiness is a construct similar to resilience, and this finding provides evidence of concurrent validity of CD-RISC scores. Evidence was also found supporting the idea that, as clinical improvements in an inpatient setting occur, scores on the CD-RISC increase.

According to Connor and Davidson (2003), the CD-RISC has higher internal consistency data than previous scales discussed, and also has shown that it is reliable over time. More than other scales discussed, it also shows evidence for both convergent and divergent validity. However, the CD-RISC focused on mostly Caucasian participants and

disproportionate number of females to males. The norming sample also had a mean age of approximately 43 years old. The sample was also collected from the North Carolina area. These facts limit the generalizability of this particular scale.

Advantages of Structural Equation Modeling (SEM)

Structural equation modeling, or SEM, and a few of its components will be used to complete the analyses for this study. SEM is made up of a set of related statistical procedures (Kline, 2005). There are a few characteristics of SEM that have led to my choice to use SEM for this project. To begin, SEM uses an a priori method. Therefore, hypotheses and models that go into using SEM must be based on prior research and/or a theory about how a model should work (Kline, 2005). This allows the researcher to run statistical analysis rather than multiple tests. Results apply to an entire model, or the big picture. This also increases the validity of the findings by increasing the power of the analysis.

Using a model rather than conducting multiple null hypothesis tests decreases the probability of Type I error, or the possibility of not finding significant results when they do, in fact, exist. Another strength is that SEM requires the testing of alternative models. This not only can serve to further strengthen the argument for a certain model, it can also rule out other similar models, which contributes more to theory than simple tests of significance. The final consideration for SEM is its ability to account for measurement error. Rather than providing one error term, as in regression, SEM partials error out as coming from different sources. This provides more validity and greater power for the data because we can see how much error is associated with each endogenous term.

Statement of Purpose

The goal of the present study is to develop and validate a model that will provide a framework for measuring resilience in adolescents. The National Longitudinal Survey of Youth (Add Health) database will be utilized to complete this study. Rather than continuing to study resilience using one or two item outcome measures, the development of this model will assist researchers in studying resilience as a focus on individual strengths and optimism. It will move away from the current trend of measuring resilience by looking at a lack of engagement in risky behaviors, to looking at resilience as a set of internal qualities and external protective factors. The present study will also examine the relationship between the proposed model of resilience, risk factors, and negative outcomes for individuals. The present study hopes to show that resilience acts as a buffer between risk factors and negative outcomes in adolescents. Additionally, very few models have been developed for the study of resilience and none specifically for research with adolescents. The present study will serve to fill this gap in the current resilience literature. The developed model can also be used in the future to develop more specific scales to measure resilience in adolescents as well as in other populations.

Research Hypotheses

1. A valid model of global resilience will have two dimensions of internal and external resilience.
2. Intelligence, intrinsic motivation, problem solving ability, self esteem, and personal goals will each be sub dimensions of an internal resilience dimension (see Figure 1).
3. School belonging, neighborhood belonging, relationships with parents and other

family members, other supportive relationships, and religion will each be dimensions of an external resilience dimension. (see Figure 1).

4. Internal and external dimensions will be significantly related to one another.
5. The model of internal and external dimensions would be a better representation of resilience than alternative models (See Figures 2 & 3) including one alternative model with separate individual, family, and external dimensions and one alternative model with resilience as a single dimension
6. Results of the proposed model will be shown to be consistent across between Wave I and Wave II participants.
7. Results of the proposed model will be shown to be consistent across groups of both early (ages 12 to 14) and middle (ages 15 to 18) adolescence, ages of 12 and 14 (early adolescence) and 15-18 (middle adolescence) will be nonsignificant.

Research Questions

1. Is there evidence for a model with a global dimension of resilience with two sub dimensions of internal and external resilience?
2. Will resilience items and questions regarding potential negative outcomes experienced by participants after controlling for pre-existing factors including ethnicity, disability status, marital status of parents, etc (See Figure 4 on page 35) be significantly related?

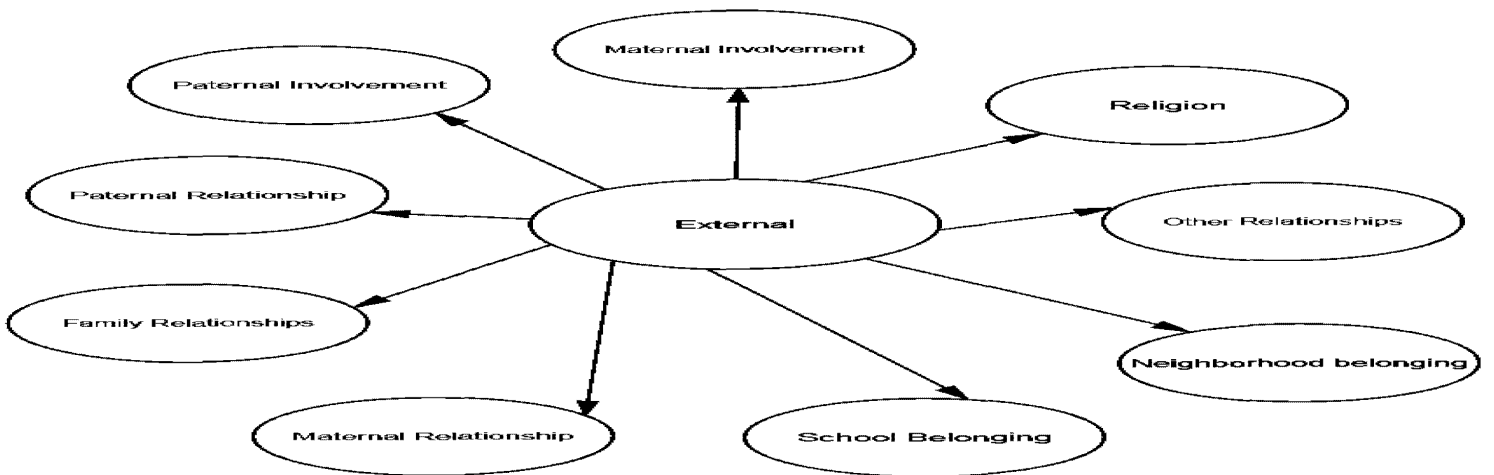
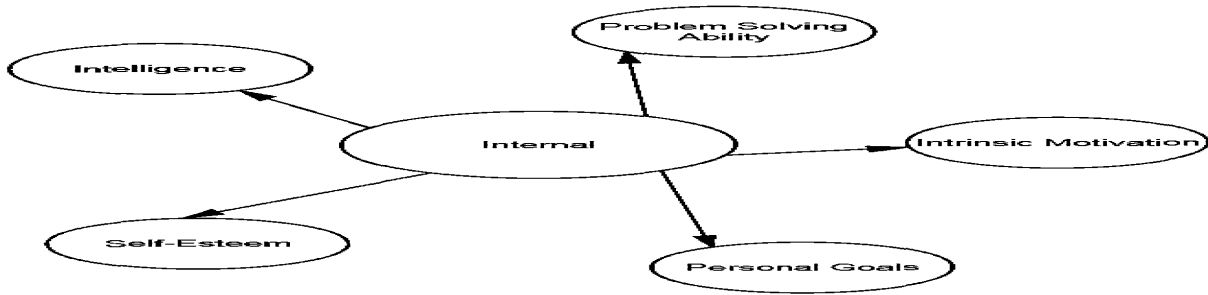


Figure 1. Internal and External Sub Dimensions

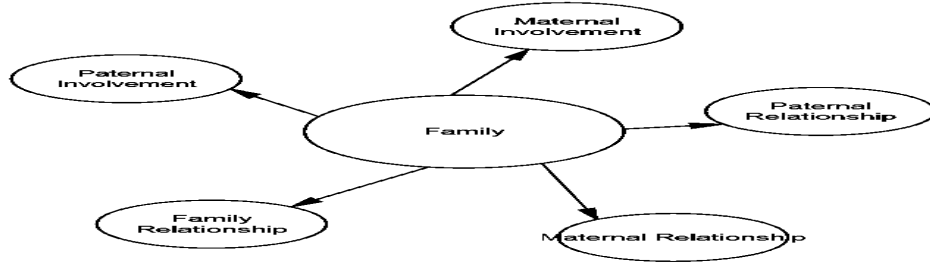


Figure 2. Alternative Family Sub Dimension

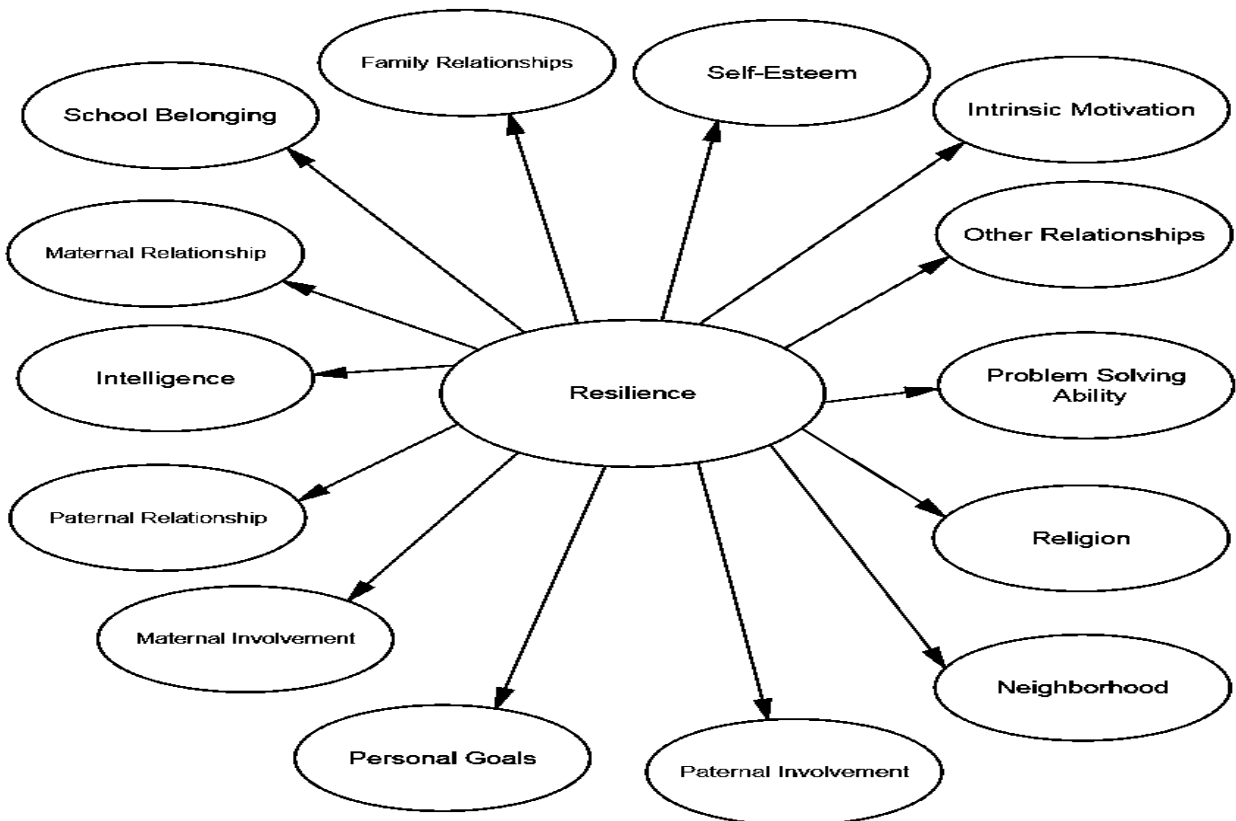


Figure 3. Alternative Single Sub Dimension model

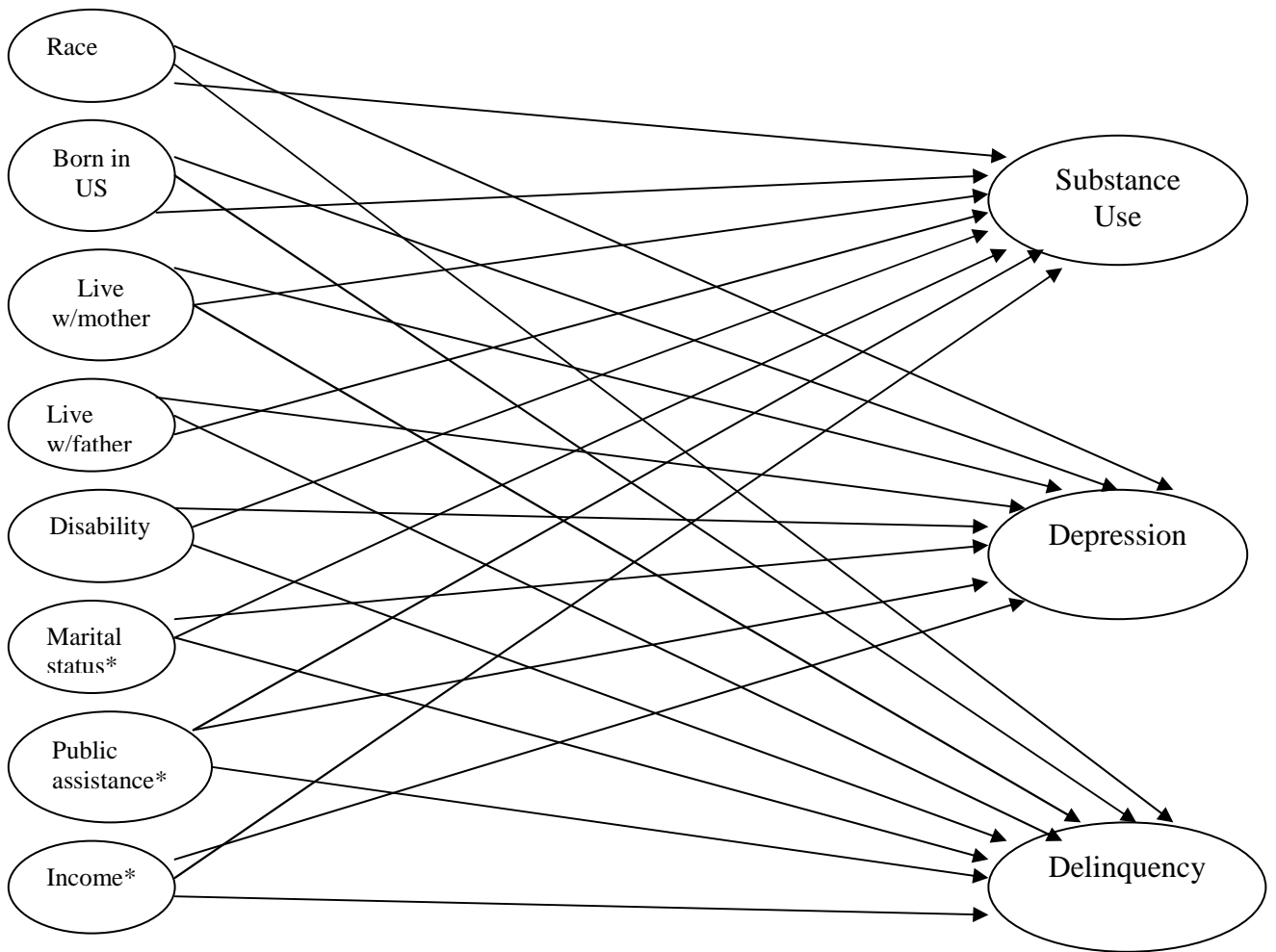


Figure 4. Risk Factors and Negative Outcomes (*Items asked of participants' parent)

CHAPTER 3

METHODS

Data Set

Participant data was gathered from the Add Health data set. This study was to specifically look at information gathered from Waves I and II of data collection.

Furthermore, only participant information from the public-use data set were to be used. The Add Health data has been collected longitudinally over a period of 24 years (Harris et al., 2009). The first wave of data collection occurred in the 1994-95 school year when participants were in Grades 7-12. Data for Wave II were collected in 1996, with a period from approximately six months to two years between when participants in Wave I were interviewed again in Wave II.

A random, stratified sample of all of the high schools in the United States was chosen from which to collect data. Schools were eligible if they included an 11th-grade and if they had a minimum of 30 students. The schools were stratified based on various criteria including urbanicity, school size, region of the country, school type, grade span, type of curriculum used, percentage of Caucasian students and percentage of African American students. Eventually, 80 high schools were chosen that were thought to be nationally representative.

Over 90,000 participants from the 80 selected schools completed the in-school questionnaire. In addition to the adolescent participants who were surveyed, Add Health researchers also gathered data from peers, teachers, parents, siblings, friends, school administrators and romantic partners. School administrators provided information about their respective school districts. All of this data was gathered by paper and pencil questionnaires.

Existing databases concerning respondents' communities were merged with the Add Health database in order to provide information on poverty, income, and unemployment levels as well as information on utilization of healthy services, crime rates, church membership, and social programs and policies.

From the group that completed in-school questionnaires, a core group of participants from each high school was randomly chosen for in-home interviews. This group included over 27,000 participants. Various researchers interviewed each of the participants using a standardized, quantitative interview. Throughout the interview, when participants were providing answers with more sensitive or personal information, responses were recorded by participants into a computer. This methodology served to limit social desirability effects on participant responses. Some individuals who were interviewed were those who came from a selected "oversample". These included groups such as disabled students, adolescents with a twin, Puerto Rican students, and many others. This oversample group also included saturated schools in which all of the adolescents from certain schools were chosen to participate in the in-home interview. One-half of this core sample was chosen at random to make up the public-use data set. There is a potential for this study to have over 6500 participants utilizing this portion of the data set. More information on data collection procedures and participants from the Add Health data set can be gathered from the Add Health website if desired (Harris et al., 2009).

Analytic Strategy

To address the first through the fourth hypotheses of the study, as well as the first research question, a type of structural equation modeling (SEM) called confirmatory factor analysis (CFA) was to be utilized. CFA is often used to find the measurement model when

running SEM. It is used to examine specific models rather than exploring all relationships between given constructs (Kline, 2005). It is based on previous knowledge about theoretical models. A sample size of over 300 is recommended when running a structural equation model, which will be utilized in this study, to ensure stability of the analysis (Kline, 2005). Tabachnick and Fidell (2007) provide the guideline that 1000 participants is considered an excellent sample size. The use of the Add Health data set follows these suggested guidelines because of the very high number of 13,000 adolescents involved in the study. To address the fifth hypothesis, the same process was completed but with the alternative SEM models. In order to determine which model was the better fit, a chi-square difference test was conducted between the original model and the alternative models of family, internal and external as components of resilience and resilience as a single factor model.

With this particular data set, responses are ordered and categorical in nature, and it is expected that responses will be highly skewed. To avoid bias in the results of analysis of non-normal distributions, Kline (2005) suggests asymptotic distribution free (ADF) estimation as an option for analyzing these types of data. This method does not assume multivariate normality. However, for this type of analysis, much larger sample sizes are necessary. Kline (2005) recommends sample sizes ranging from 200-500 when using ADF estimation. Use of the formula $1.5(p+q)(p+q+1)$, where p is the number of observed exogenous variables and q is the number of observed endogenous variables, is suggested as a more specific method to determine necessary sample size when using ADF (Finney & DiStefano, 2006). With the scale of interest in this study containing 50 items, each being an observed endogenous variable, the necessary sample size would be 3825.

Cudeck, Du Toit, and Sörbom (2001) suggest that sample size when using ADF should also be based on the kurtosis of the variables. For instance, with kurtosis ranging from -1.00 to 0.00 , there should be 50 participants per scale item (Cudeck et al.), and as kurtosis increases, so does the suggested sample size. The use of ADF estimation in this study and the large number of participants needed provide further support for the use of the Add Health data set because of its large pool of participants.

To help validate the effectiveness and accuracy of this model, and to address the sixth hypothesis, analyses with both Waves I and II was to be used to provide data regarding test-retest reliability and measurement invariance. Using correlational statistics, r for overall resilience scale scores would be compared across both waves of data collection. In order to help determine the reliability of the measure over time, it was expected that these correlations would be significantly related ($r \geq .70$). This would provide further evidence for the reliability of the overall model.

In order to address the seventh hypothesis, participants were to be divided into two groups representing early and middle adolescence. Early adolescence ranged from 12-14 years old and middle adolescence ranged from 15-18 years old. These two age groups were to be compared to demonstrate that the proposed model is applicable to all adolescents, despite developmental level as well as examine potential measurement invariance. A chi-square difference test was to be completed to compare the models and a nonsignificant difference was predicted. This would provide evidence for the model fitting equally well for both early and middle adolescents.

In addition, questions regarding risk factors in each participant's life were to be used to provide criterion validity for the resilience model scores. This would address the second

research question of the study. This type of validity was measured by using multiple regression analyses and controlling for the covariates described in Appendix C. Regression was to be used because of its ability to predict the relationship between variables (Tabachnick & Fidell, 2001). Regression using covariates in the analysis would show how resilience predicts various outcome items after controlling for various risk factors. Evidence for validity would be shown if resilience is significantly and inversely related to the outcome measures described in Appendix B. In other words, if a participant was to score highly on the resilience model, it would be expected they would answer they had not engaged in any of the behaviors described by the risk factor items. These risk factor items are discussed in more detail below.

Data Cleaning

A missing values analysis (MVA) was to be conducted to determine if data was missing at random (MAR) or completely missing at random (MCAR). The MVA would provide information as to whether data deletion or imputation should occur. If MAR or MCAR conditions were met, participants with missing data did not have to be deleted from the data set and the areas of missing data could be supplied by imputation methods. However, if missing data was found to be more systematic, then these cases would need to be further studied to determine potential reasons for missing data, as well as if these patterns warrant that the cases be deleted from the data set.

It should be noted there were a few items on the proposed measure that were measured by a single indicator (see Appendix A). This poses a technical challenge when analyzing any type of SEM model. In order to better estimate the potential measurement error that exists with this type of indicator, one could make an a priori estimate of the

proportion of variance explained that is due to measurement error (Kline, 2005). Rather than setting up the error term as a free parameter and allowing the computer program to make the measurement, this type of estimation controlled for potential identification problems with the model. This type of estimate was completed in this study for the single factor indicator measuring the Intelligence and Intrinsic Motivation items in this model. Given that these two items were not used in previous studies using the Add Health data, *a priori* estimation based on previous research was difficult. However, both Kline and Bedeian, Day, and Kelloway (1997) use .20 as a starting point for these types of estimations and it was used in this study as well.

Model Item Selection

Item selection from the Add Health data set was based on an extensive literature review of resilience research and the internal and external factors that contribute to the resilience of an individual. Furthermore, additional evidence for the use of many of the model items was found in articles that have been published using the Add Health participants. Model items were divided into 14 separate categories including: school belonging, neighborhood belonging, intelligence, intrinsic motivation, problem solving, self-esteem, paternal involvement, maternal involvement, paternal relationship, maternal relationship, family relationships, other supportive relationships, religion/spirituality, and personal goals. There are a total of 50 items, with 14 items addressing the internal factors component and the remaining 36 items addressing external factors.

As described in the literature review, many of these concepts have been supported as a component of resilience in previous research. See Appendix A for a complete list of items and citations supporting their use. Items that have not been previously used by Add Health

researchers are described in detail below (other items that have been previously used in research have relevant citations in Appendix A). After these items were chosen, the scoring of some of the items was re-ordered. This was done so a higher score on the Likert scale of each item would contribute to a higher overall resilience score on the entire measure.

In the current model, there were four neighborhood belonging items. A sense of belonging is a very important piece of resilience in individuals. Therefore, this further measurement of belonging, in addition to school belonging, was added to the measure. In addition, Benson, Galbraith, and Espeland (1998) implied that a caring neighborhood was an important external asset for successful adolescent development. Furthermore, neighborhoods with higher crime rates and levels of peer pressure to engage in risky behaviors have been linked with lower levels of resilience in adolescents (Marsiglia et al., 2002).

Two items from the Add Health dataset were used to assess participants' intelligence. The first was the participant's score on an adapted version of the Peabody Picture Vocabulary Test (PPVT). This test provided a score regarding one's receptive vocabulary skills and had a mean score of 100 with a standard deviation of 15. It has been found to positively correlate with other intelligence tests such as the Wechsler Intelligence Scale for Children-3rd Edition (Slate, Jones, Graham, & Bower, 1994). According to Jaccard, Dodge, and Guilamo-Ramos (2005), this version of the PPVT is approximately half the length of the original measure. Correlation between the original and the adapted measure was .96. It was also reported that the PPVT correlated other intelligence measures such as the Wechsler Intelligence Scale for Children and the Stanford-Binet Intelligence Test ($r = .64$ and $.62$ respectively) (Jaccard et al., 2005). The second item was the following question: "Compared to other people your age, how intelligent are you?"

Intrinsic motivation was also assessed using one item: When you get what you want, it's usually because you worked hard for it. As with the neighborhood belonging items, these were also not used in other studies using the Add Health dataset. However, previous research has discussed the importance of these factors in the resilience of an individual including in-depth literature reviews of resilience by Smith and Carlson (1997) and Smokowski et al. (1999). Studies by Everall et al., 2006 and Bender et al. (2007) also found both intrinsic motivation and intelligence to be a part of the internal characteristics that lead to resilience in an individual. Problem solving ability was assessed using four items from the dataset. The study completed by Everall et al. also described the ability to work through and solve problems as a component of resilience.

