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The Effects of Childhood Adversity, Juvenile Arrest, and Self-Regulation on Adults with Delinquency Histories

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THE EFFECTS OF CHILDHOOD ADVERSITY, JUVENILE ARREST, AND SELF-REGULATION ON YOUNG ADULTS WITH DELINQUENCY HISTORIES

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Michelle-Ann Rhoden

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To: Dean Tomás R. Guilarte
Robert Stempel College of Public Health & Social Work

This dissertation, written by Michelle-Ann Rhoden, and entitled The Effects of Childhood Adversity, Juvenile Arrest and Self-Regulation on Young Adults with Delinquency Histories, having been approved in respect to style and intellectual content, is referred to you for judgment.

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DEDICATION

First, I dedicate this dissertation to God who gives me life and reminds me of my purpose. Next, I dedicate this dissertation to my husband, Vaughn Jr., the love of my life: your support and love kept me grounded during this journey. We share this achievement. In addition, to my parents, who believed in me and nurtured me all my life: I am so grateful you are here to experience our accomplishment. Then, to my siblings, church family, and friends: your prayers and encouragement kept me steadfast in pursuing this goal. I specially want to mention a dear friend, Marva Hare Morris. She cheered me on up to the day before her death. I know she is proud of me right now. Finally, to the individuals who have experienced childhood adversity but are determined to live a resilient life: I am inspired by you.

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ABSTRACT OF THE DISSERTATION

THE EFFECTS OF CHILDHOOD ADVERSITY, JUVENILE ARREST, AND SELF-REGULATION ON YOUNG ADULTS WITH DELINQUENCY HISTORIES

by

Michelle-Ann Rhoden

Florida International University, 2020

Miami, Florida

Professor Hui Huang, Major Professor

Previous studies reported that childhood adversity has debilitating effects on adult well-being. A high prevalence of youths with delinquency histories experience childhood adversity and are at high risk for lasting negative outcomes. Research identifies that the disruption in self-regulation (SR) development explains the effects of childhood adversity on well-being outcomes.

Using data from Add Health, a national study, this dissertation (1) developed a valid and reliable measure of adult SR deficiency, (2) assessed the mediating effects of adult SR deficiency on the association between childhood adversity (i.e., child maltreatment [CM], violent victimization [VV], and economic hardship [EH]) and adult well-being (i.e., mental health problems, alcohol and drug use [AOD], obesity, and criminal behaviors), and (3) evaluated juvenile arrest (JA) as a moderator in the association between childhood adversity and adult SR deficiency among youth with delinquency histories (N=1,792). First, exploratory and confirmatory factor analyses were conducted to develop a measure of adult SR deficiency. Then, mediating effects were tested using structural equation modeling (SEM). Moderating effects were tested using

interaction terms in regression. Results from the factor analyses identified risk-taking, sensation-seeking, impulsivity, and manipulative behaviors as indicators of adult SR deficiency. No mediating or moderating effects were found. However, several direct effects were significant. In the SEM, CM predicted increased mental health problems (β = .144, $p \leq .001$), criminal behaviors (β =.096, $p \leq .001$), and adult SR deficiency (β = .089, $p \leq .001$). VV predicted increased AOD (β = .070, $p \leq .05$) and criminal behaviors (β = .087, $p \leq .01$). EH predicted increased mental health problems (β =.140, $p \leq .001$), but was negatively associated with obesity (β = -.041, $p \leq .05$). In the regression analysis, JA (β =.100, $p \leq .01$), CM (β =.115, $p \leq .001$), and VV (β =.071, $p \leq .05$) predicted increased adult SR deficiency.

Results indicate that unique and shared effects of childhood adversities should be considered when examining the impact on adult well-being. Additionally, results offer support for preventive and trauma-informed services to mitigate the negative effects of childhood adversity and JA. Finally, researchers should consider including manipulative behaviors when measuring SR deficiency.