Family relationships as a whole were to be assessed in the proposed model using four items. As can be seen in Appendix A, only the final three items have been used previously by researchers to measure family relationships and the amount of family cohesion an adolescent perceives. The item not used, "How much do you feel your family pays attention to you," however, seemed to pertain to the closeness an adolescent might feel among their family members and provided more insight into how they feel about their home life. It may also have played a part in how close an adolescent feels to family members, which is also important given the past use of the "Overall how close do you feel to your mother/father" items in the Maternal and Paternal Relationship scales.

Finally, there were two items that addressed the personal goals of each individual. These were: "On a scale of 1 to 5, how much do you want to go to college" and "On a scale of 1 to 5, how likely is it that you will go to college?" Despite lack of use of these items in previous studies using the Add Health database, having personal goals and a future

orientation have been found to be important in resilient individuals (Smokowski et al., 1999). Therefore, these items were included. In addition, a study completed by McKnight and Loper (2002) used a number of overlapping items with the current study to assess resilience in adolescents. These included: “How important is religion to you,” “Teachers at this school treat students fairly,” “I feel close to people at this school,” and “How much do you want to go to college?” This provided further support for the use of these items.

Outcome Item Selection

A total of 24 items were chosen to examine negative outcomes that participants may have experienced. As with the resilience model items, a vast majority of these items were chosen based on the work of previous studies utilizing the Add Health database. Items were chosen also based on a review of the literature regarding resilience and what types of risky behaviors resilience can protect individuals from engaging in. Outcome items were divided into three separate sub-categories, including substance use, delinquency, and depression. See Appendix B for a complete listing of items and citations that support their use due to previous research examining resilience. All outcome items have been used in previous research using Add Health data. It should be noted that items addressing substance use were changed from continuous to categorical items. For example, instead of totaling the number of times a participant used marijuana, this was changed to a yes or no item. This was done by following previous work with these substance abuse items by Kohlhart and Marszalek (2010).

Covariate Item Selection

A total of eight items were selected as risk factors that were to be analyzed as covariates. These items were pre-existing factors in participants’ lives that could produce

some amount of hardship. In controlling for these items, the analysis would show that resilience influences the chosen outcome items despite the presence of risk factors (See Appendix C). There is research that demonstrates the effect of each of these risk factors on the chosen outcome measures for the present study (i.e. depression, delinquency, substance use). Additionally, other researchers using the Add Health database have connected many of these risk factors, or covariates, to the outcome items chosen for the present study. These connections are shown in Appendix D.

Strengths and Weaknesses of Using an Archival Data Set

Due to the Add Health database being archival in nature, it was important to delineate the strengths and weaknesses of using this type of data in research projects. As stated previously, using this type of data was useful because of the large number of potential participants to draw from. All analyses completed as a part of this project had adequate power due to a large sample size. The data is also longitudinal, which was to be used to provide evidence of the reliability of the model over time. It is also nationally representative, which indicates the results can be applied to many different types of cohorts of adolescents.

One weakness to consider is the limited scope of items for the proposed model. Despite the large amount of data collected for the Add Health data set, some areas that related to resilience may not have been included or were not explored in adequate detail. For instance, only one item was used to address the construct of intrinsic motivation. The construct of spirituality was also missing from the proposed model due to the limited scope of the data set. Data for Wave I and II were collected approximately 15 years ago. This may also have caused a problem with the validity of inferences that could be drawn from the data.

Some of the items that indicate the constructs that contribute to resilience may have changed in such a long period of time.

CHAPTER 4

RESULTS

Data Screening/Preparation

To prepare the data set for analysis, many of the items had to be re-coded so each would be measuring in the same direction. More specifically, a higher score on any item on the measure indicated a higher level of resilience, while lower scores indicated the opposite. Missing responses to items regarding a participant's mother or father also had to be recoded according to whether or not the item was legitimately skipped or was simply missing data. For example, participant may not have answered a question about his or her mother because his or her mother does not live in the home rather than simply forgetting to answer it. Other item responses such as "I don't know", "Not applicable", etc., also were recoded in the data set as system missing. Along the same lines, responses to the three religion items had to be recoded in order to control for those who did not answer a question due to religious affiliation versus those who left the item blank for another reason.

The large variance of responses to the Peabody Picture Vocabulary Test was several magnitudes larger than the variances of other variables (i.e. responses to other Add Health questions), making them *ill-scaled* for inclusion in the same model. Ill-scaled variables can cause empirical underidentification of SEM models. Therefore, the Peabody responses were divided by ten before analysis was completed.

As described in Chapter 3, SPSS 17.0 was used to conduct a missing value analysis. For some variables, around 20% of the cases were found to be missing. However, the data in each case were missing at random (MAR), meaning that whether the case was missing data on a particular variable had no relationship to the value of the dependent variables.

Therefore, the method of median imputation was used for all of the missing data in the data set (i.e. the median of each item was used to replace the missing data). The median, rather than the mean, was used for imputation because the items were highly skewed (skewness statistics were greater than or equal to three times their standard errors). After these steps were completed, no additional items contained missing data. However, it is important to note that in the final data set, items addressing parents or religion had values of 0, indicating an absence of data rather than missing data as described earlier. No further cases were deleted due to missing data, and the final data set contained 6504 participants.

Examination of the inter-item correlations (see Appendix E) revealed some cases of multicollinearity, which was addressed next. On the Maternal Relationship and Paternal Relationship subscales, multiple indicators were correlated at .80 or above. In addition to multicollinearity among these items, the questions were worded similarly to each other, as well as to the Maternal and Paternal Involvement scales. This indicates that the items were measuring the same attributes. Therefore, it was decided to drop these items from analysis.

Full Model

Model estimation

As described in Chapter 3, the two-step approach to estimating structural regression models (the type of SEM used here) was employed (Kline, 2005). To begin analysis of the proposed resilience model, the overall measurement model must be examined first. This will address the first hypothesis outlined in Chapter 2. The fit of this initial model was examined and the model was modified as necessary (e.g., if model fit is inadequate). Next, the structural components of the model were added and the full model was estimated. Once the fit indices of the full model met the necessary standards, the measurement and structural

models were compared to determine if the structural part of the model had adequate fit to the data.

As mentioned in Chapter 3, asymptotically distribution-free (ADF) estimation was used to fit all models. However, for multiple reasons, a lower than normal cut-off for CFI was used than might be employed in other research. To begin, the model was very complex (i.e., it had many free parameters to be estimated). Fan and Sivo (2007) reported that model complexity is associated with decreases in CFI. In addition, incremental fit indices (such as CFI) are perpetually lower when using ADF estimation as opposed to using maximum likelihood estimation (MLE; Sugwara & MacCallum, 1993). Further, Sugwara and MacCallum (1993) found that none of the CFIs obtained with ADF estimation in their research exceeded .90, even when CFIs obtained with MLE did exceed .90. The adopted cutoff for CFI was .85 in the current study. The value for SRMR, in order to retain the model, was below .10 while it was for below .80 for RMSEA.

Measurement model

The measurement model of resilience with each of the previously described factors was estimated, but the model did not converge. It was thought that this was due to the instability of factors that contained less than three indicators. Therefore, the intrinsic motivation factor was dropped because it was a single item indicator. The personal goals factor also only had two indicators, and these items were deleted from the model. Further, justification for dropping of these items was due to less support in the literature for these particular constructs. The Add Health data set had a limited number of items that could be included, and while personal goals may be an important part of resilience, the questions from the data set related to personal goals were not well-written and did not encompass the entire

construct. In addition, it is difficult to justify keeping the intrinsic motivation construct, because it only had one indicator and most likely did not fully represent the construct on its own.

The originally specified factor of intelligence had two indicators (see Appendix A), which is an unstable structure (Kline, 2005), so both were changed to exogenous observed variables (i.e., the factor of intelligence was removed but the items remained). Theory justified keeping these items because of the frequent mention of intelligence in the literature as playing an important role in resilience (Bender et al., 2007; Boardman & Saint Onge, 2005; Everall et al., 2006; Jaccard et al., 2005; Martel et al., 2007; , but Add Health did not have any other indicators of intelligence available.

After the previous adjustments were made, the measurement model converged, but the fit statistics (namely CFI) needed to be improved. Chi-square was 5641.549 ($df = 650$, $p < .001$). Additional fit statistics included a SRMR of .060, a CFI of .788, and a RMSEA of .034 with a 90% confidence interval ranging from .033 to .035 and a p_{close} value of 1.00. This p -value reflects a null hypothesis significance test of whether the value of RMSEA is equal to .05 in the population (recall from Chapter 3 that .05 is the cutoff for “good” fit). If the p_{close} value is found to be greater than .05, the null hypothesis that RMSEA is equal to .05 is retained. CFI is considered poor here, while the other fit statistics range from good to excellent. Hu and Bentler (1998) found that SRMR and CFI were the most valid indicators of global fit for ADF estimation. Therefore, model respecification was indicated.

Due to low correlations with all other items, the school belonging item, “Students at your school are prejudiced,” and the neighborhood belonging item, “You feel safe in your neighborhood,” were dropped from the model. These items were also dropped because the

language they used was very different from that of the rest of the items on their respective subscales and this could lead to less validity when measuring these constructs.

The entire problem solving subscale was also removed because of a low correlation to the other factors in the model. The Add Health dataset did not provide enough questions to adequately measure the construct. The items used were also may not have been written clearly or comprehensively enough to properly measure problem solving skills in participants. In addition, the intelligence items were deleted due to insignificant relationships with other factors. These two items likely did not measure the entire construct of intelligence, especially since one question measured perceived intelligence rather than actual intelligence (this may be a different construct entirely). After these adjustments were made, the model was retained. Chi-square was 2625.971 ($df = 349, p < .001$) with an SRMR of .041, CFI of .860, and RMSEA of .032 with a 90% confidence interval ranging from .031 to .033 with a p_{close} value of 1.00.

Parameter estimates can be found in Table 1. The majority of the standardized regression coefficients (i.e., direct effects) indicated a strong fit for each indicator to its respective subscale. These loadings ranged from .512 to .934, but there were a few indicators that fell below .50, which in each case would indicate that less than 25% of the item response variance was explained by the factor the item was meant to indicate. The item, “How much do you feel your parents care about you?” had a substandard direct effect of .383 (14.7% of variance explained) on the Family Relationships scale. The item, “How much do you feel your friends care about you?” did not load well on the Other Relationships scale; its factor loading was .424 (18.0% of variance explained). These items were retained because they

provided essential content validity to the scales, and because the variance explained was at a moderate, though not large, level.

Correlations among the factors were all positive and significant at the .01 level, but variable magnitudes were observed. For example, the strongest correlations were between family and other relationships ($r = .710$), and school belonging and other relationships ($r = .541$; see Table 2), very large and large in magnitude, respectively. The weakest correlations were between paternal involvement and maternal involvement ($r = .069$), and between paternal involvement and self esteem ($r = .052$), both small in magnitude.

Reliabilities of the subscales associated with each factor were calculated using a method proposed by Raykov and reported in Brown (2006). These ranged from barely adequate (.598, Other Relationships; .615, Neighborhood Belonging) to good (.723, Maternal Involvement; .775, School Belonging; .688, Family Relationships) to very good (.852, Paternal Involvement; .883, Religion; .868, Self-Esteem). None of the reliabilities was low enough to warrant exclusion of any of the scales from the model.

In order to test an alternative model to the overall measurement model, a single-factor measurement model was tested. Chi-square for this model was 10312.129 ($df = 377, p < .01$). Other fit indices included a CFI of .387 (poor fit), an SRMR of .17, and RMSEA of .064 with a 90% confidence interval ranging from .063 to .065 and p_{close} value $< .001$ (good fit). However, to provide further evidence for support of the original measurement model over the single-factor model, a chi-square difference test was completed. The result showed a significant χ^2_{diff} of 7488.562 ($df = 8, p < .001$), which indicated that the single factor model fit significantly worse to the data than the measurement model that was retained.

Structural model

A hierarchical CFA structural model was constructed to measure the global fit of the model. It included one second-order factor of Resilience (see Figure 5). On initial analysis, the model converged with good fit statistics: $\chi^2 = 2823.594$ ($df = 369$, $p < .001$); CFI = .849; SRMR = .044; and RMSEA = .032 [.90 CI = (.031, .033), $p_{close} = 1.00$]. A chi-square difference test was conducted between the measurement and full models to assess the fit of the structural part. The result showed a significant difference [$\chi^2_{diff} = 197.623$ ($df = 20$, $p < .001$), which indicated a detrimental effect of the structural part on the overall fit of the model.

However, it is widely recognized that chi-square difference tests are sensitive to larger sample sizes, and may not be the best index to determine the fit of the structural part of a model (Brown, 2006). In recognition of this, McDonald and Ho (2002) suggested calculating RMSEA and McDonald's Goodness of Fit Test (Mc) for the structural part. Furthermore, Hutchinson and Olmos (1998) found that RMSEA and Mc were stable for ADF estimation when using skewed, leptokurtic data, such as that occurring in the current data set. For these reasons, it was decided to use RMSEA and Mc to assess the fit of the structural part of the model. RMSEA for the current structural part of the model was .037, which indicates good fit. In addition, Mc was .986, which indicated excellent fit, so the model was retained.

Although all the path estimates of the effects of Resilience on the first-order factors were significant at the .001 level, and about half were strong. These latter ranged from standardized regression weights of .654 to .846, and in terms of effect sizes, were considered large. However, four of the pathways toward subscales fell in the small effect size range. The standardized path estimate for the effect of Resilience on Neighborhood Belonging was

.263, while Religion also had a weak relationship of .245. Resilience also had small effects on both the Mother and Father Involvement, and had standardized path estimates of .155 and .120, respectively. These results indicated that, in this instance, while the Relationships, Self-Esteem and school-related scales related strongly to the overall construct of Resilience, the remaining factors related weakly.

As indicated by R^2 estimates, Resilience explained the most variance in Other Relationships (71.5%). Three additional subscales, Family Relationships, Self-Esteem, and School Belonging, also had large amounts of variance explained by Resilience. These values were 64.2%, 42.8%, and 44.1%, respectively. Two subscales had variance explained by Resilience at small percentages: Paternal Involvement had 1.4% variance explained by Resilience while Maternal Involvement had 2.4% variance explained. Finally, Resilience explained 6.9% of the variance in the Neighborhood Belonging scale and 6.0% of the variance in the Religion scale, small-to-medium amounts.

In addition to the evidence for a hierarchical factor model with a single second-order factor of Resilience, a hierarchical structure with two second-order factors was also supported. The full structural model for Resilience was adjusted to include both a second-order factor for External Resilience and a second-order factor for Self-Esteem (the sole remaining hypothesized internal component of resilience, see Figure 6). These two models were *equivalent*, meaning they were mathematically the same even though they differed in the conceptualization of their pathways. In this case, the relationship between Self-Esteem and Resilience was changed from a directed pathway to a nondirected pathway, or correlation (and the label of “Resilience” was changed to “External Resilience”). Because of their mathematical equivalence, the choice between the two models was based on theory: most of

the existing literature shows evidence for both internal and external factors of resilience (Bender et al., 2007; Burnham, 2009; Everall et al., 2006; Lansford et al., 2006; Oliver et al., 2006; Washington, 2008; Windham et al., 2005). Therefore, the model involving the two second-order factors of Self-Esteem and External Resilience was retained.

A third model was also tested that included Resilience as a single third-order factor, and External and Internal Resilience as two second-order factors. However, this model failed to converge (i.e., it was empirically underidentified), and may have been theoretically underidentified, because the third-order factor had only two indicators (i.e., the two second-order factors).

Internal Model

The next step in the analysis, according to the second research hypothesis, involved examining the internal and external factors separately by running both the measurement and structural models to determine the fit indices. The measurement model for the internal factors included all original components, including those that may have been deleted in the original model. The model initially failed to converge, so, for the same reasons stated in the previous analysis, the Intrinsic Motivation factor was removed from the model. After removing this variable, the model converged with a chi-square of 1257.67 ($df = 71, p < .01$) and an SRMR value of .064. CFI was .754 and RMSEA was .051 with a 90% confidence interval ranging from .048 to .053 and a p_{close} value of .353. As done with previous models, adjustments began at this point to improve model fit to acceptable levels.

The fourth factor was deleted from the model due to its low correlation with the other indicators. Deletion of this factor was also justified on substantive grounds, because the wording of the items did not fully encompass the theoretical concept of problem solving.

Intelligence was made into a single observed variable using the Peabody score. After this, chi-square was 666.95 ($df = 49, p < .01$) while SRMR was .039, CFI was .855, and RMSEA was .044 with a 90% confidence interval ranging from .041 to .047 and a p_{close} value of .999. These all indicate an acceptable to good fit.

However, after adding the structural part of the SR model, fit statistics were not acceptable and could not be further improved without deleting all factors but Self-Esteem. Therefore, the measurement model was adjusted to consist solely of the Self-Esteem scale, and the use of a single factor in the measurement model precluded the addition of a more restricted structural part (i.e., the measurement model was the same as the SR model). Model fit indices included a chi-square of 838.764 ($df = 9, p < .01$) with a CFI of .943, SRMR of .04, and RMSEA of .119 with a 90% confidence interval ranging from .112 to .126, and a $p_{close} < .001$. CFI and SRMR indicated good fit, but RMSEA indicated unacceptable fit. All of the direct effects indicated a strong fit to the self-esteem subscale. These loadings ranged from .61 to .81 and indicated a good fit of each item on the large self-esteem scale. Parameter estimates can be found in Table 3.

Despite multiple attempts to improve the fit of the model, Self-Esteem was the only remaining internal factor, which further supported the use of self-esteem as the only internal variable in the overall model while many of the external factors remained. While more internal factors related to resilience may exist, they were not addressed clearly enough in the Add Health data for them to fit well in this model. In addition, the results also indicated that a resilience model may be stronger and more complete when external and internal components are combined rather than being considered separately.

External Model

Measurement model

As with the internal model, the external model included all original components that may have been deleted from the overall model. Results for the fit of the measurement model were good, and included a chi-square of 2031.885 ($df = 254, p < .01$), an SRMR of .043, a CFI of .877, and an RMSEA of .033 with a 90% confidence interval ranging from .031 to .034 and a p_{close} value of 1.00. Parameter estimates are summarized in Table 4. Correlations among the factors are summarized in Table 5, and were all significant at the .001 level. The strongest correlations were between the Family Relationships and Other Relationships scales ($r = .694$) and between the School Belonging and Other Relationships scales ($r = .561$). The weakest correlations were between the Maternal and Paternal Involvement scales ($r = .072$) and the Maternal Involvement and Neighborhood Belonging scales ($r = .066$). Most of the factor loadings indicated a strong fit to the respective subscales. These loadings ranged from .52 to .94. There were four items that had substandard factor loadings. The items “How much do you feel your parents care about you?” and “How much do you feel your friends care about you?” had factor loadings of .399 and .421, respectively. The items “Do you usually feel safe in this neighborhood?” and “Student at your school are prejudiced.” had factor loadings of .173 and .245, respectively.

Structural model

A structural part was added to the model that included the second order factor of External Resilience. The model had a good fit initially, and no additional adjustments were made (see Figure 15). The chi-square for this model was 2139.984 ($df = 268, p < .01$). Other fit indices for the model include a CFI value of .870, SRMR value of .047, and RMSEA was

.033 with a 90% confidence interval ranging from .031 to .034 and a p_{close} value of 1.00. These all indicate an acceptable to good fit. A chi-square difference test was conducted between the measurement and full models to assess the fit of the structural part. The result showed a significant χ^2_{diff} of 108.099 ($df = 14, p < .01$). As discussed previously, additional fit indices were calculated due to the sensitivity of chi-square to large sample sizes. RMSEA was found to be .032 and Mc was .984. Both indicate good structural fit.

Many of the items on the external factors structural model had strong factor loadings. These ranged from .52 to .93. Four of the factor loadings, however, were below the cut-off of .5. The item “How much do you feel your parents care about you?” had a factor loading of .385 on the Family Relationships scale. Also, the item “How much do you feel your friends care about you?” had a factor loading of .416 on the Other Relationships scale. On the Neighborhood Belonging scale, the item “Do you usually feel safe in this neighborhood?” had a factor loading of .171 while the School Belonging item “Student at your school are prejudiced” had a factor loading of .244. Half of the subscales did not load strongly on the overall External scale, including Paternal Involvement (.138), Maternal Involvement (.164), Neighborhood Belonging (.287), and Religion (.253). The well fitting subscales included Other Relationships (.889), School Belonging (.655), and Family Relationships (.757). In terms of effect sizes, for the well fitting subscales, these are all considered to be large while the substandard factor loadings are considered small effect sizes.

Alternative Models

To further support the use of the best model, two alternative models were also tested to determine if they might be a better fit for this set of data. The first two were alternatives to the full structural model while the third was an alternative to the measurement model. The

first alternative model tested involved using three second-order factors of resilience, Family, Internal, and External (see Figure 2). However, the model failed to converge. The next alternative model analyzed attempted to add a third order factor of resilience in addition to the two second-order factors of external and self-esteem (see Figure 14). This model also failed to converge.

Measurement Invariance Across Time and Developmental Stage

Waves I and II

Before beginning analyses to examine reliability and validity, I tested the final retained model for constraint interactions. This was accomplished by examining the fit statistics for differences depending on where constraints were applied to the model. More specifically, I ascertained whether a difference existed between unit loading identification (ULI) constraints and unit variance identification (UVI) constraints (constraining the variance of a factor to one versus constraining a pathway from a factor to an indicator to one). None were found; therefore, additional evidence was provided that the model was empirically identified. In order to test the reliability of the proposed model over time (i.e., measurement stability), the data from Waves I and II were compared. Before this process could begin, certain data cleaning procedures were completed. To begin, using SPSS, the data from Waves I and II were merged into one larger file. Then, all cases that did not have data for both Wave I and Wave II were deleted from the data set. This decreased the sample size from a total of 6504 participants to 4834.

Similar to earlier in the analytical process, a MVA was then completed. Five of the six items addressing school belonging and school safety were missing data on approximately 8% of the cases. These particular cases were also deleted leaving a sample size of 4292.

Deletion occurred because the amount of missing data was significant enough that it was more than likely systematic in nature, and, therefore, unlikely to be generalizable to larger populations (Kline, 2005). With this relationship, data imputation, such as with the mean or median, would be inappropriate because it could adversely affect the overall results (Tabachnick & Fidell, 2005). Therefore, listwise deleted was completed instead. It is also important to note that much of this data was missing because these participants were no longer in school when Wave II data was collected.

After this process was finished, the merged data file was split into two separate files, one representing Wave I of the data and the other representing Wave II. A multiple group analysis was completed using both of the previously described data files. This was completed in order to ensure that the models were assessing the same construct in separate groups. In this case, it needed to be verified that resilience was being measured the same in both Wave I and Wave II. This involved comparing one model without constraints (i.e. with parameter estimates free to vary between groups), and one model with equality constraints on some of the parameters (Kline, 2005). It is important to note constraints in Amos force the parameters of each model to be the same for both groups. This means Amos estimates the model for each group separately, but keeps the estimates equal across groups. If the fit is not significantly different between the two, evidence for measurement invariance is obtained.

The chi-square for the unconstrained model was 4362.059 ($df = 738, p < .01$). Other fit indices for the model include a CFI value of .825, SRMR value of .043, and RMSEA was .024 with a 90% confidence interval ranging from .023 to .025 with a p_{close} value of 1.000. Although RMSEA and SRMR meet the criteria for good fit specified earlier, CFI did not (i.e., $CFI < .85$). However, I interpret a value of .825 in this context to be indicative of

good fit, because when assessing test-retest reliability with a coefficient of stability (i.e., a test-retest reliability coefficient), the conventional cutoff for acceptable reliability is somewhat lower than the cutoff for internal consistency reliability (i.e., .70 for the former, and .65 for the latter). Therefore, it seemed reasonable to have a lower cutoff for model fit in this situation, as well. The values of global model fit were good evidence that the resilience model fit both groups well.

When examining the data, it was also found that there were no significant changes between the unconstrained model and the structural covariance model, which is the same model but with the following parameters constrained to be equal between groups: item loadings on factors, first order factor loadings on External Resilience, and the covariance between External Resilience and Self-Esteem. Specifically, chi-square was found to be 4953.734 ($df = 768, p < .01$), SRMR was .046, CFI was .798, and RMSEA was .025 with a 90% confidence interval ranging from .025 to .026 and a p_{close} value of 1.000. A chi-square difference of 591.675 ($df = 30, p < .01$) was found between the unconstrained and structural covariances-constrained models, which would indicate a significant difference between the covariances of External Resilience and Self-Esteem in the Wave I and Wave II data. However, due to the previously mentioned research findings regarding chi-square as an indicator of model fit RMSEA and Mc were also calculated. RMSEA was found to be .066, and Mc was found to be .937, both of which indicate good fit for the additional constraints of the structural covariances model. These findings indicate that the unstandardized first- and second-order factor loadings and covariances in the resilience model remained stable across the six months represented by the lag between Waves I and II.

Although, overall, model fit was found to be good, a noticeable difference existed between the groups when examining the direct effect of External Resilience on Religion. For this reason, the model was run again without the imposed equality constraints on that effect. This led to better overall fit for the structural covariance model. Fit included a chi-square of 4911.081 ($df = 767, p < .01$), SRMR of .044, CFI of .800, and RMSEA of .024 with a 90% confidence interval ranging from .023 to .025 a p_{close} value of 1.000.

Chi square difference tests were run to determine if a significant difference existed between this model and the unconstrained and structural covariance models discussed previously. First, comparing the current model to the unconstrained model reported previously, a chi-square difference of 549.022 ($df = 29, p < .01$) was found. This indicated a significant difference between these models. However, when calculating additional difference test statistics, RMSEA was found to be .064 and Mc was found to be .941. Both indicate good fit for constraints of the current structural covariance model.

A chi-square difference of 42.653 ($df = 1, p < .01$) was found between the current model and the previously discussed structural covariance model. RMSEA was calculated to equal .099 (poor fit) and Mc was found to be .995 (good fit). On the whole, two of these three indices reflect poor fit, indicating a significant difference between the model run with the External to Religion pathway constrained versus unconstrained. Leaving this pathway unconstrained led to better overall fit of the model. Additionally, the standardized path coefficient from External to Religion changed from .748 for both groups to .530 for Group 1 and .892 for Group 2. This difference is moderate and size and can account for the potential change in an adolescent's feelings and beliefs about religion over time.

Early and late adolescence

In order to test Hypothesis 7, it was important to determine if differences existed in the model for early and late adolescents. As described in Chapter 2, early adolescence occurs between the ages of 12 and 14, and late adolescence ranges from 15 to 18 years old. The SPSS data file for Wave I data was divided accordingly with the early adolescent group containing 2302, participants and the late adolescent group containing 3658 participants. A multi-group analysis was completed comparing the model fit for the two groups. As discussed with the Wave I and Wave II multi-group analysis, unconstrained and constrained models were compared to determine if measurement invariance existed.

Initially, the unconstrained model converged and the chi-square value was 3336.440. ($df = 744, p < .01$) with a CFI of .840. The SRMR value was .047 while RMSEA was .024 with a 90% confidence interval ranging from .023 to .025 and a p_{close} value of 1.000. These values indicate good overall fit of the model to both groups. Fit for the structural covariance model was also good. Chi-square was 3497.335 ($df = 771, p < .01$), SRMR was .044, CFI was .831 and RMSEA was .024 with a 90% confidence interval ranging from .024 to .025 and a p_{close} value of 1.000.

As with the Wave I-Wave II analysis, a chi-square difference test was performed between the unconstrained model and the structural covariance model ($\chi^2_{diff} = 160.895, df = 30, p < .01$), and was found to be significant, indicating a difference in fit between the models. However, RMSEA for the difference was calculated and found to be .047, and Mc was found to be .967, providing good evidence that the model with additional constraints fit the data well. These results are significant and indicate no differences were found in the relationship

between early and late adolescence. This finding provides evidence the model works the same regardless of the level of adolescent development.

Similar to the Wave I-Wave II analysis, a noticeable difference existed between the groups on the first-order and second-order factor loadings when examining the effect of External Resilience on Religion, on Paternal Involvement, and on Maternal Involvement. For this reason, the model was run again without the imposed equality constraints on these pathways. Fit included chi-square of 3482.472 ($df = 765, p < .01$), SRMR of .045, CFI of .832, and RMSEA of .024 with a 90% confidence interval ranging from .024 to .025 and a p_{close} value of 1.000. This new model was first compared to the previously reported unconstrained model. A chi-square difference of 146.02 ($df = 21, p < .01$) indicates a significant difference between the original model and the current model with the paternal involvement, maternal involvement, and religion pathways unconstrained. However, RMSEA was found to be .051 while Mc was found to be .973, which indicate good fit for the additional constraints of the current structural covariance model.

A chi-square difference test was also conducted between the previous structural covariance output and the current structural covariance model. The chi-square difference was 14.863 ($df = 6, p = .02$) and did not find a significant difference between the two models. The p -value of .02 is not significant and is above the .01 cut-off value used throughout this project. RMSEA was calculated to be .025 while Mc was .998, and both also indicate good fit for the additional constraints of the former structural covariance model. These findings indicate that the former model with all factor loadings constrained to be equal across groups fits just as well as the model allowing some loadings to vary, which is further evidence that the resilience model is invariant across developmental groups.

Resilience as a Protective Factor

To address the research question that asked whether resilience as conceptualized here would serve as a protective factor, structural regression (SR) models were examined that specified that resilience in an individual predicted certain negative outcomes (i.e., substance use, delinquency, depression) for that individual. In addition, risk factors were added to the model as covariates in order to see if resilience exerted a buffering effect. A buffering effect can be conceptualized as either a mediation effect or a suppression effect as a covariate. Both of these approaches will be investigated and compared, beginning with the mediation effects. Risk factors used were parent income, being on public assistance, minority status, disability, and parents' marital status. Three negative outcome constructs were to be added to the SR model, each with several item indicators.

Just as with the resilience items, the depression items had to be rescaled; in this case, to a scale of 1-4 rather than 0-3. The variable assessing household income was also rescaled by dividing by 10,000 in order to bring its variance to a scale compatible with other variables in the data set. As discussed previously, missing data had to be analyzed to determine whether or not imputation could be used. An MVA was completed and median data imputation was used for each of the risk factor and negative outcome items. Median imputation was used in this case, as opposed to with the measurement invariance analysis, because the missing data was found to be at random (Kline, 2005). Information that was missing was not systematic in nature and, therefore, more generalizable to larger populations.

Delinquency

On first analyzing the measurement model for the delinquency risk factors, the model failed to converge. Fit statistics were so poor for the original delinquency proposed model

that it was decided to use a specific scale previously used and validated in earlier research studies. It was decided to use thirteen items also employed by Regnerus and Elder (2003; see Appendix B). In addition, the delinquency items were assessed as a model by themselves before being combined with the resilience model. The model converged but with poor fit statistics, including a chi-square of 636.756 ($df = 65, p < .01$), a CFI of .510 and a RMSEA of .037 with a 90% confidence interval ranging from .034 to .039 and a p_{close} of 1.000. SRMR was measured at .141.

To improve fit, factor loadings were examined and a cut-off point of .32 was used. A total of 7 items were dropped one at a time in order to improve model fit. The model was reassessed each time. The items that were dropped include “In the past 12 months, how often did you drive a car without the owner’s permission?”, “How often did you go into a house or building to steal something?”, “How often did you steal something worth more than \$50?”, “In the past 12 months, how often did you use or threaten to use a weapon to get something from someone?”, “How often did you sell marijuana or other drugs?”, “How often did you steal something worth less than \$50?”, and “How often did you become loud, rowdy, or unruly in a public place?”. After the seventh item was deleted, model fit was good. Chi-square was found to be 133.618 ($df = 9, p < .01$) and SRMR was .054. CFI was .821 and RMSEA was .046 with a 90% confidence interval ranging from .039 to .053 with a p_{close} value of .809. Although SRMR and RMSEA indicated acceptable fit, CFI was still below the adopted cutoff of .85.

In order to further improve fit, modification indices were examined. An index value of 22.356 was found between the items “In the past 12 months, how often did you paint graffiti or signs on someone else’s property or in a public place?” and “In the past 12 months,

how often did you deliberately damage property that didn't belong to you?" Often, the error terms of these two items might be correlated. However, due to the similar wording and nature of the questions and the tendency for models with correlated error terms to be unidentified, it was decided to simply delete the item regarding painting graffiti. Deleting this item led to further improvements in the fit of the model as indicated by a chi-square value of 16.598 ($df = 5, p < .01$) and a SRMR of .015. CFI was found to be .982 and RMSEA was .019 with a 90% confidence interval ranging from .009 to .029 and a p_{close} value of 1.000. This scale was retained and placed into the measurement model that included the previously developed resilience model.

This model also converged and good fit was found (see Tables 10 and 14). Chi-square was 2874.543 ($df = 491, p < .01$) while CFI was .862. RMSEA was .027 with a 90% confidence interval ranging from .026 to .028 with a p_{close} value of 1.000 and SRMR was .035. Three of the standardized regression coefficients (i.e., factor loadings) indicated a strong fit for each indicator to the delinquency subscale. These loadings ranged from .535 to .633, but two indicators fell below .50, which in each case would indicate that less than 25% of the item response variance was explained by the factor the item was meant to indicate. The item, "In the past 12 months, how many times did you run away from home?" had a factor loading of .353 (17.7% of variance explained). The item, "In the past 12 months, how many times did you take part in a group fight?" also had a substandard factor loading of .396 (19.8% of variance explained).

This model was retained and the structural part of the model was applied (See Figure 14). More specifically, this was a path model involving direct effects from the resilience factors to the risk behavior of resilience. This will help to explain the relationship between

this specific risk behavior and the resilience construct. Chi-square was found to be 3087.744 ($df = 517, p < .01$) while CFI was .852 and RMSEA was .028 with a 90% confidence interval ranging from .027 to .029 with a p_{close} value of 1.000. SRMR was measured at .038. These values all represent a good fit for the model. A chi-square difference test was conducted between the measurement and full models to assess the fit of the structural part. The result showed a significant difference [$\chi^2_{diff} = 213.201 (df = 26, p < .001)$], which indicated a detrimental effect of the structural part on the overall fit of the model. For reasons discussed previously in this chapter, RMSEA and McDonald's Goodness of Fit Test (Mc) were also calculated. RMSEA was found to be .033 while Mc was calculated to be .990. Both indicate good to excellent fit, so the structural part of the model was retained.

The resilience factors had small effects on the delinquency factor and were small and not statistically significant. The path from External Resilience to Delinquency had a standardized regression weight of $\beta = 0.049$, while the path from Self-Esteem had a standardized coefficient of $\beta = -0.054$.

Depression

As described with the delinquency risk factor model, the originally proposed indicators for a depression model were abandoned in favor of a scale used by previous researchers. In this case, Galliher et al. (2004) used nine items to measure depression in adolescents. This model was also analyzed first by itself before being included in a model with the resilience factors. The depression model converged and chi-square was 301.412 ($df = 27, p < .01$), while SRMR was .046. CFI was .787 and RMSEA was found to be .040 with a 90% confidence interval ranging from .036 to .044 and a p_{close} value of 1.000.

Because CFI was less than .85, fit needed to be improved. The two items “You thought your life had been a failure” and “You felt life was not worth living” had a modification index of 58.819. In addition, these items are worded similarly and, therefore, are more than likely addressing similar concepts. They are also the only two items asking a participant specifically how they feel about their lives as a whole. Therefore, it was decided to correlate the two error terms for these items. After this correlation and repeating the analysis, fit statistics improved. Chi-square was measured as 196.295 ($df = 26, p < .01$) and SRMR was found to be .025. CFI was .868 and RMSEA was .032 with a 90% confidence interval ranging from .028 to .036 and a p_{close} value of 1.000. This scale was retained and transferred to the larger measurement model including resilience factors.

This analysis of the measurement model measured a chi-square of 3482.211 ($df = 689, p < .01$) and an SRMR of .032. CFI was found to be .858 and RMSEA was .025 with a 90% confidence interval ranging from .024 to .026 with a p_{close} value of 1.000. These statistics represented a good fit for the model (see Tables 11 and 15). Most of the standardized regression coefficients indicated a strong fit for each indicator to the depression subscale. These loadings ranged from .508 to .811. Two of the indicators fell below .50, which in each case would indicate that less than 25% of the item response variance was explained by the factor the item was meant to indicate. The item, “You didn’t feel like eating, your appetite was poor.” had a factor loading of .443 (22.2% of variance explained). The item, “You felt fearful.” also had a substandard factor loading of .454 (22.7% of variance explained).

The structural part of the model was also applied as described in the delinquency model analysis (see Figure 15). This model also showed good fit and was retained. Chi-

square was found to be 3471.504 ($df = 653, p < .01$) and CFI was .847. SRMR was measured as .035 while RMSEA was .026 with a 90% confidence interval ranging from .025 to .027 and a p_{close} value of 1.000. A chi-square difference test was also conducted and the result showed a significant difference [$\chi^2_{\text{diff}} = 225.727 (df = 25, p < .001)$]. However, RMSEA was also calculated and found to be .035, while Mc was calculated to equal .983, both of which indicated good fit of the structural part of the model. Factor loadings of the External resilience factor show minimal relationship with the depression factor ($\beta = .053$), while Self-Esteem showed a negative relationship ($\beta = -.043$). As with the Delinquency subscale, neither of these relationships was significant.

Substance use

When initially running the originally proposed substance use model along with the resilience components, the model converged and overall fit was good. Chi-square was measured to be 3023.100 ($df = 491, p > .01$) and SRMR was .042. CFI was found to be .860 while RMSEA was .028 with a 90% confidence interval ranging from .027 to .029 and a p_{close} value of 1.000. This model was retained and the structural model was also analyzed to determine the global fit of the substance use model (see Figure 16). Similarly, model fit was good for the unconstrained model with fit statistics (see Tables 12 and 16) including a chi-square of 3235.379 ($df = 517, p < .01$) and an SRMR of .044. CFI was found to be .850 while RMSEA was .028 with a 90% confidence interval ranging from .027 to .027 and a p_{close} value of 1.000.

A chi-square difference test was also conducted and the result showed a significant difference [$\chi^2_{\text{diff}} = 212.279 (df = 26, p < .001)$], but RMSEA was found to be .033, while Mc was calculated to be .972. Both of these indices indicated good fit of the structural part of the

model. The path from External Resilience to substance use showed a weak relationship with the substance use model ($\beta = 0.051$). The path from Self-Esteem was inversely correlated with resilience at $\beta = -0.062$. However, neither of these relationships was statistically significant.

Controlling for Risk Factors

To address the second research question, risk factors were added into the structural models for each of the risk behaviors (i.e., substance use, depression, delinquency) to act as covariates. Due to difficulties with lack of model convergence and overall fit of the model, it was decided to run each covariate separately in each risk behavior structural model. In total, there were five risk factors to be controlled for, which left a total of 15 models to be analyzed and discussed. To begin, the risk factor regarding the race of the participants was changed from a continuous to categorical variable. Participants were divided into “white” and “non-white” groups. Next, the risk behavior models were analyzed with the various risk factors included. Global fit for each of these models was acceptable except for household income, which did not converge. Each of these models was also compared to a structural model without the pathway between the risk factor and resilience, as well as a simpler model with only the risk factor with a pathway to one of the various negative outcomes. The three models were compared to determine whether or not resilience lessens the effect that risk factors have on engagement in risk behaviors. Fit for these models was adequate as well. Chi-square difference tests were performed for the nested models (i.e., the covariate models were nested within the mediation models, but the simple effects models were not nested in either) and all were non-significant. The results for these models and comparisons can be found in Table 16.

Delinquency

First, the risk factor items were placed into the delinquency model individually. The standardized coefficients of the direct effects of External Resilience and Self-Esteem on the item relating to public assistance were 0.062 and -0.054, respectively. However, neither value was significant at the .01 level. The relationship between delinquency and the public assistance item was significant and inverse (not receiving public assistance was coded as 1 while receiving public assistance was coded as 0). The direct effect was -0.194. This indicates it is more likely for adolescents to be involved in delinquency in this sample if their parents are receiving public assistance. When the household income was placed in the model, the solution was inadmissible. None of the relationships were significant when ethnicity was placed in the model. The direct effects for External and Self-Esteem on ethnicity were 0.055 and -0.059, respectively. The factor loading of ethnicity on Delinquency was -0.004. When disability status was examined, the direct effect for External was 0.029, while the one for Self-Esteem was -0.049, and the one for delinquency was 0.133. Finally, the marital status item was not significantly related to the External Resilience (-0.046) or Self-Esteem (-0.044) factors, but was significantly related to delinquency (0.227). This indicates that adolescents in this sample are more likely to engage in delinquent activities if their parents are married rather than divorced, single, widowed, etc (married was coded as 2 while single, divorced, widowed, was coded as 1). All effect sizes were considered small in this model, except for the effect of disability on delinquency which is considered medium.

When the pathway between marital status and resilience was removed, the strength of the relationship between marital status and delinquency decreased to 0.118. The same was true for the relationship between the public assistance risk factor and delinquency. The other

risk factor models were also analyzed, but did not lead to significant changes to any of the direct effects. The results could indicate a protective role that resilience plays between delinquency and the risk factor of parents receiving public assistance and adolescents living in a single parent home. Mediating effects of resilience were not found on the relationship between risk factors and delinquency but evidence was still found for the potential buffering effect of resilience and the risk factors of low socio-economic status and living in a single-parent household. Chi-square difference tests were conducted for between the two types of models for each risk factor. None were significant for delinquency. Models to measure the simple effects from the various risk factors to the delinquency outcome were also analyzed. For most of the items, the covariate model had better fit than the simple effects model according to various fit statistics (i.e., SRMR, CFI, and RMSEA; see Table 16). However, it is difficult to compare the fit of the simple effects to the covariates model because the data is non-nested.

It is also important to look at the amount of variance in delinquency that is explained by both the risk factors and resilience. Marital status and resilience explained 0.052 of the variance of delinquency. When examining the covariates model, the amount of variance explained was 0.053 for marital status and resilience. Public assistance and resilience in the mediation model explained 0.040 of the variance. Variance explained was 0.039 for the covariates model. Ethnicity and resilience explained 0.002 of the variance in the mediation model. For the covariates model, the amount of variance explained was the same. Disability and resilience explained 0.019 of the variance. Using the covariates model, 0.020 was explained by both disability and the resilience factors. These findings show little evidence for

the buffering role of resilience between risk factors and delinquency because of how similar the amounts of variance explained are between models.

Depression

Next, the risk factor items were inserted into the depression model. The household income item was significantly related to the resilience items. The direct effects for External and Self-Esteem were -0.037 and -0.048, respectively. Depression loaded on the household income item was also significant with a 0.070 value. These results indicate that, in this sample, when depression symptoms increase, household income is likely to be higher. In addition, higher levels of household income are associated with lower levels of self-esteem and resilience. Self-Esteem and External had factor loading values of -0.039 and 0.051 on the public assistance item but neither was statistically significant. However, the relationship between depression and public assistance was inverse and statistically significant. The direct effect was -0.047. This value indicates depression is more likely to occur in this sample when parents are receiving public assistance. Ethnicity was not significantly related to any of the factors with direct effects of External and Self-Esteem at 0.045 and -0.038, respectively. Ethnicity had a direct effect of -0.006 on depression. Disability status was significantly related to external resilience with a direct effect of 0.052. This finding indicates if an adolescent in this study was not disabled, they were more likely to display higher levels of external resilience. Direct effect of self esteem was -0.002 and depression loaded on the disability item at 0.025. Marital status was not significantly related to self-esteem (-0.042) or external resilience (-0.050) but was significantly related to depression (0.043). This indicates higher levels of depression may exist in adolescents if their parents are married. All effect sizes were small for this model as well.

After removing the pathway between the risk factors and resilience, the relationship between household income and depression remained significant but it decreased to a value of 0.007. This finding could indicate a protective effect of resilience between lower household income and depression in adolescents. Other significant changes were not present when removing the pathway to resilience factors. Mediating effects were also not found when examining the results of this model. The chi-square difference tests were significant for depression when disability status and household income were the risk factors in the model. These findings indicate significantly better fit for the covariate models in these cases. However, when RMSEA and Mc values were calculated, evidence was provided that indicated lack of significant difference between the models. For disability, RMSEA was found to be .036 and Mc was .999. For household income, RMSEA was .032 and Mc was .999. Similar to the delinquency model, a simple effects model was completed for depression. In this case, fit statistics were better for all of the simple effects models (see Table 16). However, as discussed previously, fit indices for non-nested are difficult to compare.

Depression had 0.003 of its variance explained by the marital status risk factor and resilience in the mediation model. In the covariates model, results were the same with 0.003 variance explained for marital status and resilience. Public assistance and resilience explained 0.004 of the variance for depression in the mediation model. The amount of variance explained increased in the covariates model was the same for resilience and public assistance. Total household income and resilience explained 0.006 of the variance in the mediation model. Results were 0.007 for resilience and household income in the covariates model. Ethnicity and resilience explained 0.001 of the variance in the mediation model while

in the covariates model, ethnicity and resilience explained the same amount of the variance. Finally, the disability item and resilience explained 0.002 of the variance. Variance explained by disability and resilience was also 0.002 for the covariates model. Similar to the delinquency model, lack of variance explained by both the mediation and covariate models indicate little evidence for a buffering effect of resilience.

Substance Use

The substance use model was examined next. When the public assistance item was placed into the model, relationships with the resilience factors were insignificant. Self-esteem had a direct effect of -0.036 and External had a direct effect of -0.039. However, public assistance was inversely and significantly related to drug use (-0.086). This finding indicates that, in this sample, substance use in adolescents is likely to increase if parents are receiving public assistance. Similarly, substance use was also significantly related to the household income item (0.200), which indicates as household income increases, the likelihood of drug use in this sample decreases. Resilience items were not significantly related to the household income item with Self-Esteem having a direct effect of -0.036 and External was -0.039. Ethnicity was not significantly related to substance use or resilience. Substance use had a direct effect of 0.007 while Self-Esteem was -0.022 and External was -0.034. Disability was not significantly related to Self-Esteem with a direct effect of 0.012. However, it was significantly related to both external resilience (0.065) and substance use (0.081). These findings, for this particular sample, indicate that external resilience is likely to be higher in individuals who do not have a disability, and, individuals who do not have a disability or also significantly more likely to engage in substance use. Marital status was significantly related to substance use (0.066), which indicates that adolescents with married parents are more

likely to engage in substance use. External Resilience (-0.029) and Self-Esteem (0.007) were not significantly related to marital status. Once again, effect sizes were small.

The same procedure of removing the path between risk factor and resilience was repeated for the substance use model. The relationship between marital status and substance use remained significant but decreased to 0.047. Similarly, the relationship between household income and substance use decreased to 0.018. These results provide evidence for the protective role resilience might play between substance use and adolescents who grow up in lower income households or in single parent households. Chi-square difference tests were also significant for both the disability and income risk factors. RMSEA and Mc were calculated for these as in the depression model. For disability, RMSEA was .041 and Mc was .999. Income led to a RMSEA of .027 and Mc of .999. These findings further support the potential protective role resilience is playing in these relationships. Simple effects models were also analyzed and fit, once again, was better for these models.

Marital status and resilience explained .007 of the variance of substance use. For the covariates model, 0.007 was also the amount of variance explained by marital status and resilience. Public assistance and resilience explained 0.010 of the variance in the mediation model. The amount explained by public assistance and resilience in the covariates model and resilience was 0.007. For the household income and resilience variables in the mediation model, 0.042 was explained. Household income and resilience also explained 0.042 in the covariates model. Ethnicity and resilience explained 0.003 of the variance in the mediation model. When the covariates model was examined, ethnicity and resilience also explained 0.003. Lastly, disability status and resilience explained 0.009 of the variance. For the

covariates model, disability and resilience both explained 0.007. Results here also show little support for the buffering effect of resilience.

Summary of Analyses Looking for Buffering Effects

Overall, little difference existed between the mediation and covariate models in terms of explained variance. However, the covariate models will be retained because it is the more parsimonious model. Also, the mediation models do not show significant effects of the risk factors on resilience, so mediation cannot be implied. The covariate models are preferred over the simple effects models when more variance is explained as well as when the pathway from each risk factor to the individual negative outcomes shows an increase between the simple and covariate models. When looking at variance, more is explained in the covariate models for delinquency with marital status and ethnicity as risk factors. The same was true for depression and all of the models except for household income. For substance use, this was only true for the marital status item.

Additionally, changes in direct effects were examined. Increases occurred with delinquency in its relationship to disability status and public assistance. Disability increased from 0.138 to 0.187 while marital status increased from 0.118 to 0.122, and public assistance increased in magnitude from -0.193 to -0.208. Values for public assistance and marital status were significant while those for disability were not. For depression, this was true for marital status. Marital status was not significant at 0.031 in the simple effects model but increased to 0.042 and became significant. . Marital status showed an increase in the substance use model. Marital status increased from 0.064 to 0.065. These values were significant. Those relationships meeting both criteria include depression and marital status and substance use and marital status. These findings indicate resilience may play some type of preventative role

between adolescents growing up in a single parent home and engaging in substance use or experiencing depression.

CHAPTER 5

DISCUSSION

Resilience can be especially important for the adolescent population. Adolescents have been found to be more susceptible to stressful events and may perceive events as more stressful than an adult would (Smith & Carlson, 1997). Currently in the literature, there are many theories and differing views regarding the components of resilience and how it can best be measured and fostered in individuals. There is also an abundance of information about what resilience is. There is a need to synthesize this information in a more useful way. The goal of the current study was to develop a comprehensive and concise model that could be employed to examine and measure resilience in adolescents. This model could be used to provide a framework for examining resilience in future research endeavors. In addition to that goal, it was important to provide evidence of the reliability and validity both over time, with different groups of adolescents, and in relationship to engagement in negative outcomes by adolescents.