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ABBREVIATIONS AND ACRONYMS

Add Health	National Longitudinal Study of Adolescent to Adult Health
AVE	Average variance extracted
BMI	Body mass index
AOD	Alcohol and other drug
CES-D	Center for Epidemiologic Studies Depression Scale
CM	Child maltreatment
CFA	Confirmatory factor analysis
CFI	Comparative Fit Index
CR	Composite reliability
EFA	Exploratory factor analysis
EH	Economic hardship
H1, H2, H3	Hypothesis 1, Hypothesis 2, Hypothesis 3
HPA	Hypothalamic-pituitary-adrenocortical axis
JA	Juvenile arrest
LCP	Life course perspective
MLR	Maximum likelihood estimator
PFC	Prefrontal cortex
PSS	Perceived Stress Scale
RMSEA	Root Mean Square Error of Approximation
SEM	Structural equation modeling
SPSS	Statistical Package for Social Science
SR	Self-regulation

SRMR	Standardized Root Mean Square Residual
TLI	Tucker Lewis Index
U.S.	United States
VV	Violent victimization

I. INTRODUCTION

Research Problem

Decades of research have established the pernicious effects of childhood adversity on well-being outcomes, including mental, physical, and behavioral health (Cloitre et al., 2019; Felitti et al., 1998; Kessler et al., 1997; Shook et al., 2011) and crime (Jarjoura et al., 2002; Smith & Thornberry, 1995; Widom, 1989;Widom, 2017). Childhood adversity is defined as exposure to a harmful or potentially harmful life event and/or absence of expected environment stimuli or input that significantly impacts development and functioning (McLaughlin, 2016). Examples of childhood adversity or adverse life events are child maltreatment (CM), violent victimization (VV), and economic hardship (EH). CM includes incidents of sexual, emotional and physical abuse, and neglect of children under 18 years old by a caregiver (Sickmund & Puzzanchera, 2014). VV describes exposure to community violence, outside of the household (e.g., witnessing or having been shot with a gun or stabbed with a knife; Chen et al., 2015). Additionally, EH, which denotes experiences of poverty, refers to inadequate financial resources to meet basic needs like food (Murray et al., 2015). The negative effects of childhood adversity are cumulative (Anda et al., 2006; Baglivio et al., 2014; Connolly & Kavish, 2019) and may continue into adulthood (Cloitre et al., 2019; Putnam et al., 2013).

Childhood adversity increases the risk of delinquent behaviors (Basto-Pereira et al., 2016; Connolly & Kavish, 2019; Reavis et al., 2013). Youth and adults with juvenile delinquency histories are those who have engaged in delinquent behaviors and/or have been arrested before age 18. In the current study, delinquency is defined as criminal offenses committed before 18 years old. These individuals tend to lack protective factors

that could decrease the negative effects of childhood adversity and ultimately increases the risk of poor adult outcomes. For example, they lack school or work engagement and educational attainment (Bender, 2012; Henry et al., 2012; Kent, 2009; Macmillan & Hagan, 2004; Turanovic & Pratt, 2015) and access to supportive and positive relationships (Brook et al., 2013) and are usually exposed to disadvantaged neighborhood conditions of violence, crime, and low socioeconomic circumstances (Brook et al., 2013; Schuck & Widom, 2005; Evans-Chase, 2014).

One explanation for the negative, long-lasting and cumulative effects of childhood adversity is the disruption of self-regulation (SR) development (Evans-Chase, 2014; Ford & Blaustein, 2013; Murray et al., 2015). SR has been identified as an important underlying factor in delinquent, antisocial, and other maladaptive behaviors (such as alcohol and other drug [AOD] use, obesity, depression, stress) over the life course, and has been the target of several interventions (Evans-Chase, 2014; Piquero et al., 2010). Yet, gaps remain in the literature regarding measurement of SR and the impact of adult SR on the association between childhood adversity and adult well-being outcomes like AOD use, obesity, depression, stress, and criminal behaviors on individuals with delinquency histories. In addition, to date, very little is known about the impact of juvenile arrest (JA) on adult SR. The current study seeks to fill the gaps by creating an accurate and reliable measure of adult SR and by examining the effects of childhood adversity, JA, and adult SR on the well-being of young adults with histories of delinquency.