Hypothesis 1 of the study was supported because a valid model of global resilience was found that included two dimensions of internal and external resilience. The final model included self-esteem as the only internal sub dimension that was retained. For the external dimension, the model included involvement in religion, involvement of the mother and father in the adolescent's life, a sense of neighborhood belonging as well as school belonging, feeling safe in the school environment, and having supportive relationships with family members as well as friends and adults outside of the family.. These results indicate that, for this particular data set, resilience can be measured well using the previously mentioned factors.

Varying sizes of the factor loadings for the external resilience constructs were found. This indicates some of the factors were more strongly related to external resilience than others. This could be due to some of these factors playing a larger role in determining resilience than others. It could also be related to some constructs not being defined and measured as well as they could have been by the items chosen from the Add Health data set.

It is important to discuss, in regards to the full model, the retention of the item “Teachers care about me” from the Other Relationships factor. When the item was deleted, the overall fit of the model was improved. Empirically, the item did not appear to be a good fit. However, based on the current research and theory about the importance of teachers and other supportive adults in an adolescent’s life, it was decided to retain the item (Anderman, 2002; Aronowitz & Morrison-Beedy, 2004; Crosnoe & Elder, 2004; Dubois & Silverthorn, 2005; Glanville et al., 2008; Wight et al., 2006). Not only did fit remain adequate, but the added bonus exists of improving the construct validity of the model. The model becomes more applicable to the measurement of resilience when keeping this particular item.

Hypothesis 2 regarding the internal factors model run individually was partially supported. It stated that intelligence, intrinsic motivation, problem solving ability, self esteem, and personal goals would each be sub dimensions of the overall internal construct. The originally proposed factors did not fit together well enough to develop a larger model of internal resilience. Self-esteem ended up being the only remaining factor. When analyzed as a single factor model by itself, fit was good.

The same process was completed for the external dimension of resilience in order to address the Hypothesis 3. This hypothesis was also partially supported. It stated that school belonging, neighborhood belonging, relationships with parents and other family members,

other supportive relationships, and religion would each be part of the overall external dimension. Not all of the originally proposed factors remained in the external resilience model due to poor fit. Those remaining included religion, supportive relationships with family, teachers, friends, and other adults, and a sense of belonging in school and in one's neighborhood. As with the overall model, the scale addressing one's relationship with their parents was combined with the scale addressing the amount of involvement a participant felt their parents had in their lives. Overall, each of these factors fit well on the dimension of external resilience.

In addition to these significant relationships, a significant relationship was found between the two dimensions of External Resilience and Self-Esteem. This provides support for the Hypothesis 4 of the study stating that the two dimensions, internal and external resilience, would be significantly related to one another. These findings indicate that both internal and external qualities and resources of an individual are important to resilience. Additionally, these items are all related, in this particular sample, regardless of whether they are internal or external in nature. An alternative to this model would be simply including self-esteem as another sub dimension and having a model with resilience as the sole dimension. However, it is important to leave in the distinction of a model that has both internal and external dimension because both, according to the literature, are important in comprising resilience. Additionally, future research can build on current findings and hopefully find additional characteristics that fit well under the Internal Resilience category.

In support of the Hypothesis 5, results showed support for the proposed External/Internal resilience model over the use of two alternative models. This hypothesis stated that the model with the two dimensions of internal and external resilience (i.e., the

model that was retained) would be a better representation of resilience than two alternative models: (a) one alternative model with separate individual, family, and external dimensions; and (b) one alternative model with resilience as the single dimension. The two dimension model of Self-Esteem and External Resilience was retained over the three dimension model of Family, External, and Internal factors based on the results of global model fit statistics. Results did not show a better fit for the proposed model over the single dimension model alternative. However, as discussed above, the model including both Internal and External Resilience as dual dimensions was preferred.

Hypothesis 6 addressed whether or not consistent findings would occur over time for those surveyed. It stated that results of the proposed model would be shown to be consistent across time between Wave I and Wave II participants. More specifically, would resilience, as measured by the proposed model, look the same at the time Wave I and Wave II of data collection. Results supported the sixth hypothesis. When examining the initial output of this analysis, a considerable difference between Wave I and II was noticeable in the relationship between Religion and External Resilience. The items on the Religion subscale included “In the past 12 months, how often did you attend religious services?”, “In the past 12 months, how often did you attend youth activities?”, and “How important is religion to you?” This change in results was addressed by a new analysis which led to better fit. It is possible that an adolescent’s involvement and commitment to religion may not remain consistent over time. Specifically, their answers to the first two items could change due to loss of interest in attending church activities or having conflicting commitments as they grow older. Additionally, due to the inherent developmental changes and identity development that occur

during adolescence, one's belief system may change in a very short time period. This could have led to changes in one's responses to the third item.

Similarly, it was proposed that significant differences would not exist for adolescents in different stages of development. This was Hypothesis 7 and it was also supported. It stated results would look the same for groups of both early (ages 12 to 14) and middle adolescence (ages 15 to 18). . Consistent findings were found for early and late adolescents for most of the resilience factors. There were some differences from early to late adolescence in the relationship between resilience and paternal involvement, maternal involvement, and religion. As with the Wave I-Wave II analysis, it is possible an adolescent's view of and commitment to religion can change over time. Identity development and differentiation of self are key in adolescence and can lead to changes in how one views religion as well as how one relates to his or her parents. The change in parental involvement from early to middle adolescence can be potentially explained by the adolescent's desire to become more independent as they get older and develop an identity separate from their parents. When additional analyses were complete, however, no evidence was found for invariance across groups. Overall, the findings for this analysis imply that resilience, when using this model, is not only consistent across time but is also a construct that remains the same despite developmental level of an adolescent (early versus middle adolescence).

Two research questions were also addressed when analyzing the data from this study. The first question addressed whether or not an overall resilience dimension being added to the proposed model would be a valid model. This is included as a research question as opposed to a hypothesis because the model with the overall resilience dimension is not theoretically identified due to the fact it only has two indicators, or dimensions. However,

this model may be empirically identified. In this case, when adding Resilience as an overarching dimension in addition to External and Self-Esteem, the model was empirically under-identified. Therefore, fit statistics could not be examined. For this particular data set, using Resilience in this way was not possible due to only having two dimensions for the overall resilience dimension.

The second research question addressed the potential relationship between resilience and negative outcomes. It also included controlling for certain pre-existing factors including ethnicity, disability status, marital status of a participant's parents, and household income of a participant's parents. It inquired if a significant relationship between resilience items and questions regarding potential negative outcomes experienced by participants after controlling for pre-existing factors including ethnicity, disability status, marital status of parents, etc would exist. These outcome measures would be tested separately with the same risk factors. Evidence supporting this research question would also provide evidence of resilience acting as a buffer between various risk factors and potential negative outcomes. The relationship between negative outcomes negative outcomes and resilience was analyzed first without controlling for the pre-existing factors. These negative outcomes included substance use, involvement in delinquent activities, and experiencing symptoms of depression. The relationships between delinquency and the resilience factors were not significant. Self-esteem and delinquency were not significantly related to one another. The same finding was true for the depression and substance use models.

Due to lack of fit when adding in all the risk factors simultaneously, each risk factor was added and analyzed separately. This led to five different analyses (one for each risk factor) per negative outcome model. All had good fit except for the household income item

when analyzed with the delinquency risk behavior scale. It was found that, for this data set, when parents were receiving public assistance or if parents were divorced, single, widowed, or separated, adolescents were more likely to engage in delinquent behavior. It was the hope of this researcher that resilience would have mediated the relationship between risk factors and engagement in delinquent behavior but, in this instance, that was not the case. It is difficult to know why resilience did not mitigate the effects of the risk factors on delinquency. These findings could be due to resilience not playing enough of a protective role, in this case, to protect adolescents from delinquency.

When the risk factors were added into the depression model, it was found that level of depression was likely to increase as household income increased. This finding may result from the difference in needs for the adolescent from low socio-economic status versus from high socio-economic status. The individual with the lower income may be more concerned with basic needs such as food, safety, and shelter and may not have as much time to be concerned or focused on mental health issues such as depression. Higher levels of income were also associated with lower levels of external resilience and self-esteem. This finding may be due to less of a need for resilience as level of income increases. One possible explanation for this finding could be that resilience may only develop in the face of adversity and those adolescents from more privileged families may have experienced less adversity.

It was also found that public assistance often led to higher levels of depression in this sample of adolescents. Adolescents with a disability were also found to be more likely to have lower levels of external resilience. The fact that external resilience but not self-esteem was related to disability could indicate that, in this sample, adolescents with a disability may

have struggled to build relationships with others and/or felt less of a connection with others due to their disability.

When examining the substance use model, public assistance was once again found to be significantly related to the risk factor. In this sample, an adolescent living in a household with a parent receiving public assistance was more likely to use substances. Substance use increase was also associated with lower levels of household income. Disability was linked to substance use as well as external resilience. This may indicate that, in this particular group of adolescents, individuals who do not have a disability are more likely to use some type of illicit substance. As with the depression model, an adolescent with a disability may experience lower levels of external self-esteem for reasons discussed previously. Finally, marital status was found to significantly relate to substance use indicating those with married parents may be more likely to engage in substance use. The cause for this particular relationship is unclear.

It was the hope of this researcher to find resilience mediating the relationship between certain pre-existing risk factors and the negative outcomes discussed. However, this was not in the findings. Perhaps resilience is not linked strongly enough to the negative outcomes discussed here. This could be due to the items measuring or the negative outcomes or the negative outcomes chosen. It may also be difficult to quantify and measure what aspects of an adolescent's life that resilience affects.

It may be possible that the mediation conception of resilience was not the most appropriate way to measure relationships in this case. Models in which resilience factors were controlled for, or run as covariates, fit the data better. These models were found to have similar results in terms of variance explained and model fit to the mediation models. Not

enough differences existed to choose one model or the other based on the model fit and variance explained. Since the covariate model is simpler, it is preferred over the mediation model. To further explain the results, these covariate models were also compared to simple effects models that measured the relationship between each risk factor and negative outcome item.

Covariate models were preferred over the simple effects models if more variance was explained and if there was an increase in direct effects between the risk factor and negative outcome between the simple effects and covariate models. This was only true for the marital status risk factor as it related to depression and substance use. These findings indicate some evidence resilience might play a buffering role in these instances. More specifically, adolescents growing up in a home without married parents may be less likely to experience depression and engage in substance use if they have higher levels of resilience.

Limitations and Future Research

An important limitation to be discussed is the use of an existing data set. The Add Health data set provided a wealth of representative participant data but limited the constructs that could be included and explored in the proposed resilience model. By using a data set, the questions included in the research were limited. Multiple proposed constructs had to be deleted from the model due to poor fit of the overall model. Potentially important constructs such as problem solving and intrinsic motivation had to be entirely deleted from the model. This was either due to poor wording of the items included or lack of items to properly measure the constructs proposed as important to resilience in adolescents. The loss of these constructs leaves potential gaps in this model of resilience.

Additionally, the model could possibly have been improved with the inclusion of additional items addressing the constructs that remained in the model. However, this could not be accomplished due to the limiting nature of the use of an existing data set. In the future, more survey items could be developed as well as items that more accurately measure various resilience factors. Qualitative studies could also be completed that serve to further explore the concept of resilience and further validate the proposed model. This type of data would provide a rich, in-depth look at what factors foster resilience in adolescents. It could also help to verify whether or not gaps exist in the model proposed here.

Another limitation to the current study is the length of time between the data collection for the Add Health study and this project. Waves I and II of the dataset were collected over 15 years ago. Further studies could be completed with the later Add Health waves of data. This could be done to continue to follow the same participants over time and provide support for the stable nature of resilience in many adolescents. Studies focusing on information and participants outside of the Add Health data set would also be useful and could utilize the model studied here.

The lack of mediation that was found for resilience in this model was also concerning. This finding could have been due to only being able to control for one risk factor at a time. It may be that other risk factors being included at the same time could have led to more significant results. Resilience is often found in response to cumulative stressors (Smith & Carlson, 1997). Adolescents are more than likely not exposed to a single risk factor that leads to engagement in risky behaviors. It is the accumulation of risk factors that may influence resilience or lead an adolescent to make unhealthy decisions. To possibly clarify the findings from this study, in the future, a composite score for resilience could be computed

and placed into a path model with the risk factors and negative outcomes. Resilience could also be tested as a moderator rather than a mediator in future studies. Changing how these risk factors are controlled for would also make the study more externally valid and, possibly, lead to more telling results.

The sample studied may also have been too diverse. Homogeneity of variance is an assumption of various types of statistical tests. It indicates the variance of data across groups should be the same. This can affect correlations by constricting them as homogeneity increases. A wider range of data can lead to a relationship more fully manifesting itself. It can also lead to finding more relationships or measuring relationships as weaker than they actually are. The same problem can occur with restriction of range in data. To more thoroughly understand how resilience acts as a buffer, it might help to focus more specifically on at-risk or marginalized groups of adolescents. This could include individuals identifying as gay or lesbian or those who are immigrants.

Future research could also include using the proposed model of resilience but with younger and older populations. Along the same lines, using participants who also participated in Waves III and IV of the Add Health study could also be used to provide more evidence for the stability of this model, and resilience overall, over time.

Conclusions

Resilience has been an exciting and popular research topic in the past two to three decades. It has been researched with different age groups, ethnic groups, and in more specific populations such as cancer patients and trauma survivors. The breadth of information available is excellent and one can also find a great deal of depth in the study of resilience. Many theories of resilience exist including how it develops and how it can be fostered in

public schools, psychotherapy clients, and many others. However, currently lacking in the literature is a comprehensive lens through which to view resilience.

Through using a large, longitudinal, and representative data set, a model was successfully developed and analyzed. It was found, for this general US population, that important components of resilience were both internal and external to the individual. These included self-esteem, involvement with parents, a sense of belonging in the school and neighborhood environment, religion, and strong relationships with family members, teachers, friends, and other adults. Support was much stronger for this internal and external model of resilience over those including three components of resilience (family, internal and external) and resilience by itself as a single factor construct. Evidence for reliability and validity was provided and relationships between resilience and problems it is theorized to prevent (i.e. substance use, depression, delinquency) were studied.

Some evidence was also found to show resilience can lead to lower levels of engagement in the aforementioned negative outcomes. Because of this evidence as well as previous research regarding the importance of resilience, this model can be used for the development of programs to foster resilience in at-risk adolescents that can benefit from such programs. Struggling adolescents can be taught how to tap into various resources and build supportive relationships with others.

The model could also be used in the opposite way. Individuals with lower levels of resilience are lacking in internal and external resources, and these individuals could be considered at-risk. With this type of tool for identification, it would be possible to intervene with these adolescents in order to try and prevent certain negative outcomes. Individuals who appear to be lacking in certain areas of the model can be identified as either at-risk or in need

of some type of intervention to help develop resilience. For instance, individuals who lack involvement and support from their parents as well as their peers may be especially at-risk for negative outcomes. Teachers, administrators, school counselors, and others could use this model to help identify these individuals. Many programs that have been designed to foster resilience in various groups of youth have been shown to be very effective (Belgrave et al., 2007). Having a model to more readily identify individuals who could benefit from such interventions could increase their frequency and effectiveness.

For the field of counseling psychology, these results are applicable in many ways. Counseling psychology focuses on an overall wellness model and the strengths and assets of individuals. This model can be built upon and further used to develop resilience in individuals in order to improve and prevent mental health problems and disorders. It is a model that focuses on strengths and resources that individuals possess. Focus on building on external resources and further developing internal characteristics of resilience can be used to train future counseling psychologists as well as inform the practice and research of current counseling psychologists. Counseling psychology also emphasizes brief therapeutic interventions. Therapists who are educated regarding resilience and how to foster it in individuals can more readily focus on shorter and more effective therapeutic interventions. Counseling psychology researchers can also focus on how to most effectively foster resilience in therapeutic settings in order to lead to briefer interventions.

This study serves to synthesize much of the available information as well as provide a more thorough, encompassing framework for studying resilience. It is the hope of this researcher that this model can serve to help focus resilience research in the future. In addition, hopefully it can provide guidelines for the identification of at-risk students and for

the development and implementation of intervention programs that can foster resilience. As these adolescents develop and move forward with their lives, they can become more successful individuals despite past difficult circumstances and make meaningful contributions to society.

Appendix A

Table A-1

Parameter Estimates for the Measurement Model (N = 6504)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother involvement					
Rm11: How often is your mother at home when you leave for school?	1.156	0.023	0.759	0.985	0.042
Rm12: How often is your mother at home when you return from school?	0.920	0.019	0.588	1.598	0.030
Rm13: How often is your mother at home when you go to bed?	0.881	0.029	0.708	0.771	0.029
Father involvement					
Rf11: How often is your father at home when you leave for school?	1.602	0.016	0.809	1.359	0.040
Rf12: How often is your father at home when you return from school?	1.300	0.014	0.784	1.060	0.027
Rf13: How often is your father at home when you go to bed?	1.790	0.019	0.834	1.398	0.052
Self-esteem					
Pf30: You have a lot of good qualities.	0.450	0.009	0.729	0.179	0.006
Pf32: You have a lot to be proud of.	0.542	0.009	0.813	0.151	0.006
Pf33: You like yourself just the way you are	0.625	0.011	0.716	0.372	0.012
Pf34: You feel like you are doing everything just about right.	0.545	0.010	0.669	0.368	0.009
Pf35: You feel socially accepted.	0.469	0.010	0.707	0.219	0.009
Pf36: You feel loved and wanted.	0.472	0.009	0.753	0.171	0.006
Neighborhood					
Nb1: You know most of the people in your neighborhood.	0.285	0.008	0.657	0.107	0.004
Nb2: In the past month, you have stopped on the street to talk with	0.209	0.007	0.532	0.111	0.003
Nb3: People in this neighborhood look out for each other.	0.238	0.007	0.569	0.118	0.004
Religion					
Re3: In the past 12 months, how often did you attend religious services?	1.313	0.011	0.934	0.245	0.015
Re4: How important is religion to you?	1.112	0.015	0.844	0.500	0.013
Re7: In the past 12 months, how often did you attend youth activities?	1.026	0.011	0.748	0.827	0.014
Other relationships					
Pr1: How much do you feel that adults care about you?	0.428	0.012	0.581	0.361	0.014
Pr2: How much do you feel that your teachers care about you?	0.616	0.014	0.684	0.431	0.015
Pr4: How much do you feel that your friends care about you?	0.310	0.012	0.424	0.439	0.011
Family relationships					
Pr3: How much do you feel that your parents care about you?	0.146	0.010	0.383	0.123	0.009
Pr5: How much do you feel that people in your family understand you?	0.674	0.014	0.727	0.405	0.015
Pr8: How much do you feel that your parents pay attention to you?	0.591	0.013	0.694	0.375	0.013
School belonging					
Ed19: You feel close to people at your school.	0.602	0.013	0.672	0.441	0.013
Ed20: You feel like you are part of your school.	0.687	0.013	0.764	0.337	0.012
Ed22: You are happy to be at your school.	0.742	0.014	0.716	0.524	0.016
Ed23: The teachers at your school treat students fairly.	0.508	0.015	0.512	0.726	0.016
Ed24: You feel safe in your school.	0.474	0.015	0.519	0.612	0.015

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-2

Estimated Factor Variances, Covariances^a, Correlations^b, and Reliabilities^c for the

Measurement Model (N = 6504)

Factor	Variance	SE	1	2	3	4	5	6	7	8
1	1.337	0.052	.723	0.098	0.074	0.017	0.068	0.043	0.091	0.034
2	2.565	0.052	.069	.852	0.092	0.027	0.068	0.081	0.191	0.037
3	0.363	0.016	.140	.095	.775	0.025	0.160	0.200	0.112	0.126
4	0.056	0.004	.081	.071	.171	.615	0.026	0.030	0.028	0.021
5	0.349	0.015	.132	.072	.448	.185	.688	0.258	0.105	0.139
6	0.379	0.018	.080	.082	.541	.205	.710	.598	0.130	0.139
7	1.052	0.022	.101	.116	.180	.115	.173	.205	.883	0.060
8	0.223	0.008	.086	.052	.465	.201	.522	.500	.130	.868

Note. All variance and covariance estimates were significant at the .01 level. 1 = Maternal Involvement. 2 =

Paternal Involvement. 3 = School Belonging. 4 = Neighborhood Belonging. 5 = Family Relationships. 6 = Other

Relationships. 7 = Religion. 8 = Self-Esteem.

a. Covariances are located in the upper echelon. b. Correlations are located in the lower echelon. c. Reliabilities are placed on the diagonal, and calculated with the Raykov method (Brown, 2006).

Table A-3

Parameter Estimates for the Internal Measurement Model (N = 6544)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Self-esteem					
Pf30 "You have a lot of good qualities."	0.437	0.008	0.700	0.210	0.007
Pf32 "You have a lot to be proud of."	0.544	0.008	0.808	0.168	0.007
Pf33 "You like yourself just the way you are"	0.659	0.011	0.664	0.479	0.014
Pf34 "You feel like you are doing everything just about right."	0.582	0.010	0.614	0.466	0.011
Pf35 "You feel socially accepted."	0.501	0.009	0.679	0.284	0.010
Pf36 "You feel loved and wanted."	0.513	0.008	0.746	0.213	0.007

Note. All regression coefficients and variance estimates were significant at the .01 level.

Table A-4

Parameter Estimates for the Measurement Model (N = 6504)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother involvement					
Rm11: How often is your mother at home when you leave for school?	1.151	0.023	0.754	1.003	0.042
Rm12: How often is your mother at home when you return from school?	0.923	0.019	0.592	1.579	0.030
Rm13: How often is your mother at home when you go to bed?	0.867	0.030	0.700	0.780	0.029
Father involvement					
Rf11: How often is your father at home when you leave for school?	1.591	0.016	0.805	1.372	0.041
Rf12: How often is your father at home when you return from school?	1.296	0.014	0.784	1.050	0.027
Rf13: How often is your father at home when you go to bed?	1.779	0.019	0.831	1.413	0.053
Neighborhood					
Nb1: You know most of the people in your neighborhood.	0.278	0.008	0.638	0.112	0.004
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.206	0.007	0.519	0.116	0.003
Nb3: People in this neighborhood look out for each other.	0.250	0.007	0.596	0.114	0.004
Nb5: Do you usually feel safe in this neighborhood?	0.085	0.010	0.173	0.236	0.009
Religion					
Re3: In the past 12 months, how often did you attend religious services?	1.318	0.011	0.937	0.243	0.015
Re4: How important is religion to you?	1.109	0.016	0.842	0.506	0.014
Re7: In the past 12 months, how often did you attend youth activities?	1.024	0.011	0.745	0.838	0.014
Other relationships					
Pr1: How much do you feel that adults care about you?	0.430	0.012	0.571	0.382	0.014
Pr2: How much do you feel that your teachers care about you?	0.634	0.015	0.697	0.425	0.016
Pr4: How much do you feel that your friends care about you?	0.308	0.012	0.421	0.440	0.011
Family relationships					
Pr3: How much do you feel that your parents care about you?	0.149	0.011	0.399	0.117	0.009
Pr5: How much do you feel that people in your family understand you?	0.689	0.015	0.720	0.440	0.016
Pr8: How much do you feel that your parents pay attention to you?	0.608	0.014	0.706	0.373	0.014
School belonging					
Ed19: You feel close to people at your school.	0.653	0.014	0.698	0.447	0.014
Ed20: You feel like you are part of your school.	0.722	0.014	0.773	0.351	0.012
Ed21: Students at your school are prejudiced.	0.289	0.017	0.245	1.302	0.018
Ed22: You are happy to be at your school.	0.764	0.014	0.722	0.536	0.016
Ed23: The teachers at your school treat students fairly.	0.516	0.015	0.515	0.738	0.016
Ed24: You feel safe in your school.	0.477	0.014	0.523	0.605	0.015

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-5

Estimated Factor Variances, Covariances^a, Correlations^b, and Reliabilities^c for the External Measurement Model (N = 6504)

Factor	Variance	SE	1	2	3	4	5	6	7
1	0.751	0.052	.720	0.100	0.078	0.016	0.019	0.033	0.085
2	2.532	0.052	.072	.850	0.100	0.039	0.019	0.060	0.183
3	0.426	0.018	.138	.096	0.746	0.039	0.046	0.157	0.123
4	0.077	0.004	.066	.087	.215	0.537	0.008	0.028	0.032
5	0.022	0.003	.144	.080	.477	.203	.692	0.044	0.022
6	0.185	0.011	.088	.087	.561	.232	.694	.601	0.093
7	1.048	0.022	.096	.112	.184	.112	.143	.212	.882

Note. All variance and covariance estimates were significant at the .01 level. 1 = Maternal Involvement.