There has been much debate about the malleability, definition, and measurement of SR. Some theorists and researchers believe that SR is relatively fixed and no longer

malleable after childhood or adolescence (Gottfredson & Hirschi, 1990; Hay & Forrest, 2006). Others believe that SR skills develop over an extended period up to young adulthood (Evans-Chase et al., 2013; Steinberg, 2008). Some studies emphasize the influence of social environment (Buker, 2011) and biological functions and processes (Dvir et al., 2014; Perry, 2001; Posner et al., 2013) in the development of self-regulatory skills. SR is described as the act of managing or controlling one's emotional and cognitive processes to achieve a goal-directed action (Murray et al., 2015). Likewise, Buckner and colleagues (2009) defined SR as "an integrated set of abilities or skills that draw from both executive function and emotion regulation capacities, which are … interrelated and act in a collaborative manner when an individual engages in goal-directed behavior" (p.19). A wide range of terms have been used for the set of overlapping and interrelated SR constructs, including self-control, impulsivity, risk-taking, effortful control, cognitive control, emotion or behavior regulation, sensation seeking, behavior inhibition, attentional control, and cognitive flexibility. There have been challenges in consistently and accurately measuring SR given that its theoretical construct is not well-specified. Nevertheless, the fields of criminology and developmental neuroscience emphasize the need for interventions to target SR, especially when concerned with the link between childhood adversity and well-being outcomes.

The present study integrates findings from the literature on childhood adversity, SR, delinquency, and mental, physical, and behavioral health. First, this study will develop a reliable and valid SR scale for young adults who have a history of delinquent behaviors. Second, using the Life Course Perspective (Hutchinson, 2015) and Transdiagnostic model (McLaughlin, 2016) as theoretical frameworks, this study will

examine SR in adulthood as an intervening factor that links childhood adversity to four adult well-being outcomes: mental health problems, AOD use, obesity, and criminal behaviors. This study postulates that childhood adversity compromises the capacity to develop SR skills in adulthood, which then increases the risk of poor adult outcomes. Third, this study will examine the interaction effects of childhood adversity and JA on adult SR capacity. This study assumes that JA will intensify the effects of childhood adversity, which will subsequently disrupt SR capacity in adulthood. To test these hypotheses, a secondary data analysis was conducted using a nationally representative sample of community-based youth in the U.S. The sample was initially interviewed during adolescence and then during adulthood. Only youth who self-reported delinquent behaviors and/or JA were analyzed for this study. Structural equation modeling (SEM) was used to analyze the associations between childhood adversity, adult SR, and adult well-being outcomes. In addition, regression with interaction terms was used to analyze the association between JA, childhood adversity and adult SR in the study.

If SR is found to be a significant intervening mechanism between exposure to childhood adversity (i.e., CM, VV, and EH) and adult well-being outcomes (i.e., mental health problems, AOD use problems, obesity, and criminal behaviors) in adults with history of delinquency, then practitioners could develop interventions that target SR capacities to improve the health and wellness of these young people. Furthermore, if JA is found to be an adverse event that compromises SR in adulthood then juvenile justice administrators and practitioners should explore other meaningful strategies to decrease crime among youth.