2 = Paternal Involvement. 3 = School Belonging. 4 = Neighborhood Belonging. 5 = Family

Relationships. 6 = Other Relationships. 7 = Religion.

a. Covariances are located in the upper echelon. b. Correlations are located in the lower echelon. c.

Reliabilities are placed on the diagonal, and calculated with the Raykov method (Brown, 2006).

Table A-6

Parameter Estimates for Group 1 of the Wave I/Wave II Model (N = 4292)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
External ↔ Self-esteem covariance	0.281	0.007			
Mother Involvement	0.099	0.011	0.156	0.396	0.035
Rm11: How often is your mother at home when you leave for school?	1.638	0.061	0.736	0.922	0.048
Rm12: How often is your mother at home when you return from school?	1.288	0.046	0.547	1.578	0.034
Rm13: How often is your mother at home when you go to bed?	1.000		0.598	0.727	0.029
Father involvement	0.176	0.021	0.113	2.398	0.054
Rf11: How often is your father at home when you leave for school?	1.000		0.795	1.412	0.043
Rf12: How often is your father at home when you return from school?	0.814	0.009	0.773	1.087	0.031
Rf13: How often is your father at home when you go to bed?	1.090	0.014	0.814	1.467	0.049
Self-esteem					
Pf30: You have a lot of good qualities.	1.000		0.748	0.162	0.007
Pf32: You have a lot to be proud of.	1.126	0.019	0.816	0.130	0.007
Pf33: You like yourself just the way you are	1.280	0.025	0.687	0.377	0.013
Pf34: You feel like you are doing everything just about right.	1.130	0.024	0.655	0.350	0.011
Pf35: You feel socially accepted.	1.049	0.022	0.734	0.194	0.009
Pf36: You feel loved and wanted.	0.999	0.020	0.748	0.162	0.007
Neighborhood	0.058	0.004	0.268	0.043	0.003
Nb1: You know most of the people in your neighborhood.	1.206	0.046	0.625	0.105	0.004
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.980	0.039	0.549	0.103	0.004
Nb3: People in this neighborhood look out for each other.	1.000		0.538	0.113	0.003
Religion	0.294	0.017	0.272	1.083	0.030
Re3: In the past 12 months, how often did you attend religious services?	0.952	0.009	0.847	0.416	0.015
Re4: How important is religion to you?	0.709	0.008	0.747	0.466	0.013
Re7: In the past 12 months, how often did you attend youth activities?	1.000		0.798	0.665	0.020
Other relationships	0.534	0.011	0.830	0.129	0.015
Pr1: How much do you feel that adults care about you?	0.585	0.019	0.541	0.344	0.015
Pr2: How much do you feel that your teachers care about you?	1.000		0.721	0.383	0.017
Pr4: How much do you feel that your friends care about you?	0.490	0.018	0.448	0.398	0.012
Family relationships	0.458	0.011	0.833	0.093	0.010
Pr3: How much do you feel that your parents care about you?	0.220	0.014	0.344	0.109	0.009
Pr5: How much do you feel that people in your family understand you?	1.176	0.029	0.715	0.400	0.016
Pr8: How much do you feel that your parents pay attention to you?	1.000		0.669	0.372	0.013
School belonging	0.416	0.011	0.709	0.172	0.012
Ed19: You feel close to people at your school.	1.000		0.684	0.391	0.014
Ed20: You feel like you are part of your school.	1.096	0.022	0.755	0.313	0.012
Ed22: You are happy to be at your school.	1.172	0.026	0.695	0.507	0.017
Ed23: The teachers at your school treat students fairly.	0.895	0.027	0.534	0.694	0.017
Ed24: You feel safe in your school.	0.806	0.025	0.528	0.579	0.017

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-7

Parameter Estimates for Group 2 of the Wave I/Wave II Model (N = 4292)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother Involvement	0.099	0.011	0.153	0.413	0.036
Rm11: How often is your mother at home when you leave for school?	1.638	0.061	0.717	1.071	0.049
Rm12: How often is your mother at home when you return from school?	1.288	0.046	0.539	1.707	0.034
Rm13: How often is your mother at home when you go to bed?	1.000		0.595	0.773	0.030
Father involvement	0.176	0.021	0.113	2.412	0.055
Rf11: How often is your father at home when you leave for school?	1.000		0.793	1.443	0.043
Rf12: How often is your father at home when you return from school?	0.814	0.009	0.759	1.191	0.033
Rf13: How often is your father at home when you go to bed?	1.090	0.014	0.831	1.300	0.048
Self-esteem					
Pf30: You have a lot of good qualities.	1.000		0.768	0.143	0.007
Pf32: You have a lot to be proud of.	1.126	0.019	0.843	0.106	0.006
Pf33: You like yourself just the way you are	1.280	0.025	0.712	0.328	0.013
Pf34: You feel like you are doing everything just about right.	1.130	0.025	0.670	0.323	0.011
Pf35: You feel socially accepted.	1.049	0.022	0.766	0.160	0.008
Pf36: You feel loved and wanted.	0.999	0.020	0.781	0.131	0.007
Neighborhood	0.058	0.004	0.240	0.054	0.003
Nb1: You know most of the people in your neighborhood.	1.206	0.046	0.689	0.092	0.004
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.980	0.039	0.609	0.094	0.004
Nb3: People in this neighborhood look out for each other.	1.000		0.567	0.121	0.004
Religion	0.064	0.026	0.049	1.723	0.049
Re3: In the past 12 months, how often did you attend religious services?	0.952	0.009	0.922	0.276	0.016
Re4: How important is religion to you?	0.709	0.008	0.850	0.335	0.012
Re7: In the past 12 months, how often did you attend youth activities?	1.000		0.815	0.875	0.021
Other relationships	0.534	0.011	0.900	0.067	0.013
Pr1: How much do you feel that adults care about you?	0.585	0.019	0.529	0.311	0.014
Pr2: How much do you feel that your teachers care about you?	1.000		0.659	0.458	0.018
Pr4: How much do you feel that your friends care about you?	0.490	0.018	0.439	0.355	0.011
Family relationships	0.458	0.011	0.814	0.107	0.011
Pr3: How much do you feel that your parents care about you?	0.220	0.014	0.346	0.113	0.011
Pr5: How much do you feel that people in your family understand you?	1.176	0.029	0.721	0.405	0.017
Pr8: How much do you feel that your parents pay attention to you?	1.000		0.687	0.354	0.014
School belonging	0.416	0.011	0.711	0.170	0.011
Ed19: You feel close to people at your school.	1.000		0.683	0.391	0.014
Ed20: You feel like you are part of your school.	1.096	0.022	0.762	0.298	0.012
Ed22: You are happy to be at your school.	1.172	0.026	0.709	0.466	0.017
Ed23: The teachers at your school treat students fairly.	0.895	0.027	0.564	0.588	0.015
Ed24: You feel safe in your school.	0.806	0.025	0.543	0.532	0.016

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-8

Parameter Estimates for Group 1 of the Early/Late Adolescence Model (N = 2302)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
External ↔ Self-esteem covariance	0.291	0.008			
Mother Involvement	0.120	0.014	0.181	0.424	0.040
Rm11: How often is your mother at home when you leave for school?	1.518	0.060	0.735	0.858	0.055
Rm12: How often is your mother at home when you return from school?	1.175	0.044	0.532	1.528	0.041
Rm13: How often is your mother at home when you go to bed?	1.000		0.639	0.635	0.034
Father involvement	0.178	0.025	0.115	2.370	0.067
Rf11: How often is your father at home when you leave for school?	1.000		0.794	1.410	0.053
Rf12: How often is your father at home when you return from school?	0.809	0.010	0.764	1.123	0.039
Rf13: How often is your father at home when you go to bed?	1.106	0.016	0.826	1.367	0.059
Self-esteem					
Pf30: You have a lot of good qualities.	1.000		0.729	0.176	0.008
Pf32: You have a lot to be proud of.	1.179	0.025	0.822	0.133	0.008
Pf33: You like yourself just the way you are	1.341	0.031	0.725	0.323	0.015
Pf34: You feel like you are doing everything just about right.	1.172	0.029	0.669	0.317	0.014
Pf35: You feel socially accepted.	0.985	0.026	0.681	0.223	0.011
Pf36: You feel loved and wanted.	1.026	0.025	0.763	0.151	0.008
Neighborhood	0.063	0.005	0.282	0.046	0.004
Nb1: You know most of the people in your neighborhood.	1.110	0.054	0.632	0.092	0.005
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.827	0.041	0.506	0.099	0.004
Nb3: People in this neighborhood look out for each other.	1.000		0.568	0.105	0.005
Religion	0.224	0.016	0.221	0.979	0.032
Re3: In the past 12 months, how often did you attend religious services?	1.263	0.012	0.923	0.284	0.021
Re4: How important is religion to you?	1.063	0.014	0.853	0.436	0.017
Re7: In the past 12 months, how often did you attend youth activities?	1.000		0.722	0.947	0.022
Other relationships	0.525	0.014	0.811	0.143	0.017
Pr1: How much do you feel that adults care about you?	0.671	0.023	0.611	0.316	0.020
Pr2: How much do you feel that your teachers care about you?	1.000		0.716	0.398	0.021
Pr4: How much do you feel that your friends care about you?	0.530	0.021	0.481	0.392	0.016
Family relationships	0.481	0.012	0.844	0.094	0.012
Pr3: How much do you feel that your parents care about you?	0.243	0.015	0.398	0.095	0.010
Pr5: How much do you feel that people in your family understand you?	1.124	0.032	0.723	0.375	0.018
Pr8: How much do you feel that your parents pay attention to you?	1.000		0.687	0.364	0.017
School belonging	0.358	0.012	0.671	0.157	0.014
Ed19: You feel close to people at your school.	1.000		0.653	0.384	0.017
Ed20: You feel like you are part of your school.	1.124	0.028	0.746	0.287	0.017
Ed22: You are happy to be at your school.	1.269	0.035	0.691	0.503	0.024
Ed23: The teachers at your school treat students fairly.	0.945	0.035	0.523	0.677	0.023
Ed24: You feel safe in your school.	0.869	0.033	0.532	0.546	0.020

Note: All regression coefficients and variance estimates were significant at the .001 level

Table A-9

Parameter Estimates for Group 2 of the Early/Late Adolescence Model (N = 2302)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother Involvement	0.120	0.014	0.166	0.506	0.047
Rm11: How often is your mother at home when you leave for school?	1.518	0.060	0.742	0.976	0.052
Rm12: How often is your mother at home when you return from school?	1.175	0.044	0.550	1.658	0.037
Rm13: How often is your mother at home when you go to bed?	1.000		0.631	0.786	0.034
Father involvement	0.178	0.025	0.112	2.517	0.059
Rf11: How often is your father at home when you leave for school?	1.000		0.810	1.339	0.046
Rf12: How often is your father at home when you return from school?	0.809	0.010	0.784	1.047	0.034
Rf13: How often is your father at home when you go to bed?	1.106	0.016	0.823	1.482	0.058
Self-esteem					
Pf30: You have a lot of good qualities.	1.000		0.742	0.163	0.007
Pf32: You have a lot to be proud of.	1.179	0.025	0.813	0.142	0.008
Pf33: You like yourself just the way you are	1.341	0.031	0.692	0.389	0.015
Pf34: You feel like you are doing everything just about right.	1.172	0.029	0.651	0.372	0.011
Pf35: You feel socially accepted.	0.985	0.026	0.708	0.192	0.010
Pf36: You feel loved and wanted.	1.026	0.025	0.760	0.153	0.007
Neighborhood	0.063	0.005	0.248	0.060	0.004
Nb1: You know most of the people in your neighborhood.	1.110	0.054	0.643	0.113	0.005
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.827	0.041	0.537	0.109	0.004
Nb3: People in this neighborhood look out for each other.	1.000		0.601	0.114	0.005
Religion	0.224	0.016	0.220	0.986	0.025
Re3: In the past 12 months, how often did you attend religious services?	1.263	0.012	0.936	0.232	0.017
Re4: How important is religion to you?	1.063	0.014	0.837	0.500	0.015
Re7: In the past 12 months, how often did you attend youth activities?	1.000		0.759	0.764	0.017
Other relationships	0.525	0.014	0.899	0.065	0.014
Pr1: How much do you feel that adults care about you?	0.671	0.023	0.540	0.373	0.017
Pr2: How much do you feel that your teachers care about you?	1.000		0.665	0.430	0.018
Pr4: How much do you feel that your friends care about you?	0.530	0.021	0.438	0.404	0.013
Family relationships	0.481	0.012	0.824	0.109	0.012
Pr3: How much do you feel that your parents care about you?	0.243	0.015	0.387	0.106	0.010
Pr5: How much do you feel that people in your family understand you?	1.124	0.032	0.724	0.391	0.017
Pr8: How much do you feel that your parents pay attention to you?	1.000		0.696	0.363	0.016
School belonging	0.358	0.012	0.643	0.182	0.012
Ed19: You feel close to people at your school.	1.000		0.640	0.448	0.016
Ed20: You feel like you are part of your school.	1.124	0.028	0.721	0.363	0.014
Ed22: You are happy to be at your school.	1.269	0.035	0.700	0.520	0.019
Ed23: The teachers at your school treat students fairly.	0.945	0.035	0.534	0.697	0.019
Ed24: You feel safe in your school.	0.869	0.033	0.525	0.616	0.020

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-10

Estimated Factor Variances, Covariances^a, Correlations^b, and Reliabilities^c for the

Delinquency Measurement Model (N = 6504)

Factor	Variance	SE	1	2	3	4	5	6	7	8	9
1	0.785	0.051	.724	0.099	0.075	0.021	0.017	0.032	0.096	0.036	0.004
2	2.555	0.051	.070	.853	0.099	0.032	0.017	0.061	0.193	0.041	-0.002
3	0.361	0.016	.141	.103	.776	0.030	0.040	0.140	0.114	0.126	0.002
4	0.082	0.005	.083	.070	.173	.616	0.008	0.024	0.034	0.026	0.000
5	0.022	0.003	.133	.073	.452	.178	.689	0.045	0.027	0.035	0.001
6	0.183	0.010	.085	.089	.545	.197	.714	.600	0.090	0.096	0.000
7	1.055	0.022	.106	.118	.184	.115	.175	.205	.883	0.061	-0.005
8	0.198	0.008	.090	.057	.472	.202	.528	.506	.134	.869	-0.001
9	0.050	0.006	.020	-.006	.018	.007	.017	.000	-.022	-.013	.622

Note. All variance and covariance estimates were significant at the .01 level. 1 = Maternal Involvement. 2 =

Paternal Involvement. 3 = School Belonging. 4 = Neighborhood Belonging. 5 = Family Relationships. 6 =

Other Relationships. 7 = Religion. 8 = Self Esteem. 9 = Delinquency.

a. Covariances are located in the upper echelon. b. Correlations are located in the lower echelon. c. Reliabilities

are placed on the diagonal, and calculated with the Raykov method (Brown, 2006).

Table A-11

Estimated Factor Variances, Covariances^a, Correlations^b, and Reliabilities^c for the

Depression Measurement Model (N = 6504)

Factor	Variance	SE	1	2	3	4	5	6	7	8	9
1	0.753	0.050	.724	0.091	0.075	0.017	0.072	0.049	0.098	0.036	0.006
2	2.577	0.050	.065	.853	0.096	0.026	0.070	0.081	0.199	0.037	-0.011
3	0.366	0.016	.142	.099	.776	0.027	0.157	0.195	0.113	0.126	0.010
4	0.058	0.003	.081	.066	.183	.616	0.027	0.031	0.031	0.023	0.001
5	0.348	0.015	.141	.073	.441	.188	.689	0.258	0.107	0.139	0.001
6	0.374	0.017	.093	.082	.526	.208	.715	.600	0.131	0.138	0.003
7	1.042	0.021	.111	.121	.183	.124	.177	.209	.883	0.061	-0.013
8	0.203	0.008	.091	.052	.462	.211	.521	.501	.134	.869	0.000
9	0.140	0.008	.019	-.018	.044	.013	.005	.013	-.035	.001	.770

Note. All variance and covariance estimates were significant at the .01 level. 1 = Maternal Involvement. 2 =

Paternal Involvement. 3 = School Belonging. 4 = Neighborhood Belonging. 5 = Family Relationships. 6 =

Other Relationships. 7 = Religion. 8 = Self Esteem. 9 = Depression.

a. Covariances are located in the upper echelon. b. Correlations are located in the lower echelon. c. Reliabilities

are placed on the diagonal, and calculated with the Raykov method (Brown, 2006).

Table A-12

Estimated Factor Variances, Covariances^a, Correlations^b, and Reliabilities^c for the

Substance Use Measurement Model (N = 6504)

Factor	Variance	SE	1	2	3	4	5	6	7	8	9
1	0.786	0.051	.724	0.092	0.074	0.016	0.071	0.024	0.096	0.034	0.001
2	2.566	0.051	.065	.853	0.097	0.027	0.074	0.042	0.191	0.038	-0.019
3	0.351	0.016	.140	.102	.776	0.025	0.155	0.101	0.114	0.123	0.002
4	0.057	0.003	.077	.072	.174	.616	0.027	0.016	0.030	0.022	0.002
5	0.342	0.015	.136	.079	.449	.193	.689	0.125	0.103	0.136	0.004
6	0.094	0.007	.087	.085	.556	.216	.699	.600	0.063	0.068	0.000
7	1.057	0.022	.106	.116	.188	.123	.171	.199	.883	0.061	-0.010
8	0.196	0.008	.086	.053	.468	.206	.524	.502	.135	.869	-0.002
9	0.103	0.006	.004	-.037	.011	.024	.024	-.001	-.030	-.017	.614

Note. All variance and covariance estimates were significant at the .01 level. 1 = Maternal Involvement. 2 =

Paternal Involvement. 3 = School Belonging. 4 = Neighborhood Belonging. 5 = Family Relationships. 6 =

Other Relationships. 7 = Religion. 8 = Self Esteem. 9 = Substance Use.

a. Covariances are located in the upper echelon. b. Correlations are located in the lower echelon. c. Reliabilities

are placed on the diagonal, and calculated with the Raykov method (Brown, 2006).

Table A-13 (cont. on next)

Parameter Estimates for the Delinquency Measurement Model (N = 6504)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother involvement					
Rm11: How often is your mother at home when you leave for school?	1.160	0.022	0.760	0.985	0.041
Rm12: How often is your mother at home when you return from school?	0.923	0.019	0.590	1.596	0.030
Rm13: How often is your mother at home when you go to bed?	0.886	0.029	0.710	0.773	0.028
Father involvement					
Rf11: How often is your father at home when you leave for school?	1.598	0.016	0.807	1.368	0.040
Rf12: How often is your father at home when you return from school?	1.298	0.014	0.783	1.064	0.026
Rf13: How often is your father at home when you go to bed?	1.798	0.019	0.838	1.375	0.052
Self-esteem					
Pf30: You have a lot of good qualities.	0.445	0.009	0.726	0.178	0.006
Pf32: You have a lot to be proud of.	0.540	0.009	0.810	0.153	0.006
Pf33: You like yourself just the way you are	0.625	0.011	0.718	0.368	0.011
Pf34: You feel like you are doing everything just about right.	0.547	0.010	0.670	0.367	0.009
Pf35: You feel socially accepted.	0.469	0.009	0.709	0.218	0.008
Pf36: You feel loved and wanted.	0.474	0.009	0.753	0.171	0.006
Neighborhood					
Nb1: You know most of the people in your neighborhood.	0.286	0.008	0.660	0.106	0.004
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.213	0.007	0.552	0.109	0.003
Nb3: People in this neighborhood look out for each other.	0.233	0.007	0.559	0.119	0.003
Religion					
Re3: In the past 12 months, how often did you attend religious services?	1.315	0.011	0.934	0.253	0.015
Re4: How important is religion to you?	1.114	0.015	0.845	0.498	0.013
Re7: In the past 12 months, how often did you attend youth activities?	1.027	0.011	0.749	0.827	0.014
Other relationships					
Pr1: How much do you feel that adults care about you?	0.428	0.012	0.579	0.362	0.013
Pr2: How much do you feel that your teachers care about you?	0.617	0.014	0.685	0.431	0.015
Pr4: How much do you feel that your friends care about you?	0.311	0.012	0.427	0.435	0.011
Family relationships					
Pr3: How much do you feel that your parents care about you?	0.148	0.010	0.390	0.122	0.009
Pr5: How much do you feel that people in your family understand you?	0.669	0.014	0.722	0.411	0.015
Pr8: How much do you feel that your parents pay attention to you?	0.595	0.013	0.700	0.367	0.013
School belonging					
Ed19: You feel close to people at your school.	0.601	0.013	0.672	0.437	0.013
Ed20: You feel like you are part of your school.	0.683	0.013	0.764	0.333	0.011
Ed22: You are happy to be at your school.	0.732	0.013	0.710	0.527	0.016
Ed23: The teachers at your school treat students fairly.	0.516	0.015	0.521	0.714	0.016
Ed24: You feel safe in your school.	0.478	0.015	0.523	0.606	0.015

Table A-13 (cont.)

Parameter Estimates for the Delinquency Measurement Model (N = 6504)

Delinquency					
Ds2: In the past 12 months, how often did you deliberately damage property that did not belong to you?	0.338	0.014	0.637	0.167	0.008
Ds4: How often did you take something from a store without paying for it?	0.416	0.017	0.563	0.373	0.014
Ds7: How often did you run away from home?	0.112	0.010	0.304	0.123	0.008
Ds14: In the past 12 months, how often did you take part in a fight where a group of your friends was against another group?	0.223	0.013	0.397	0.266	0.010

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-14 (cont. on next)

Parameter Estimates for the Depression Measurement Model (N = 6504)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother involvement					
Rm11: How often is your mother at home when you leave for school?	1.142	0.022	0.753	0.994	0.040
Rm12: How often is your mother at home when you return from school?	0.919	0.019	0.589	1.589	0.030
Rm13: How often is your mother at home when you go to bed?	0.868	0.029	0.703	0.769	0.027
Father involvement					
Rf11: How often is your father at home when you leave for school?	1.605	0.016	0.810	1.347	0.039
Rf12: How often is your father at home when you return from school?	1.301	0.014	0.783	1.070	0.026
Rf13: How often is your father at home when you go to bed?	1.786	0.019	0.833	1.405	0.051
Self-esteem					
Pf30: You have a lot of good qualities.	0.451	0.009	0.735	0.173	0.006
Pf32: You have a lot to be proud of.	0.541	0.009	0.816	0.147	0.006
Pf33: You like yourself just the way you are	0.625	0.011	0.718	0.367	0.011
Pf34: You feel like you are doing everything just about right.	0.539	0.010	0.666	0.364	0.009
Pf35: You feel socially accepted.	0.465	0.009	0.705	0.219	0.008
Pf36: You feel loved and wanted.	0.468	0.009	0.754	0.166	0.006
Neighborhood					
Nb1: You know most of the people in your neighborhood.	0.282	0.008	0.651	0.108	0.004
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.209	0.007	0.533	0.110	0.003
Nb3: People in this neighborhood look out for each other.	0.241	0.007	0.578	0.116	0.004
Religion					
Re3: In the past 12 months, how often did you attend religious services?	1.305	0.011	0.931	0.261	0.015
Re4: How important is religion to you?	1.104	0.015	0.844	0.492	0.013
Re7: In the past 12 months, how often did you attend youth activities?	1.021	0.011	0.746	0.830	0.014
Other relationships					
Pr1: How much do you feel that adults care about you?	0.428	0.012	0.587	0.356	0.013
Pr2: How much do you feel that your teachers care about you?	0.617	0.014	0.681	0.431	0.015
Pr4: How much do you feel that your friends care about you?	0.311	0.012	0.414	0.437	0.011
Family relationships					
Pr3: How much do you feel that your parents care about you?	0.148	0.010	0.394	0.126	0.008
Pr5: How much do you feel that people in your family understand you?	0.669	0.014	0.726	0.407	0.015
Pr8: How much do you feel that your parents pay attention to you?	0.595	0.013	0.696	0.371	0.013
School belonging					
Ed19: You feel close to people at your school.	0.605	0.013	0.677	0.432	0.013
Ed20: You feel like you are part of your school.	0.697	0.013	0.775	0.322	0.011
Ed22: You are happy to be at your school.	0.747	0.013	0.721	0.516	0.016
Ed23: The teachers at your school treat students fairly.	0.516	0.015	0.513	0.722	0.015
Ed24: You feel safe in your school.	0.478	0.015	0.528	0.599	0.015

Table A-14 (cont.)

Parameter Estimates for the Depression Measurement Model (N = 6504)

Depression					
Fs1: You were bothered by things that don't usually bother you.	0.374	0.011	0.567	0.295	0.008
Fs2: You didn't feel like eating, your appetite was poor.	0.295	0.011	0.443	0.358	0.009
Fs3: You felt that you couldn't shake off the blues, even with help from your family.	0.484	0.011		0.197	0.007
Fs6: You felt depressed.	0.582	0.010	0.811	0.177	0.007
Fs9: You thought your life has been a failure.	0.253	0.010	0.522	0.171	0.008
Fs10: You felt fearful.	0.242	0.009	0.454	0.225	0.007
Fs13: You felt lonely.	0.451	0.010	0.664	0.257	0.008
Fs16: You felt sad.	0.467	0.010	0.725	0.196	0.006
Fs19: You felt life was not worth living.	0.222	0.010	0.508	0.142	0.008

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-15 (cont. on next)

Parameter Estimates for the Substance Measurement Model (N = 6504)

Variable	Regression coefficients			Error variance	
	Unstand.	SE	Stand.	Unstand.	SE
Mother involvement					
Rm11: How often is your mother at home when you leave for school?	1.156	0.022	0.760	0.976	0.041
Rm12: How often is your mother at home when you return from school?	0.921	0.019	0.590	1.584	0.030
Rm13: How often is your mother at home when you go to bed?	0.886	0.020	0.713	0.761	0.028
Father involvement					
Rf11: How often is your father at home when you leave for school?	1.602	0.016	0.809	1.353	0.040
Rf12: How often is your father at home when you return from school?	1.302	0.014	0.785	1.058	0.026
Rf13: How often is your father at home when you go to bed?	1.790	0.019	0.834	1.403	0.051
Self-esteem					
Pf30: You have a lot of good qualities.	0.442	0.009	0.724	0.178	0.006
Pf32: You have a lot to be proud of.	0.534	0.009	0.807	0.153	0.006
Pf33: You like yourself just the way you are	0.629	0.011	0.722	0.363	0.012
Pf34: You feel like you are doing everything just about right.	0.547	0.010	0.671	0.365	0.009
Pf35: You feel socially accepted.	0.465	0.010	0.707	0.216	0.008
Pf36: You feel loved and wanted.	0.467	0.009	0.751	0.169	0.006
Neighborhood					
Nb1: You know most of the people in your neighborhood.	0.282	0.008	0.652	0.107	0.004
Nb2: In the past month, you have stopped on the street to talk with someone in your neighborhood.	0.209	0.007	0.533	0.110	0.003
Nb3: People in this neighborhood look out for each other.	0.238	0.007	0.570	0.118	0.004
Religion					
Re3: In the past 12 months, how often did you attend religious services?	1.317	0.011	0.934	0.252	0.015
Re4: How important is religion to you?	1.118	0.015	0.847	0.492	0.013
Re7: In the past 12 months, how often did you attend youth activities?	1.028	0.011	0.749	0.826	0.014
Other relationships					
Pr1: How much do you feel that adults care about you?	0.424	0.012	0.576	0.361	0.013
Pr2: How much do you feel that your teachers care about you?	0.621	0.014	0.691	0.423	0.015
Pr4: How much do you feel that your friends care about you?	0.307	0.012	0.419	0.440	0.011
Family relationships					
Pr3: How much do you feel that your parents care about you?	0.137	0.010	0.367	0.121	0.008
Pr5: How much do you feel that people in your family understand you?	0.666	0.014	0.724	0.403	0.015
Pr8: How much do you feel that your parents pay attention to you?	0.584	0.013	0.691	0.374	0.013
School belonging					
Ed19: You feel close to people at your school.	0.593	0.013	0.666	0.441	0.013
Ed20: You feel like you are part of your school.	0.680	0.013	0.761	0.336	0.012
Ed22: You are happy to be at your school.	0.735	0.013	0.708	0.537	0.016
Ed23: The teachers at your school treat students fairly.	0.524	0.015	0.527	0.716	0.016
Ed24: You feel safe in your school.	0.477	0.015	0.522	0.606	0.015

Table A-15 (cont.)

Parameter Estimates for the Substance Measurement Model (N = 6504)

Substance Use					
To15: During the past 12 months, how many days did you drink alcohol?	0.260	0.008	0.524	0.179	0.004
To31: During your life, how many times have you used marijuana?	0.321	0.009	0.770	0.071	0.006
To35: During your life, how many times have you used cocaine?	0.021	0.003	0.202	0.011	0.001
To38: During your life, how many times have you used inhalants, such as glue or solvents?	0.036	0.004	0.192	0.033	0.002
To41: During your life, how many times have you used any other type of illegal drugs?	0.089	0.005	0.411	0.039	0.002

Note. All regression coefficients and variance estimates were significant at the .001 level.

Table A-16 (cont. on next)

Comparisons for Models of Risk Factor Effects on Negative Outcomes (N = 6504)

Risk Factor	$\chi^2(df)$	$\chi^2_{diff}(df)$	R^2	CFI	RMSEA(.90LL, UL)	SRMR
Delinquency						
Marital Status						
Simple effect ^a	58.904(9)‡		0.049	0.942	0.029(0.022, 0.037)	0.020
Covariates ^b	3224.293(550)‡		0.053	0.849	0.027(0.026, 0.028)	0.038
Mediations ^c	3221.560(548)‡	2.733(2)	0.052	0.849	0.027(0.026, 0.028)	0.038
Disability						
Simple effect ^a	149.480(9)‡		0.035	0.810	0.049(0.042, 0.056)	0.113
Covariates ^b	3249.023(550)‡		0.020	0.847	0.027(0.027, 0.028)	0.044
Mediations ^c	3247.171(548)‡	1.852(2)	0.019	0.847	0.027(0.027, 0.028)	0.038
Family Income*						
Ethnicity						
Simple effect ^a	20.045(9)		0.001	0.983	0.014(0.005, 0.022)	0.014
Covariates ^b	3141.239(550)‡		0.002	0.852	0.027(0.026, 0.028)	0.037
Mediations ^c	3136.859(548)‡	4.380(2)	0.002	0.852	0.027(0.026, 0.028)	0.037
Public Assistance						
Simple effect ^a	98.221(9)‡		0.043	0.897	0.039(0.032, 0.046)	0.031
Covariates ^b	3244.550(550)‡		0.039	0.847	0.027(0.027, 0.028)	0.038
Mediations ^c	3240.311(548)‡	4.239(2)	0.040	0.847	0.027(0.027, 0.028)	0.038
Depression						
Marital Status						
Simple effect ^a	180.128(27)‡		0.001	0.877	0.030(0.026, 0.034)	0.021
Covariates ^b	3485.803(691)‡		0.003	0.847	0.026(0.025, 0.027)	0.035
Mediations ^c	3482.211(689)‡	3.592(2)	0.003	0.847	0.025(0.024, 0.026)	0.035
Disability						
Simple effect ^a	187.871(27)‡		0.001	0.871	0.030(0.026, 0.034)	0.025
Covariates ^b	3494.935(691)‡		0.002	0.846	0.026(0.025, 0.027)	0.036
Mediations ^c	3475.650(689)‡	19.285(2)‡	0.002	0.846	0.025(0.024, 0.026)	0.035
Family Income						
Simple effect ^a	179.297(27)‡		0.008	0.878	0.029(0.025, 0.034)	0.021
Covariates ^b	3532.307(691)‡		0.007	0.845	0.026(0.025, 0.027)	0.035
Mediations ^c	3517.394(689)‡	14.913(2)‡	0.006	0.846	0.025(0.024, 0.026)	0.035
Ethnicity						
Simple effect ^a	178.644(27)‡		0.000	0.878	0.029(0.025, 0.034)	0.021
Covariates ^b	3465.304(691)‡		0.001	0.847	0.026(0.025, 0.027)	0.035
Mediations ^c	3458.811(689)‡	6.493(2)	0.001	0.847	0.025(0.024, 0.026)	0.035
Public Assistance						
Simple effect ^a	178.355(27)‡		0.002	0.878	0.029(0.025, 0.034)	0.021
Covariates ^b	3520.471(691)‡		0.004	0.846	0.026(0.025, 0.027)	0.035
Mediations ^c	3515.421(689)‡	5.050(2)	0.004	0.845	0.025(0.025, 0.026)	0.035
Substance Use						
Marital Status						
Simple effect ^a	184.097(9)‡		0.004	0.871	0.055(0.048, 0.062)	0.114
Covariates ^b	3285.975(550)‡		0.007	0.851	0.028(0.027, 0.029)	0.043
Mediations ^c	3279.699(548)‡	6.276(2)	0.007	0.851	0.028(0.027, 0.029)	0.043
Disability						
Simple effect ^a	187.523(9)‡		0.012	0.869	0.055(0.049, 0.062)	0.116
Covariates ^b	3298.343(550)‡		0.007	0.849	0.028(0.027, 0.029)	0.044
Mediations ^c	3275.006(548)‡	23.337(2)‡	0.009	0.850	0.028(0.027, 0.029)	0.043
Family Income						
Simple effect ^a	191.835(9)‡		0.042	0.866	0.056(0.049, 0.063)	0.117

Table A-16 (cont.)

Comparisons for Models of Risk Factor Effects on Negative Outcomes (N = 6504)

Covariates ^b	3293.825(550)‡		0.042	0.850	0.028(0.027, 0.029)	0.044
Mediations ^c	3282.491(548)‡	11.334(2)†	0.042	0.851	0.028(0.027, 0.029)	0.044
Ethnicity						
Simple effect ^a	184.226(9)‡		0.001	0.870	0.055(0.048, 0.062)	0.114
Covariates ^b	3286.783(550)‡		0.003	0.850	0.028(0.027, 0.029)	0.043
Mediations ^c	3281.377(548)‡	5.406(2)	0.003	0.850	0.028(0.027, 0.029)	0.043
Public Assistance						
Simple effect ^a	204.879(9)‡		0.011	0.862	0.058(0.051, 0.065)	0.113
Covariates ^b	3314.328(550)‡		0.010	0.849	0.028(0.027, 0.029)	0.043
Mediations ^c	3309.416(548)‡	4.912(2)	0.007	0.849	0.028(0.027, 0.029)	0.043

^aModel of Simple effect of risk factor on negative outcome. ^bModel with resilience factors added as covariates. ^cModel with resilience factors as mediators. *Solution was inadmissible.

† $p < .01$. ‡ $p < .001$.

Appendix B

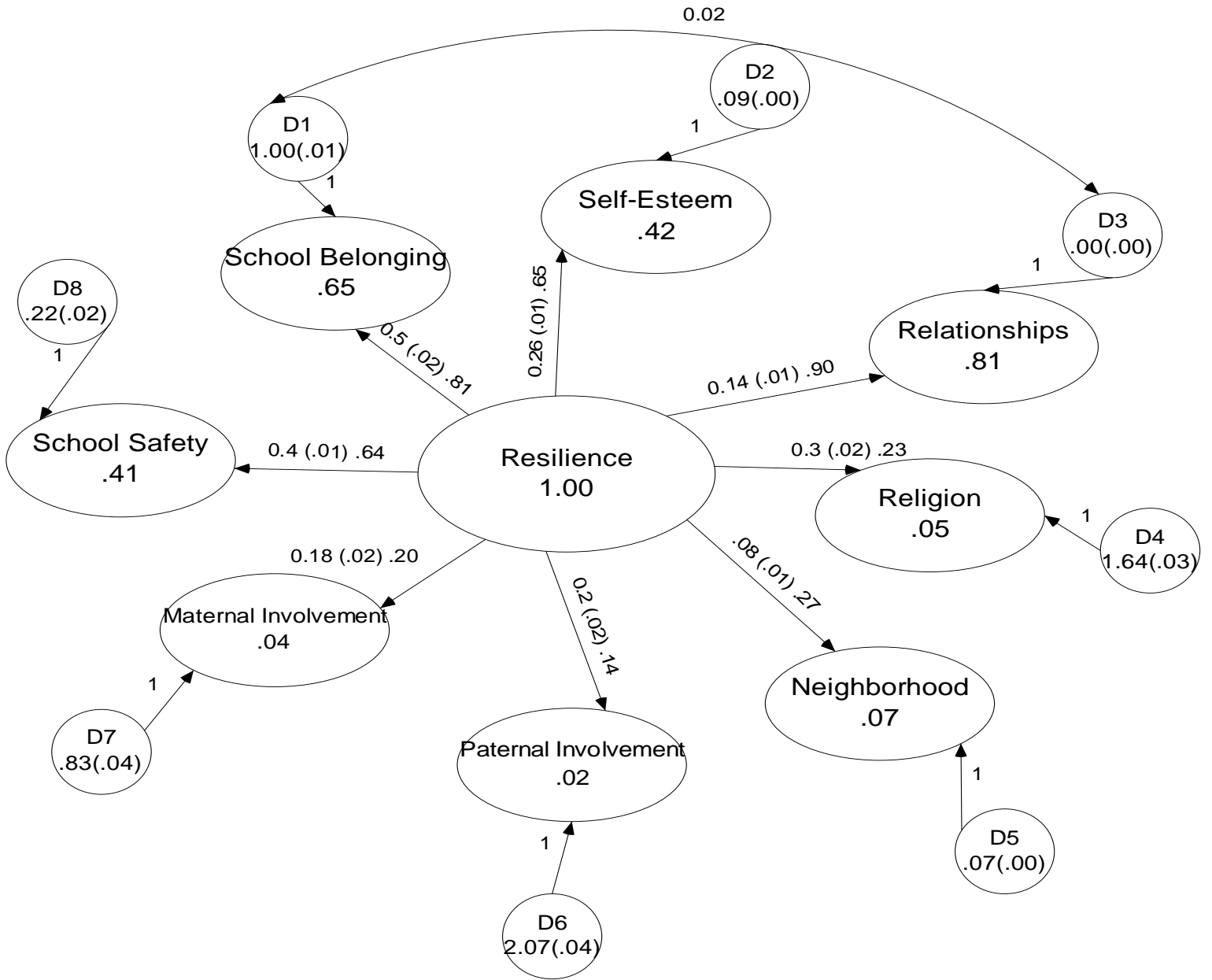


Figure B-1. Diagram of the Final Structural Regression Model ($\chi^2 = 2451.45$, $df = 414$, $p < .01$; CFI = .90; SRMR = .04; RMSEA = .027). Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their *SEs* in parentheses. R^2 values are reported below each latent variable. Unstandardized coefficients are located along each path with *SEs* in parentheses, followed by standardized estimates. Correlations between error terms are also found along each path. ($N = 6544$).

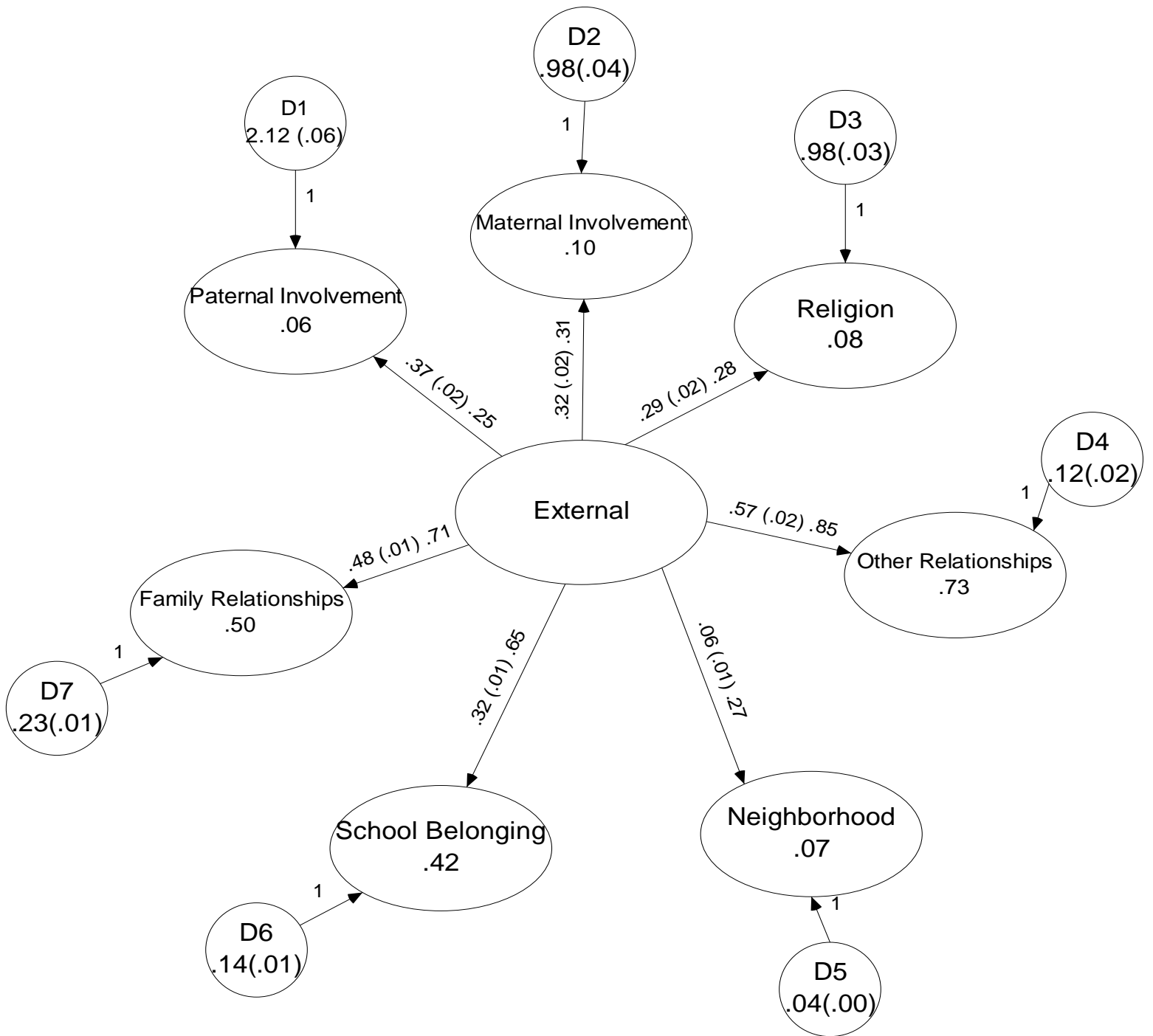


Figure B-2. Diagram of the External Structural Regression Model ($\chi^2 = 3479.46$, $df = 221$, $p < .01$; CFI = .94; SRMR = .04; RMSEA = .047). Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their SEs in parentheses. R^2 values are reported below each latent variable. Unstandardized coefficients are located along each path with SEs in parentheses, followed by standardized estimates. ($N = 6544$).

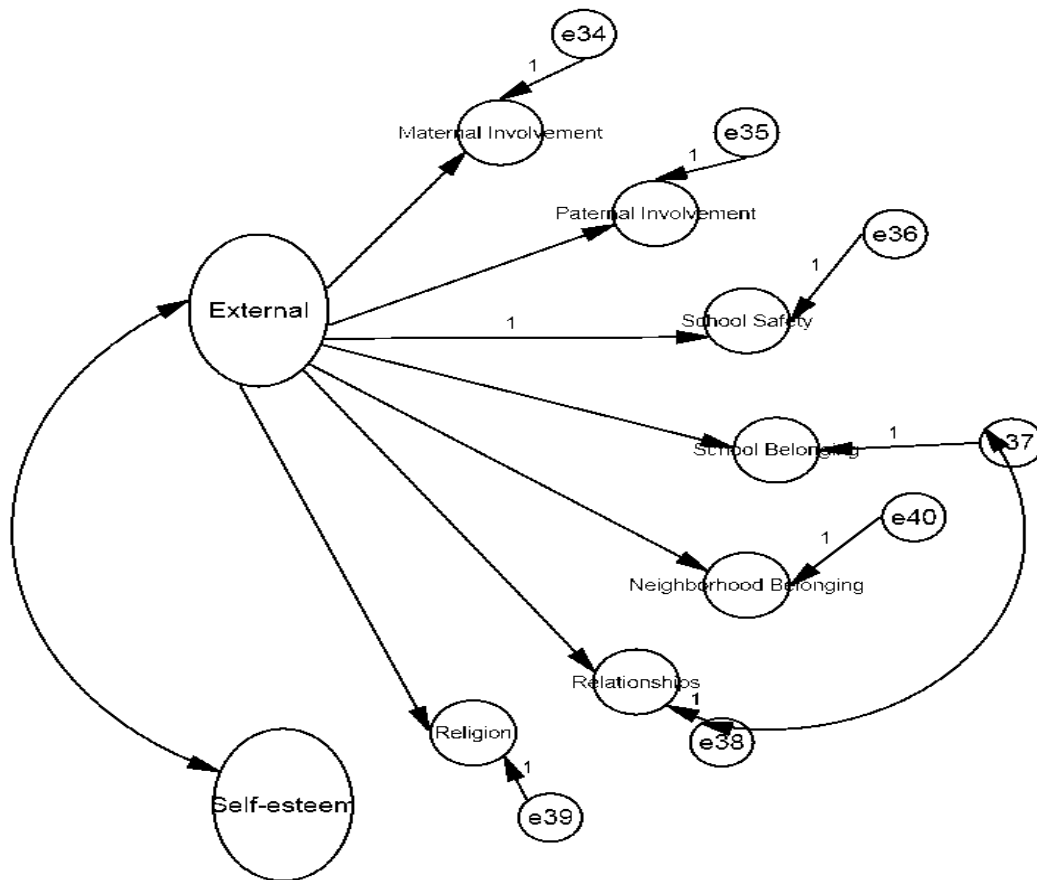


Figure B-3. Two Factor Structural Regression Model

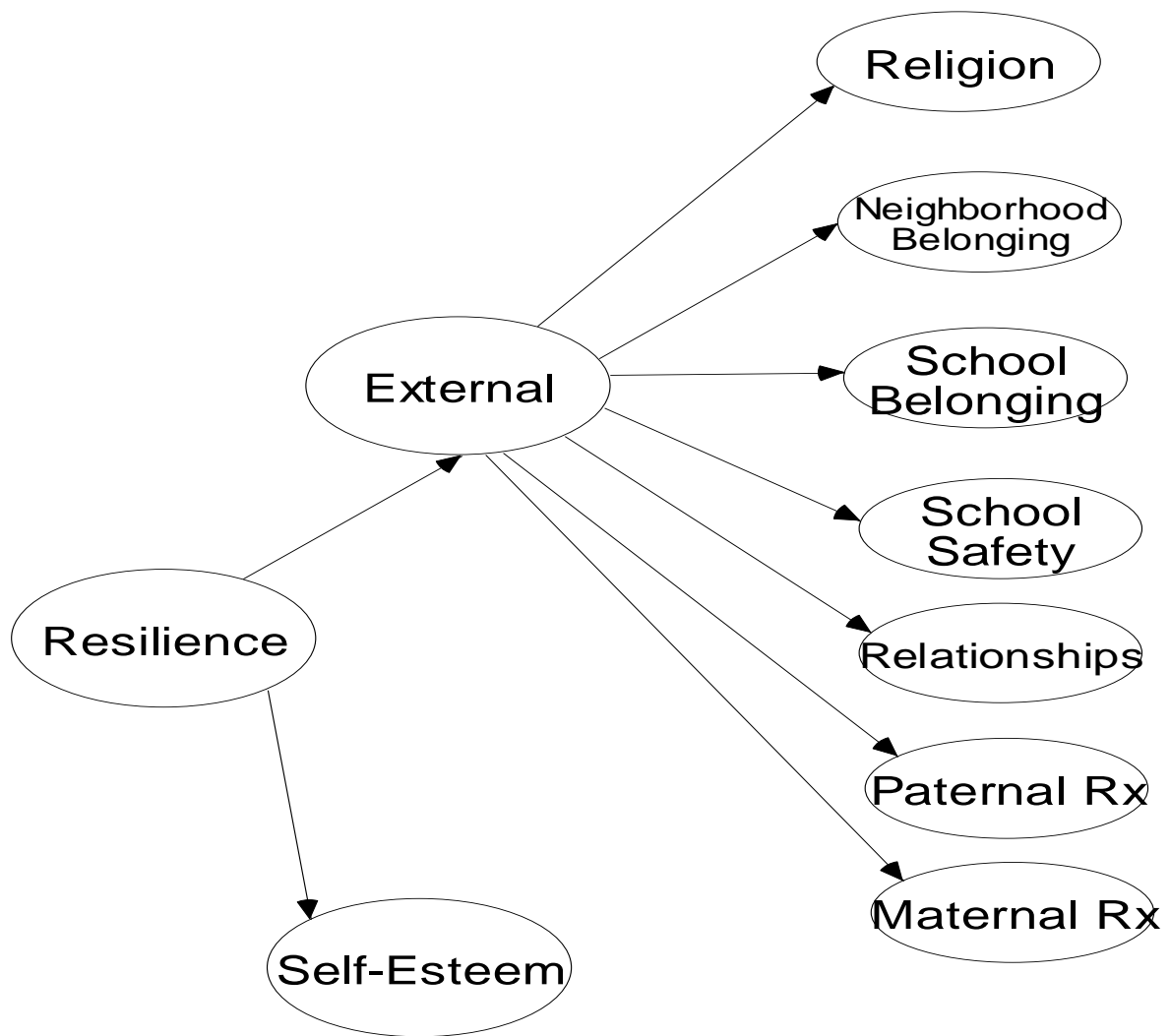


Figure B-4. Three Factor Structural Regression Model



Figure B-5. Diagram of the Structural Part of the Final Structural Regression Model ($\chi^2 = 2823.594$, $df = 369$, $p < .001$; CFI = .849 SRMR = .044; RMSEA = .032). All estimated pathways and correlations were significant at the .001 level. Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their SEs in parentheses. R^2 values are reported within each latent variable. Unstandardized coefficients are located along each path with SEs in parentheses, followed by standardized estimates. Correlations are also found along each path. ($N = 6504$).