Significance of Study

Delinquency is a noteworthy problem in the U.S. In 2016, there were approximately 31 million youth (18 years old and younger) under juvenile court jurisdiction in the U.S. (Hockenberry & Puzzanchera, 2018). They have been detained by police due to the suspicion or conviction of criminal involvement. During the same year, the juvenile courts handled about 2,300 delinquency cases per day which represents 26.9 cases per 1,000 youth in the population older than 10 years old (Hockenberry & Puzzanchera, 2018). Many youth are involved in delinquency yet studies examining their outcomes are limited. Most studies focus on specific U.S. regions (Schubert & Mulvey, 2014; Shufelt & Cocozza, 2006), states (Teplin, et al., 2013), a type of juvenile facility (Ford and Hawke, 2012), or a type of offense (Hunter, 2010; Persons, 2009). The current study examined a nationally representative community-based sample of youth with reported delinquency histories.

Childhood Adversity and Delinquency

Delinquency cases represent a small portion of the youth population, yet there is a higher prevalence of childhood adversity among these youth compared to the general population. They are also more likely to be exposed to multiple types of traumatic events than their counterparts without history of delinquency. Over 90% of youth involved in the justice system reported exposure to one or more childhood adverse or traumatic events (Abram et al., 2004; Baglivio et al., 2014; Dierkhising et al., 2013; Teplin et al., 2013) compared to about 58% of youth (McLaughlin et al., 2012) and 62% of adults (Merrick et al., 2018) in the general population. Some formerly incarcerated adults reported four times more adverse childhood events than a normative nonoffending adult sample in the

U.S. (Reavis et al., 2013). It is well-established that childhood adversity is most prevalent among youth and adults with delinquency histories compared to the general population and consequently, they are a vulnerable population.

Poor Health Outcomes and Criminal Behaviors

In addition to high rates of childhood adversity, youth and adults with delinquency histories also have high rates of mental, physical, and behavioral health problems. Outcome studies of youth and adults with histories of delinquency are heterogenous in nature (i.e., various justice settings, diverse stages of pre-justice and justice process, studies involving states, regions, counties, and communities, self-reported vs. official records), but they consistently report increased risk or occurrence of mental health problems (Abram et al., 2013), substance-related problems (Schubert & Mulvey, 2014), subsequent re-offending (Colman et al, 2009), and weight gain (Gates & Bradford, 2015) among this population.

AOD use, also known as substance use, and mental health problems are common among adults and youth with delinquency. Researchers found that 61-70% of youth with delinquency histories met criteria for at least one psychiatric disorder (including depressive and substance use disorders; Colins et al., 2010; Teplin et al., 2002). Many incarcerated youth and adults have co-occurring mental health and substance use problems (Peter et al., 2012; Ruiz et al., 2012; Shufelt & Cocozza, 2006). In a national study involving 29 juvenile justice facilities across three states, 61% of youth with a history of offending met criteria for co-occurring mental and substance use disorders (Shufelt & Cocozza, 2006). Ruiz et al. (2012) reported that adults with offending and substance use history were five times more likely to exhibit clinically significant

depressive symptoms compared to those without a substance use disorder. Both substance use and mental health problems increase the risk for criminal involvement (Schubert et al., 2011).

Outside of conduct disorder, which by definition is a violation of the basic rights of others and/or societal rules and therefore common in individuals who engage in criminal activities (Schubert & Mulvey, 2014), depressive disorders, anxiety, and substance use disorders are among the most commonly diagnosed disorders in people with offending histories (Colin et al., 2010; Teplin et al., 2002; Schubert & Mulvey, 2014). This is not unusual since depression, anxiety, and AOD use are frequent maladaptive reactions to stress or stressful situations (Wadsworth, 2015) and are indicative of the risky lifestyles led by those involved in criminal activities.

Although physical health problems do not directly relate to criminal behavior or delinquency, youth and adults with histories of delinquency generally present with poorer physical health outcomes and experience more health disparities when compared to peers without histories of delinquency (Freudenberg et al., 2005; Gates & Bradford, 2015). In addition, correctional facilities commonly have high concentrations of people with infectious and chronic diseases (Freudenberg et al., 2005). Chronic diseases such as diabetes and hypertension, which are associated with obesity, a health risk factor, (Siddarth, 2013), are typically found in people with an offending history compared to the general population (Binswanger et al., 2009). According to Gates and Bradford (2015), many individuals enter incarceration overweight and gain weight while incarcerated. Some researchers have proposed that people with an offending history should be considered vulnerable to poor health outcomes since the clear majority of them have

limited access to healthcare prior to incarceration (Gates & Bradford, 2015), poor nutrition habits, limited physical activity while incarcerated, have been exposed to infectious diseases due to risky drug use and sexual behaviors, and have mental health problems which complicate medical treatment (Binswanger et al., 2009).

As it pertains to criminal behavior outcomes, youth who engage in delinquent behaviors have an increased risk of reoffending as an adult (Basto-Pereira & Maia, 2018; Colman, 2009) despite the bell-shaped age trend associated with criminal behaviors (Shulman et al., 2013). The age-crime trend shows that criminal behaviors generally begin in early adolescence, peak in mid-late adolescence and early adulthood, and start decreasing afterwards (Rocque et al., 2016). While it is hopeful that criminal behaviors decrease in adulthood, delinquency in adolescence is still one of the best predictors of future adult crime (Basto-Pereira & Maia, 2018).

Childhood Adversity and Poor Adult Outcomes

Preventing childhood adversity is a protective factor against poor adult health outcomes. According to the Centers for Disease Control and Prevention (2019a) preventing adverse childhood experiences (e.g., CM) could reduce the rates of depression in adults by 44%, health risk behaviors like heavy alcohol drinking by 24%, and obesity or overweight by 2% in the U.S. Using a national survey, Putnam et al. (2013) found that adults with childhood adversity histories (e.g., CM and EH) were more likely to developing two or more adult psychiatric disorders like anxiety and substance use and impulsive behavior problems compared to those without childhood adversity histories. Additionally, childhood adversity increases the risk of future criminal involvement. Widom (2017) found that CM increased the likelihood of an adult arrest by 38%.

In general, it has been well established that there is a high prevalence of youth who engage in delinquent behaviors in the U.S., and most of them have a history of exposure to childhood adversity. Subsequently, childhood adversity has been linked to poor adult health outcomes and criminal behaviors. Therefore, youth with a history of delinquency are vulnerable to long-term poor health outcomes and re-offending behaviors.

Self-Regulation

In addition to childhood adversity, SR is a common theme that permeates the literature on delinquency and well-being outcomes. SR has been viewed as an underlying predictor for multiple negative outcomes including depression, substance-related disorders, weight-related problems (Berking & Wupperman, 2012), and criminal offending (Moffitt et al., 2011). Furthermore, individuals exposed to extensive childhood adversity have reduced self-regulatory capacities relative to their counterparts without childhood adversity (Kim & Cicchetti, 2010). As such, youth with delinquency histories are especially vulnerable to diminished self-regulatory abilities due to their increased risk of adverse childhood experiences, and therefore more likely to have poor adult outcomes.

Juvenile Arrest

Most youth who engage in delinquent behaviors are not arrested by the police (Gomes et al., 2018). However, for those who are arrested, incarceration may heighten the risk for poor outcomes due to possible exposure to physical and sexual violence and other adverse events within detention centers, jails, prisons, or other justice residential facilities (Branson et al., 2017; Levitt, 2010; Mallett, 2015). Beck et al. (2013) found that youths from 16-17 years old were almost twice as likely to experience sexual assault

while incarcerated compared to adults in jails and prisons. In addition, incarcerated youth face stigma and societal sanctions due to labeling (Kirk & Sampson, 2013), alienation from or loss of social ties (Binswanger et al., 2009), and exposure to congregate care (Holman & Ziedenberg, 2006), which all constitute adverse experiences. These adverse events and incidents of victimization may further deteriorate their self-regulatory capacity and overall well-being (Aizer & Doyle, 2015; Jaggers et al., 2016).