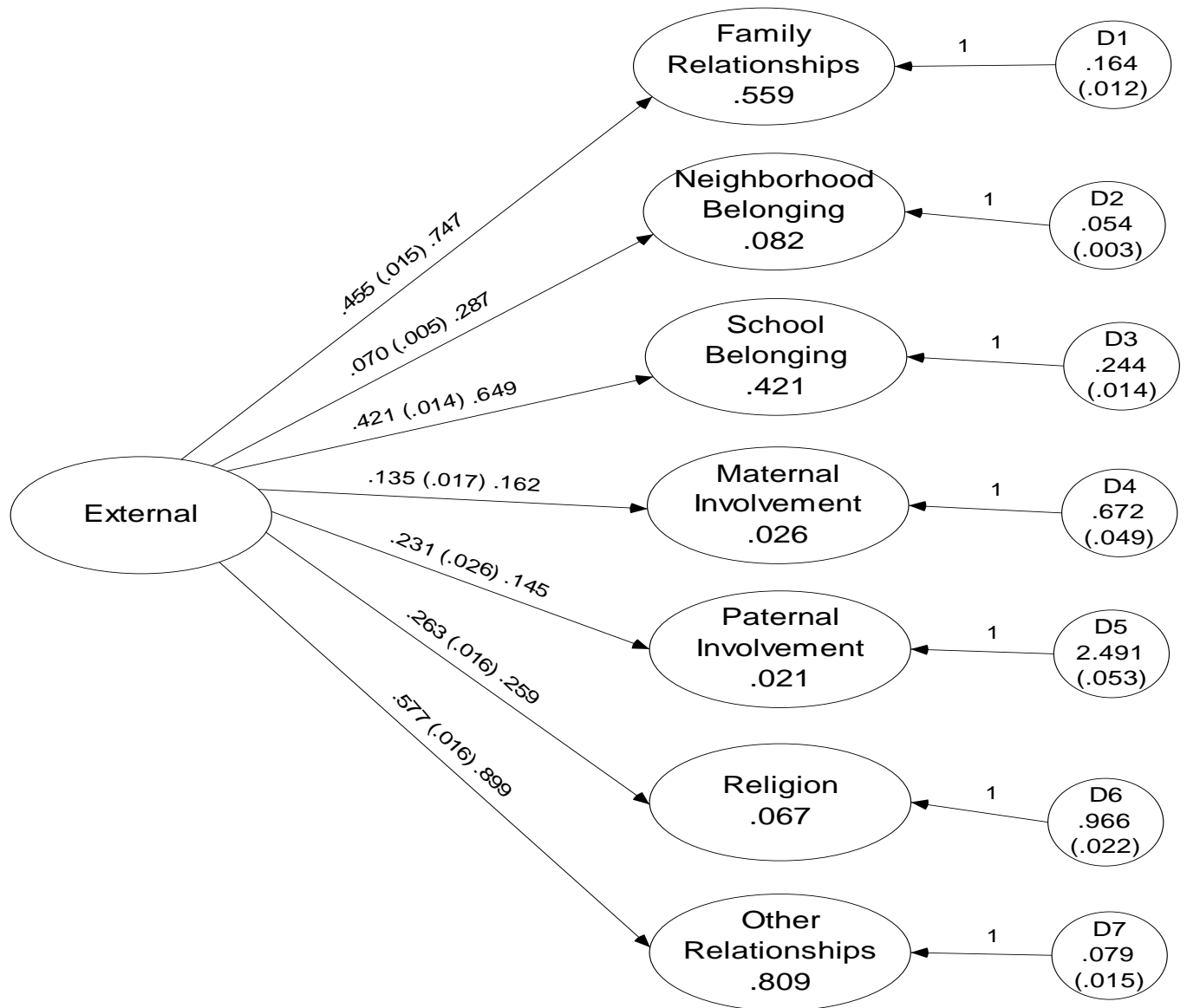


Figure B-6. Diagram of the Structural Part of the Final Structural Regression External

Model ($\chi^2 = 2139.984$, $df = 268$, $p < .001$; CFI = .870 SRMR = .047; RMSEA = .033). All estimated pathways and correlations were significant at the .001 level. Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their SEs in parentheses. R^2 values are reported within each latent variable. Unstandardized coefficients are located along each path with SEs in parentheses, followed by standardized estimates. Correlations between error terms are also found along each path. ($N = 6504$).

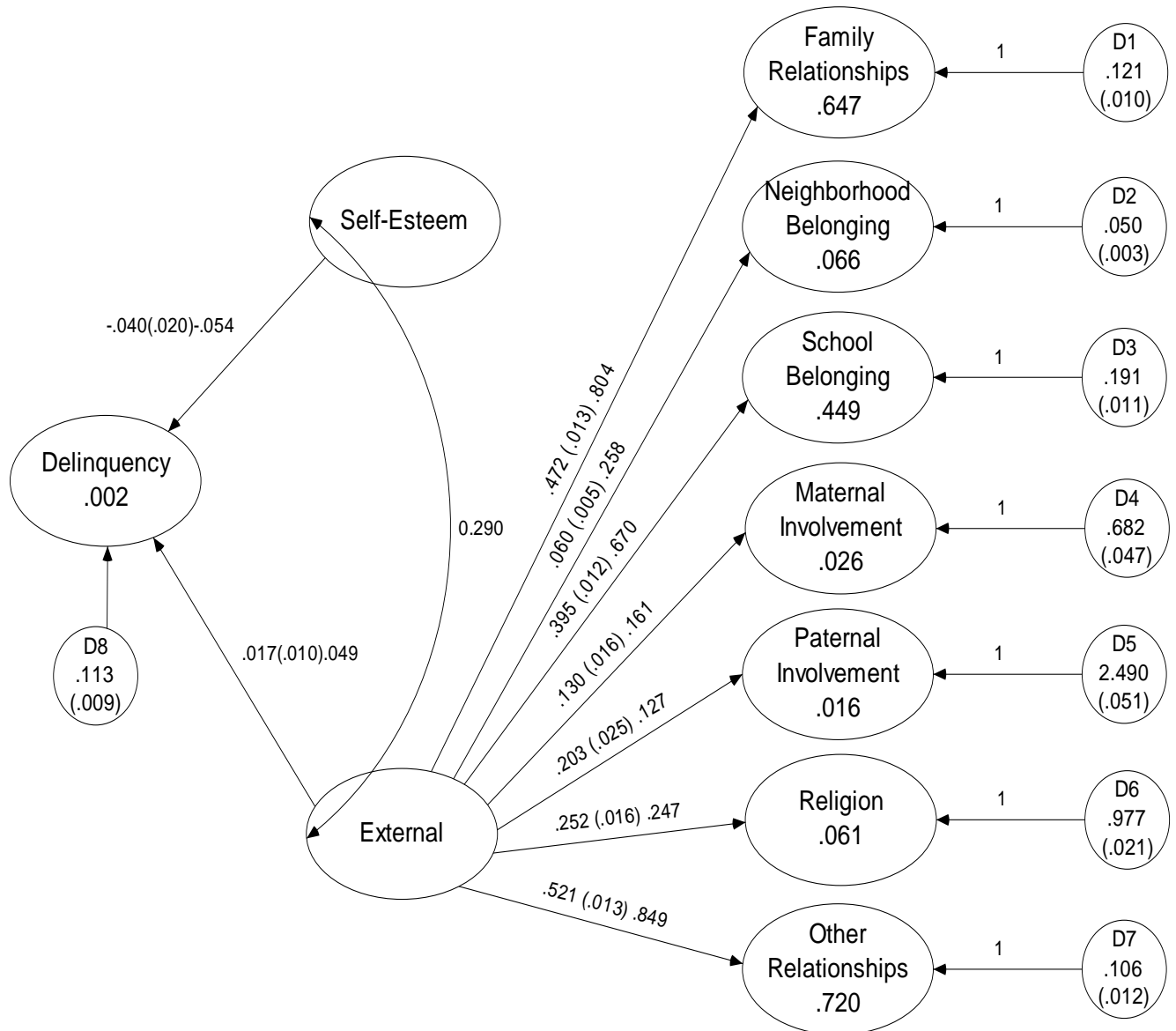


Figure B-7. Diagram of the Structural Part of the Structural Delinquency Model ($\chi^2 = 3087.744$, $df = 517$, $p < .001$; CFI = .852 SRMR = .038; RMSEA = .028). All estimated pathways and correlations were significant at the .001 level. Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their *SEs* in parentheses. *R*² values are reported within each latent variable. Unstandardized coefficients are located along each path with *SEs* in parentheses, followed by standardized estimates. Correlations are also found along each path. ($N = 6504$).

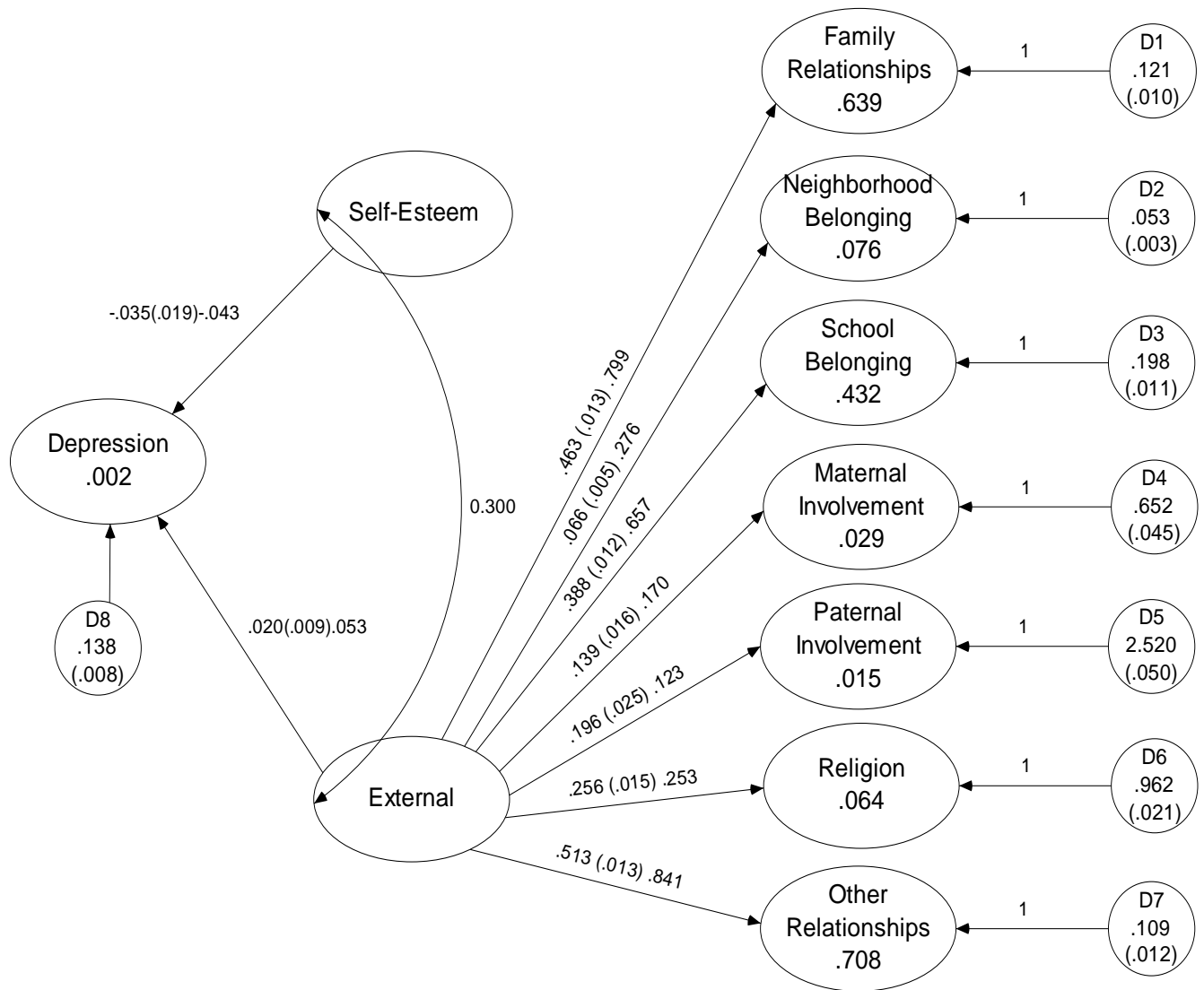


Figure B-8. Diagram of the Structural Part of the Structural Depression Model ($\chi^2 = 3479.118$, $df = 654$, $p < .001$; CFI = .846 SRMR = .036; RMSEA = .026). All estimated pathways and correlations were significant at the .001 level. Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their *SEs* in parentheses. R^2 values are reported within each latent variable. Unstandardized coefficients are located along each path with *SEs* in parentheses, followed by standardized estimates. Correlations are also found along each path. ($N = 6504$).

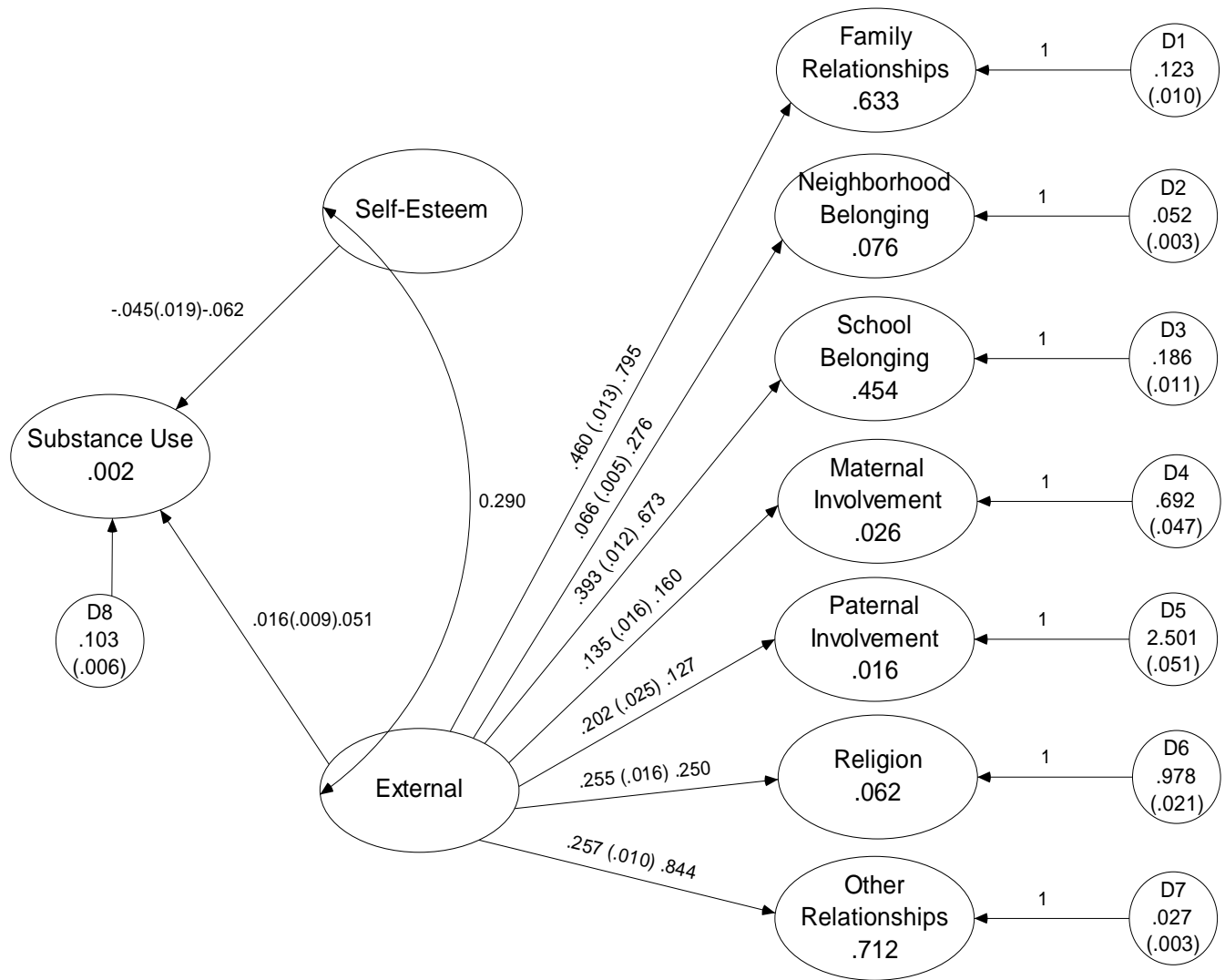


Figure B-9. Diagram of the Structural Part of the Structural Substance Model ($\chi^2 = 3235.379$, $df = 517$, $p < .001$; CFI = .850 SRMR = .044; RMSEA = .028). All estimated pathways and correlations were significant at the .001 level. Disturbances (residual variances) are represented by *D*, and are accompanied by unstandardized estimates and their *SEs* in parentheses. R^2 values are reported within each latent variable. Unstandardized coefficients are located along each path with *SEs* in parentheses, followed by standardized estimates. Correlations are also found along each path. ($N = 6504$).

Appendix C

Resilience Model Items	Response Options	Citations
Sense of belonging/Safety		
School belonging/Safety		
You feel close to people at your school**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Boardman & Saint Onge (2005); Galliher et al. (2004); Regnerus & Elder (2003); Glanville et al. (2008); McKnight & Loper (2002)
You feel like you are part of your school**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Boardman & Saint Onge (2005); Galliher et al. (2004); Regnerus & Elder (2003); Glanville et al. (2008)
Students at your school are prejudiced	1=Strongly agree, 2=Agree, 3=Neither agree or disagree, 4=Disagree, 5=Strongly disagree	Anderman (2002); Boardman & Saint Onge (2005); Galliher et al. (2004)
You are happy to be at your school**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Boardman & Saint Onge (2005); Galliher et al. (2004); Regnerus & Elder (2003); Glanville et al. (2008)
The teachers at your school treat students fairly**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Boardman & Saint Onge (2005); Galliher et al. (2004); McKnight & Loper (2002)
You feel safe in your school**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Boardman & Saint Onge (2005); Galliher et al. (2004)
Neighborhood belonging/Safety		
You know most of the people in your neighborhood**	1=False, 2=True	
In the past month, you have stopped to talk with someone who lives in your neighborhood**	1=False, 2=True	
People in this neighborhood look out for each other**	1=False, 2=True	
Do you usually feel safe in this neighborhood?**	1=False, 2=True	
Internal Qualities/Personality		
Intelligence		

Peabody Picture Vocabulary Test	Standardized score ($M = 100$, $SD = 15$)	
Compared to other people your age, how intelligent are you?	1=Moderately below average, 2=Slightly below average, 3=About Average, 4=Slightly above average, 5=Moderately above average, 6=Extremely above average	
Intrinsic Motivation		
When you get what you want, it's usually because you worked hard for it**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	
Problem Solving		
You usually go out of your way to avoid having to deal with problems in your life	1=Strongly agree, 2=Agree, 3=Neither agree or disagree, 4=Disagree, 5=Strongly disagree	
Difficult problems make you very upset	1=Strongly agree, 2=Agree, 3=Neither agree or disagree, 4=Disagree, 5=Strongly disagree	
When making decisions, you usually go with your "gut" feeling without thinking too much about the consequences of each alternative	1=Strongly agree, 2=Agree, 3=Neither agree or disagree, 4=Disagree, 5=Strongly disagree	
When you are attempting to find a solution to a problem, you usually think of as many different ways to approach the problem as you can**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	
Self-Esteem		
You have a lot of good qualities**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Galliher et al., (2004); Regnerus and Elder (2003); Berg (2003); Daniel & Leaper (2006); Bartlett et al. (2006)
You have a lot to be proud of**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Galliher et al., (2004); Regnerus and Elder (2003); Berg (2003); Daniel & Leaper (2006); Bartlett et al. (2006)
You like yourself just the way you are**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Galliher et al., (2004); Regnerus and Elder (2003); Berg (2003); Daniel & Leaper (2006); Bartlett et al. (2006)
You feel like you are doing everything just about right**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Galliher et al., (2004); Regnerus and Elder (2003); Berg (2003); Daniel & Leaper (2006); Bartlett et al. (2006)
You feel socially accepted**	1=Strongly disagree, 2=Disagree, 3=Neither	Anderman (2002); Galliher et

	agree or disagree, 4=Agree, 5=Strongly agree	al., (2004); Regnerus and Elder (2003); Berg (2003)
You feel loved and wanted**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Anderman (2002); Galliher et al., (2004); Regnerus and Elder (2003); Berg (2003)
Family Support		
Maternal Involvement		
How often is your mother at home when you leave for school?***	1=Never, 2=Almost never, 3=Some of the time, 4=Most of the time, 5=All of the time, 6=She takes me to school*	Benson & Johnson (2009); Aronowitz & Morrison-Beedy (2004)
How often is your mother at home when you return from school?***	1=Never, 2=Almost never, 3=Some of the time, 4=Most of the time, 5=All of the time, 6=She takes me to school*	Benson & Johnson (2009); Aronowitz & Morrison-Beedy
How often is your mother at home when you go to bed?***	1=Never, 2=Almost never, 3=Some of the time, 4=Most of the time, 5=All of the time	Benson & Johnson (2009); Aronowitz & Morrison-Beedy
Paternal Involvement		
How often is your father at home when you leave for school?***	1=Never, 2=Almost never, 3=Some of the time, 4=Most of the time, 5=All of the time, 6=He takes me to school*	Benson & Johnson (2009)
How often is your father at home when you return from school?***	1=Never, 2=Almost never, 3=Some of the time, 4=Most of the time, 5=All of the time, 6=He takes me to school*	Benson & Johnson (2009)
How often is your father at home when you go to bed?***	1=Always, 2=Most of the time, 3=Some of the time, 4=Almost never, 5=Never	Benson & Johnson (2009)
Maternal Relationship		
How close do you feel to your mother?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009); Ford et al. (2003); Aronowitz & Morrison-Beedy (2004); Berg (2003)
How much do you think she cares about you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009); Aronowitz & Morrison-Beedy (2004)
Most of the time, your mother is warm and loving toward you**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Boardman & Saint Onge (2005); Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009); Aronowitz & Morrison-Beedy (2004)
You are satisfied with the way you and your mother communicate with each other**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Boardman & Saint Onge (2005); Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009); Aronowitz &

		Morrison-Beedy (2004)
Overall, you are satisfied with your relationship with your mother**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009); Jaccard et al. (2005); Aronowitz & Morrison-Beedy (2004)
Paternal Relationship		
How close do you feel to your father?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009); Ford et al. (2003); Berg (2003)
How much do you think he cares about you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009)
Most of the time, your father is warm and loving toward you**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009)
You are satisfied with the way you and your father communicate with each other**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009)
Overall, you are satisfied with your relationship with your father**	1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree	Crosnoe & Elder (2004); Brown (2006); Bartlett et al. (2006); Benson & Johnson (2009)
Family Relationships		
How much do you feel that your family pays attention to you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	
How much do you feel that your parents care about you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Boardman & Saint Onge (2005); Crosnoe & Elder (2004); Regnerus & Elder (2003); Wight et al. (2005)
How much do you feel that people in your family understand you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Crosnoe & Elder (2004); Regnerus & Elder (2003); Wight et al. (2005)
Other Supportive Relationship		
How much do you feel that adults care about you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Boardman & Saint Onge (2005); Wight et al. (2005)
How much do you feel that your teachers care about you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Boardman & Saint Onge (2005); Crosnoe & Elder (2004); Wight et al. (2005)
How much do you feel that your friends care about you?	1=Not at all, 2=Very little, 3=Somewhat, 4=Quite a bit, 5=Very much	Boardman & Saint Onge (2005); Wight et al. (2005)

Religion		
In the past 12 months, how often did you attend religious services?***	1=Never, 2=Less than once a month, 3=Once a month or more, but less than once a week, 4=Once a week or more	Boardman & Saint Onge (2005); Glanville et al. (2008); Regnerus & Elder (2003)
How important is religion to you?***	1=Not important at all, 2=Fairly unimportant, 3=Fairly important, 4=Very important	Boardman & Saint Onge (2005); Regnerus & Elder (2003)
In the past 12 months how often did you attend youth activities?***	1=Never, 2=Less than once a month, 3=Once a month or more, but less than once a week, 4=Once a week or more	Glanville et al. (2008)
Personal Goals		
On a scale of 1 to 5, how much do you want to go to college?	1 being lowest – 5 being highest	
On a scale of 1 to 5, how likely is it that you will go to college?	1 being lowest – 5 being highest	

*Indicates an answer of 6 will be scored as a 5

**Indicates the item has been reverse coded from the original items in the Add Health dataset codebooks

Appendix D

Outcome Items	Response Options	Citations
Substance Use		
Have you ever had a drink of beer, wine, or liquor more than 2 or 3 times in your life?	0-no, 1-yes	Boardman & Saint Onge (2005); McKnight & Loper (2002); Aronowitz & Morrison-Beedy (2005)
Do you ever drink beer, wine, or liquor when you are not with your parents or other adults in your family?	0-no, 1-yes	Jaccard et al. (2005)
During the past 12 months, on how many days did you drink alcohol? **	0-0 times, 1-1 to 365 times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
During your life, how many times have you used marijuana? **	0-no, 1-yes	Boardman & Saint Onge (2005); Aronowitz & Morrison-Beedy (2005) McKnight & Loper; Regnerus & Elder (2003);
During your life, how many times have you used cocaine? **	0-no, 1-yes	Boardman & Saint Onge (2005); McKnight & Loper (2002); Regnerus & Elder (2003);
During your life, how many times have you used inhalants, such as glue or solvents? **	0-no, 1-yes	Boardman & Saint Onge (2005); McKnight & Loper (2002)
During your life, how many times have you used any other type of illegal drugs? **	0-no, 1-yes	Boardman & Saint Onge (2005); McKnight & Loper (2002); Regnerus & Elder (2003)
Delinquency		
In the past 12 months, how often did you paint graffiti or signs on someone else's property or in a public place?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Boardman & Saint Onge (2005); Regnerus & Elder (2003); McKnight & Loper (2002); Videon (2002); Brown (2006); Aronowitz & Morrison-Beedy (2005)
In the past 12 months, how often did you deliberately damage property that didn't belong to you?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); McKnight & Loper (2002); Videon (2002); Brown (2006); Wight et al. (2005); Aronowitz & Morrison-Beedy (2005)
In the past 12 months, how often did you lie to your parents or guardians about where you have been or whom you were with?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); McKnight & Loper; Videon (2002); Wight et al. (2005); Aronowitz & Morrison-Beedy (2005)
How often did you take something from a store without paying for it?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Boardman & Saint Onge (2005); Regnerus & Elder (2003); McKnight & Loper; Videon (2002); Brown (2006); Wight et al. (2005); Aronowitz & Morrison-Beedy (2005)

How often did you get into a serious physical fight?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Boardman & Saint Onge (2005); McKnight & Loper; Videon (2002); Brown (2006); Latzman & Swisher (2005); Wight et al. (2005); Aronowitz & Morrison-Beedy (2005)
How often did you hurt someone badly enough to need bandages or care from a doctor or nurse?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	DuBois & Silverthorn (2005); McKnight & Loper; Videon (2002); Brown (2006); Latzman & Swisher (2005); Wight et al. (2005); Aronowitz & Morrison-Beedy (2005)
In the past 12 months, how often did you drive a car without the owner's permission?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
How often did you steal something worth more than \$50?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
How often did you go into a house or building to steal something?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
In the past 12 months, how often did you use or threaten to use a weapon to get something from someone?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
How often did you sell marijuana or other drugs?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
How often did you steal something worth less than \$50?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	
How often did you run away from home?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); McKnight & Loper; Videon (2002); Aronowitz & Morrison-Beedy (2005)
In the past 12 months, how often did you take part in a fight where a group of your friends was against another group?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); McKnight & Loper; Videon (2002); Brown (2006); Latzman & Swisher (2005); Wight et al. (2005); Aronowitz & Morrison-Beedy (2005)
How often did you become loud, rowdy, or unruly in a public place?	0-never, 1-1 or 2 times, 2-3 or 4 times, 3-5 or more times	Regnerus & Elder (2003); Aronowitz & Morrison-Beedy (2005)
Depression -How often was each of the following things true in the past week?		Dubois & Silverthorn (2006) used nine items of the 19 items scale but did not specify which items were used.
You were bothered by things that usually don't bother you.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Boardman & Saint Onge (2005); Brown (2006); Galliher et al. (2004); Videon (2002); Wight et al. (2005)
You didn't feel like eating, your appetite was poor	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or	Anderman (2002); Brown (2006); Galliher et al. (2004); Videon (2002); Wight et al. (2005)

	all of the time	
You felt that you could not shake off the blues, even with help from your family and your friends.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Boardman & Saint Onge (2005); Brown (2006); Galliher et al. (2004); Latzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You felt that you were just as good as other people. *	0-most of the time or all of the time, 1-a lot of the time, 2-sometimes, 3-never or rarely	Boardman & Saint Onge (2005); Brown (2006); Latzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You had trouble keeping your mind on what you were doing.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Brown (2006); Videon (2002); Wight et al. (2005)
You felt depressed.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Boardman & Saint Onge (2005); Brown (2006); Galliher et al. (2004); Latzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You felt that you were too tired to do things.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Brown (2006); Videon (2002); Wight et al. (2005)
You felt hopeful about the future. *	0-most of the time or all of the time, 1-a lot of the time, 2-sometimes, 3-never or rarely	Boardman & Saint Onge (2005); Brown (2006); Latzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You thought your life had been a failure.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Brown (2006); Galliher et al. (2004); Videon (2002); Wight et al. (2005)
You felt fearful.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Brown (2006); Galliher et al. (2004); Videon (2002); Wight et al. (2005)
You were happy. *	0-most of the time or all of the time, 1-a lot of the time, 2-sometimes, 3-never or rarely	Boardman & Saint Onge (2005); Brown (2006); Latzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You talked less than usual.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Brown (2006); Videon (2002); Wight et al. (2005)
You felt lonely.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Brown (2006); Galliher et al. (2004); Latzman & Swisher (2005); Videon (2002); Wight et al. (2005)
People were unfriendly to you.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Brown (2006); Videon (2002); Wight et al. (2005)
You enjoyed life. *	0-most of the time or all of	Boardman & Saint Onge (2005); Brown

	the time, 1-a lot of the time, 2-sometimes, 3-never or rarely	(2006); Lutzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You felt sad.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Boardman & Saint Onge (2005); Brown (2006); Galliher et al. (2004); Lutzman & Swisher (2005); Videon (2002); Wight et al. (2005)
You felt that people disliked you.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Brown (2006); Videon (2002); Wight et al. (2005)
It was hard to get started doing things.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Brown (2006); Videon (2002); Wight et al. (2005)
You felt your life was not worth living.	0-never or rarely, 1-sometimes, 2-a lot of the time, 3-most of the time or all of the time	Anderman (2002); Boardman & Saint Onge (2005); Brown (2006); Galliher et al. (2004); Videon (2002); Wight et al. (2005)

*Indicates item has been reverse coded from the original data in the Add Health codebooks.

** Indicates item response was changed from continuous to categorical.

Appendix E

Covariate Items	Response Options
What is your race?	White, black or African American, Asian or Pacific Islander, American Indian or Native American, other
Do you have difficulty using your hands, arms, legs, or feet because of a permanent physical condition?	Yes/no
What is your current marital status? *	Single(never married), married, widowed, divorced, separated
Are you receiving public assistance such as welfare? *	Yes/no
About how much total income, before taxes, did your family receive in 1994? *	Range from \$0 to \$999 thousand

*Indicates items asked to parents rather than adolescent participants

Appendix F

Covariate-Risk factor	Citation
Participant race – Delinquency	Bartlett et al. (2006); Boardman & Saint Onge (2005); Dubois & Silverthorn (2005); McKnight & Loper (2002); Wight et al. (2005)
Participant race – Substance Use	Bartlett et al. (2006); Boardman & Saint Onge (2005); Dubois & Silverthorn (2005); Wight et al. (2005)
Participant race – Depression	Boardman & Saint Onge (2005); Dubois & Silverthorn (2005); Wight et al. (2005)
Participant disability – Delinquency	Dubois & Silverthorn (2005)
Participant disability – Substance Use	Dubois & Silverthorn (2005)
Participant disability – Depression	Dubois & Silverthorn (2005)
Marital status of parents – Delinquency	Brown (2006); Dubois & Silverthorn (2005); McKnight & Loper (2002); Videon (2002)
Marital status of parents – Substance Use	Dubois & Silverthorn (2005); Videon (2002)
Marital status of parents – Depression	Brown (2006); Dubois & Silverthorn (2005); Videon (2002)
Receiving public assistance – Delinquency	Dubois & Silverthorn (2005); McKnight & Loper (2002); Wight et al. (2005)
Receiving public assistance – Substance Use	Dubois & Silverthorn (2005); Wight et al. (2005)
Receiving public assistance – Depression	Dubois & Silverthorn (2005); Wight et al. (2005)
Income – Delinquency	Aronowitz & Morrison-Beedy (2004); Bartlett et al. (2006); Boardman & Saint Onge (2005); McKnight & Loper (2002); Wight et al. (2005)
Income- Substance Use	Aronowitz & Morrison-Beedy (2004); Bartlett et al. (2006); Boardman & Saint Onge (2005);
Income – Depression	Boardman & Saint Onge (2005); Wight et al. (2005)

Appendix G

Parameter Estimates for the Overall Measurement Model (N = 6504)

Variable	1	2	3	4	5	6	7	8	9	10	11
1 Ed19	1.000	.595**	.487**	.263**	.311**	.011	.040**	.057**	.051**	.071**	.068**
2 Ed20		1.000	.552**	.298**	.344**	.024	.096**	.072**	.062**	.078**	.073**
3 Ed22			1.000	.389**	.402**	.004	.085**	.075**	.068**	.070**	.074**
4 Ed23				1.000	.380**	.006	.044**	.059**	.060**	.051**	.054**
5 Ed24					1.000	.072**	.053**	.036**	.059**	.067**	.037**
6 Peab						1.000	.272**	.043**	-.071**	.024*	.111**
7 Se4							1.000	.028*	-.019	.026*	.056**
8 Rm11								1.000	.459**	.545**	.071**
9 Rm12									1.000	.421**	.047**
10Rm13										1.000	.032*
11 Rf11											1.000
12 Rf12	.065**	.061**	.069**	.063**	.088**	.054**	.015	.040**	.108**	.035**	.639**
13 Rf13	.081**	.079**	.073**	.071**	.088**	.147**	.039**	.046**	.034**	.079**	.676**
14 Pf5	.134**	.161**	.167**	.126**	.113**	.040**	.055**	.505**	.418**	.666**	.034**
15 Pf25	.127**	.138**	.142**	.125**	.121**	.142**	.054**	.053**	.049**	.065**	.699**
16 Pf30	.141**	.204**	.178**	.111**	.121**	.060**	.234**	.059**	.032**	.056**	.027*
17 Pf32	.170**	.270**	.242**	.160**	.148**	.025*	.208**	.054**	.053**	.067**	.043**
18 Pf33	.150**	.202**	.213**	.151**	.136**	-.040**	.123**	.041**	.042**	.044**	.045**
19 Pf34	.162**	.222**	.216**	.184**	.137**	-.036**	.119**	.059**	.045**	.051**	.032**
20 Pf35	.295**	.335**	.272**	.159**	.204**	-.022	.126**	.058**	.028*	.065**	.040**
21 Pf36	.234**	.290**	.251**	.168**	.184**	.027*	.142**	.074**	.072**	.087**	.046**
22 Pr1	.161**	.202**	.172**	.158**	.132**	.019	.087**	.077**	.068**	.092**	.043**
23 Pr2	.265**	.305**	.321**	.371**	.260**	.016	.132**	.038**	.048**	.048**	.074**
24 Pr4	.196**	.181**	.136**	.100**	.148**	.126**	.105**	.051**	.015	.046**	.048**
25 Pr3	.102**	.141**	.138**	.118**	.110**	.060**	.082**	.100**	.084**	.126**	.046**
26 Pr5	.210**	.233**	.232**	.214**	.161**	-.101**	.036**	.081**	.108**	.090**	.059**
27 Pr8	.174**	.230**	.214**	.222**	.173**	-.004	.087**	.112**	.101**	.100**	.065**
28 Nb1	.082**	.100**	.049**	.015	.017	-.076**	-.038**	.041**	.060**	.046**	.027*
29 Nb2	.059**	.080**	.037**	-.016	-.010	-.011	.009	.013	.023	.013	-.004
30 Nb3	.146**	.167**	.145**	.107**	.126**	.020	.032*	.039**	.033**	.047**	.072**
31 Re3	.115**	.151**	.125**	.092**	.051**	.041**	.092**	.065**	.064**	.120**	.083**
32 Re4	.087**	.141**	.118**	.085**	.042**	-.010	.071**	.068**	.077**	.125**	.051**
33 Re7	.092**	.146**	.115**	.089**	.038**	.023	.089**	.071**	.083**	.104**	.070**
34 Ee1	.091**	.156**	.132**	.097**	.109**	.166**	.210**	.036**	-.015	.077**	.052**
35 Ee2	.114**	.178**	.151**	.104**	.145**	.218**	.282**	.055**	-.038**	.083**	.085**
	12	13	14	15	16	17	18	19	20	21	22
1 Ed19	.065**	.081**	.134**	.127**	.141**	.170**	.150**	.162**	.295**	.234**	.161**
2 Ed20	.061**	.079**	.161**	.138**	.204**	.270**	.202**	.222**	.335**	.290**	.202**
3 Ed22	.069**	.073**	.167**	.142**	.178**	.242**	.213**	.216**	.272**	.251**	.172**
4 Ed23	.063**	.071**	.126**	.125**	.111**	.160**	.151**	.184**	.159**	.168**	.158**
5 Ed24	.088**	.088**	.113**	.121**	.121**	.148**	.136**	.137**	.204**	.184**	.132**
6 Peab	.054**	.147**	.040**	.142**	.060**	.025*	-.040**	-.036	-.022	.027*	.019
7 Se4	.015	.039**	.055**	.054**	.234**	.208**	.123**	.119**	.126**	.142**	.087**
8 Rm11	.040**	.046**	.505**	.053**	.059**	.054**	.041**	.059**	.058**	.074**	.077**
9 Rm12	.108**	.034**	.418**	.049**	.032**	.053**	.042**	.045**	.028*	.072**	.068**
10Rm13	.035**	.079**	.666**	.065**	.056**	.044**	.051**	.065**	.087**	.092**	.048**
11 Rf11	.639**	.676**	.034**	.699**	.027*	.043**	.045**	.032**	.040**	.046**	.043**
12 Rf12	1.000	.652**	.049**	.667**	.039**	.043**	.052**	.040**	.037**	.040**	.042**
13 Rf13		1.000	.046**	.856**	.017	.030*	.031*	.036**	.045**	.034**	.033**
14 Pf5			1.000	.136**	.195**	.246**	.216**	.202**	.202**	.310**	.226**

15 Pf25				1.000	.089**	.129**	.122**	.120**	.118**	.151**	.100**
16 Pf30					1.000	.607**	.438**	.395**	.420**	.464**	.215**
17 Pf32							1.000	.530**	.476**	.448**	.564**
18 Pf33							1.000	.558**	.449**	.479**	.184**
19 Pf34								1.000	.465**	.449**	.204**
20 Pf35									1.000	.548**	.232**
21 Pf36										1.000	.338**
22 Pr1											1.000
23 Pr2	.074**	.081**	.128**	.136**	.176**	.236**	.180**	.204**	.198**	.238**	.366**
24 Pr4	.048**	.067**	.097**	.092**	.150**	.160**	.110**	.130**	.213**	.222**	.289**
25 Pr3	.046**	.062**	.272**	.129**	.149**	.216**	.140**	.131**	.156**	.290**	.428**
26 Pr5	.059**	.068**	.304**	.173**	.193**	.293**	.309**	.322**	.280**	.354**	.363**
27 Pr8	.065**	.071**	.307**	.169**	.200**	.297**	.257**	.259**	.245**	.352**	.391**
28 Nb1	.027*	.044**	.069**	.065**	.042**	.066**	.087**	.092**	.103**	.080**	.038**
29 Nb2	-.004	-.001	.024*	.012	.075**	.060**	.057**	.057**	.113**	.080**	.033**
30 Nb3	.072**	.088**	.091**	.123**	.092**	.130**	.095**	.129**	.140**	.131**	.119**
31 Re3	.083**	.089**	.129**	.114**	.091**	.106**	.051**	.043**	.084**	.100**	.115**
32 Re4	.051**	.061**	.149**	.086**	.091**	.125**	.064**	.066**	.096**	.121**	.130**
33 Re7	.070**	.056**	.122**	.090**	.091**	.106**	.071**	.048**	.090**	.105**	.097**
34 Ee1	.052**	.059**	.107**	.086**	.140**	.159**	.075**	.077**	.093**	.122**	.142**
35 Ee2	.085**	.108**	.120**	.130**	.149**	.174**	.090**	.100**	.116**	.154**	.156**
	23	24	25	26	27	28	29	30	31	32	33
1 Ed19	.265**	.196**	.102**	.210**	.174**	.082**	.059**	.146**	.115**	.087**	.092**
2 Ed20	.305**	.181**	.141**	.233**	.230**	.100**	.080**	.167**	.151**	.141**	.146**
3 Ed22	.321**	.136**	.138**	.232**	.214**	.049**	.037**	.145**	.125**	.118**	.115**
4 Ed23	.371**	.100**	.118**	.214**	.222**	.015	-.016	.107**	.092**	.085**	.089**
5 Ed24	.260**	.148**	.110**	.161**	.173**	.017	-.010	.126**	.051**	.042**	.038**
6 Peab	.016	.126**	.060**	-.101**	-.004	-.076**	-.011	.020	.041**	-.010	.023
7 Se4	.132**	.105**	.082**	.036**	.087**	-.038**	.990	.032*	.092**	.071**	.089**
8 Rm11	.038**	.051**	.100**	.081**	.112**	.071**	.013	.039**	.065**	.068**	.071**
9 Rm12	.048**	.015	.084**	.108**	.101**	.060**	.023	.033**	.064**	.077**	.083**
10Rm13	.048**	.046**	.126**	.090**	.100**	.046**	.013	.047**	.120**	.125**	.104**
11 Rf11	.074**	.048**	.046**	.059**	.065**	.027*	-.004	.072**	.083**	.051**	.070**
12 Rf12	.055**	.019	.039**	.074**	.067**	.052**	.007	.078**	.081**	.073**	.072**
13 Rf13	.081**	.067**	.062**	.068**	.071**	.044**	-.001	.088**	.089**	.061**	.056**
14 Pf5	.128**	.097**	.272**	.304**	.307**	.069**	.024*	.091**	.129**	.149**	.122**
15 Pf25	.136**	.092**	.129**	.173**	.169**	.065**	.012	.123**	.114**	.086**	.090**
16 Pf30	.176**	.150**	.149**	.193**	.200**	.042**	.075**	.092**	.091**	.091**	.091**
17 Pf32	.236**	.160**	.216**	.293**	.297**	.066**	.060**	.130**	.106**	.125**	.106**
18 Pf33	.180**	.110**	.140**	.309**	.257**	.087**	.057**	.095**	.051**	.064**	.071**
19 Pf34	.204**	.130**	.131**	.322**	.259**	.092**	.057**	.129**	.043**	.066**	.048**
20 Pf35	.198**	.213**	.156**	.280**	.245**	.103**	.113**	.140**	.084**	.096**	.090**
21 Pf36	.238**	.222**	.290**	.354**	.352**	.080**	.131**	.100**	.121**	.105**	.122**
22 Pr1	.366**	.289**	.428**	.363**	.391**	.038**	.033**	.119**	.115**	.130**	.097**
23 Pr2	1.000	.300**	.236**	.337**	.314**	.041**	.012	.175**	.144**	.148**	.139**
24 Pr4		1.000	.259**	.226**	.253**	.023	.045**	.117**	.033**	.047**	.042**
25 Pr3			1.000	.329**	.398**	.019	.030**	.074**	.091**	.109**	.075**
26 Pr5				1.000	.552**	.083**	.044**	.142**	.105**	.122**	.118**
27 Pr8					1.000	.026*	.030*	.146**	.103**	.111**	.101**
28 Nb1						1.000	.370**	.308**	.058**	.067**	.061**
29 Nb2							1.000	.229**	.037**	.024	.031*
30 Nb3								1.000	.102**	.088**	.094**
31 Re3									1.000	.790**	.699**
32 Re4										1.000	.629**
33 Re7											1.000
34 Ee1	.174**	.122**	.132**	.110**	.137**	-.029*	.013	.050**	.159**	.146**	.141**

35 Ee2	.200**	.162**	.145**	.131**	.175**	-.035**	-.006	.091**	.196**	.171**	.168**
	34	35									
1 Ed19	.091**	.114**									
2 Ed20	.156**	.178**									
3 Ed22	.132**	.151**									
4 Ed23	.097**	.104**									
5 Ed24	.109**	.145**									
6 Peab	.166**	.218**									
7 Se4	.210**	.282**									
8 Rm11	.036**	.055**									
9 Rm12	-.015	-.038**									
10Rm13	.077**	.083**									
11 Rf11	.052**	.085**									
12 Rf12	.034**	.054**									
13 Rf13	.059**	.108**									
14 Pf5	.107**	.120**									
15 Pf25	.086**	.130**									
16 Pf30	.140**	.149**									
17 Pf32	.159**	.174**									
18 Pf33	.075**	.090**									
19 Pf34	.077**	.100**									
20 Pf35	.093**	.116**									
21 Pf36	.122**	.154**									
22 Pr1	.142**	.156**									
23 Pr2	.174**	.200**									
24 Pr4	.122**	.162**									
25 Pr3	.132**	.145**									
26 Pr5	.110**	.131**									
27 Pr8	.137**	.175**									
28 Nb1	-.029*	-.035**									
29 Nb2	.013	-.006									
30 Nb3	.050**	.091**									
31 Re3	.159**	.196**									
32 Re4	.146**	.171**									
33 Re7	.141**	.168**									
34 Ee1	1.000	.697**									
35 Ee2	.697**	1.000									

** Correlation significant at the .01 level. *Correlation significant at the .05 level

Appendix H

Descriptive Statistics for All Items (N = 6504)

Variable	<i>M</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>	<i>Skew</i>	<i>CR^a</i>	<i>Kurtosis</i>	<i>CR^a</i>
Ed19	3.71	.999	1	5	-.802	-26.733	.305	5.000
Ed20	3.85	1.001	1	5	-.969	-3.198	.608	9.967
Ed22	3.68	1.198	1	5	.044	1.467	-.958	-15.705
Ed23	3.48	1.075	1	5	-.780	-26.000	-.099	-1.623
Ed24	3.81	1.014	1	5	-.541	-18.033	-.386	-6.328
Pr2	3.55	.990	1	5	-.384	-12.800	-.132	-2.164
Peabody	10.06	1.475	1	14	-.702	-23.400	2.201	36.082
Se4	3.88	1.094	1	6	.099	3.300	-.641	-10.508
Rm11	3.88	1.571	0	5	-1.281	-42.700	.321	5.262
Rm12	3.09	1.596	0	5	-.372	-12.400	-1.131	-18.541
Rm13	4.40	1.301	0	5	-2.499	-83.300	5.299	86.869
Pf5	4.06	1.314	0	5	-1.880	-62.667	3.015	49.426
Rf11	2.27	1.992	0	5	.194	6.467	-1.572	-25.770
Rf12	1.80	1.668	0	5	.555	18.500	-.950	-15.574
Rf13	3.01	2.157	0	5	-.495	-16.500	-1.530	-25.082
Pf25	2.88	2.050	0	5	-.488	-16.267	-1.476	-24.197
Pf30	4.28	.648	1	5	-.692	-23.067	1.111	18.213
Pf32	4.31	.705	1	5	-1.002	-33.400	1.541	25.262
Pf33	4.02	.942	1	5	-.888	-29.600	.273	4.475
Pf34	3.77	.881	1	5	-.605	-20.167	.075	1.230
Pf35	4.09	.764	1	5	-.986	-32.867	1.731	28.377
Pf36	4.30	.711	1	5	-1.003	-33.433	1.610	26.393
Pr1	4.38	.827	1	5	-1.424	-47.467	2.046	33.541
Pr3	4.79	.568	1	5	-3.384	-112.800	13.349	218.836
Pr4	4.24	.796	1	5	-1.015	-33.833	1.163	19.066
Pr5	3.61	1.009	1	5	-.400	-13.333	-.281	-4.607
Pr8	3.93	.934	1	5	-.698	-23.267	.145	2.377
Nb1	1.73	.442	1	2	-1.046	-34.867	-.900	-14.754
Nb2	1.79	.406	1	2	-1.432	-47.733	.057	.934
Nb3	1.74	.435	1	2	-1.095	-36.500	-.778	-12.754
Re3	2.61	1.429	0	4	-.620	-20.667	-.968	-15.869
Re4	2.90	1.350	0	4	-1.219	-40.633	.217	3.557
Re7	1.94	1.383	0	4	.304	10.133	-1.281	-21.000
Ee1	4.44	1.021	1	5	-1.917	-63.900	2.967	48.639
Ee2	4.16	1.152	1	5	-1.337	-44.567	.903	14.803

*Critical ratios for skewness and kurtosis were calculated by dividing each statistic by its respective standard error. The standard error for skewness was .030 while the standard error for kurtosis was .061.

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