Summary. Although several researchers have identified associations between childhood adversity, JA, SR and adult outcomes, very few have tested them within the same model using a longitudinal study of a nationally representative sample of community-based youth with delinquency histories. The current study was designed to address this gap and to provide a comprehensive understanding of the associations between childhood adversity, JA, adult SR, and adult well-being outcomes (i.e., mental health problems, obesity, AOD use, and adult criminal behaviors) within a group of young adults, living in the community, with histories of delinquency. The current study is significant for four main reasons. First, the sample for the current study came from the National Longitudinal Study of Adolescent to Adult Health (Add Health) dataset, which is one of the largest U.S. public datasets following adolescents' lifestyle trajectories (Harris et al., 2009). Most U.S. studies on the long-term outcomes of youth with a history of offending are limited to specific geographic region like Maricopa County, Arizona and Philadelphia County, Pennsylvania in the Pathways to Desistance study (Monahan et al., 2015) or specific states like Illinois (Mersky & Topitzes, 2010; Teplin et al., 2013). Utilizing a nationally representative sample of youth with delinquency histories broadens the impact of the current study's findings. Second, the current study created a valid and

reliable measure of adult SR that can be used for future Add Health studies. Prior to this study no such measure existed within this dataset. Third, the current study examined a broad range of predictors and outcomes in the same conceptual and statistical models compared to other studies (Culhane et al., 2011; Turanovic & Pratt, 2015). The types of childhood adversity assessed were CM, VV, and EH. The adult well-being outcomes examined were mental health problems (i.e., depression and stress), obesity, AOD use, and criminal behaviors. It is common for youth with histories of delinquency to experience multiple adversities, and therefore an evaluation of multiple types of childhood adversity and well-being outcomes is necessary to inform best practices. Fourth, the current study examined the interaction effects of JA and childhood adversity on adult SR. Other studies assessed the opposite sequence (i.e. the impact of SR during childhood or adolescence on adult arrest and/or criminal behaviors (Bender et al., 2010; Moffitt et al., 2011) and thus the impact of JA on adult SR is not well known. However, examining the effects of JA and childhood adversity on adult SR could provide additional insight into the long-term effects of JA.

Overall, national studies examining childhood adversity, JA, adult SR, and adult well-being outcomes among adults with histories of delinquency and/or arrests have been limited. Yet, they are necessary to improve the long-term health and well-being of these youths. With the development of a reliable and valid measure of SR, Add Health researchers will have access to an adult SR scale for future studies. In addition, if SR has an intervening effect on the link between childhood adversity and adult well-being outcomes, then interventions should focus on improving self-regulatory capacity when treating poor adult health outcomes and criminal involvement. Finally, if JA changes the

impact of childhood adversity on adult SR capacity, then juvenile justice practitioners should explore differences in service needs of youth with and without arrest histories.

II. LITERATURE REVIEW

Childhood Adversity, Delinquency, and Adult Outcomes

Child Maltreatment

One of the most widely studied adversities of childhood is CM (previously defined). The first U.S federal child abuse legislation, called the Child Abuse and Prevention Treatment Act of 1974, made CM punishable by law (Scannapieco & Connell-Carrick, 2005). As such, all U.S. states and the District of Columbia have CM reporting laws mandating certain professionals to report suspected maltreatment to government authorities. During 2017, the child protective agencies nationwide received approximately 4.1 million referrals involving about 7.5 million children for suspected CM (U.S. Department of Health & Human Services, 2019). CM impacts many youth but is especially prevalent among those with delinquency histories (English et al., 2002; Mersky & Reynolds, 2007). Chiu et al. (2011) found that youth (5-16 years old) with a verified case of maltreatment were 2.2 times more likely to have a JA than their peers without a verified maltreatment case. The most obvious mechanisms linking maltreatment to delinquency are poor parenting practices and stressful family environments. Youth with maltreatment experiences who later engages in delinquency are typically from homes with little parental supervision, harsh discipline, low socioeconomic status, and parents who struggle with substance use or mental health problems (Farrington, 2010). In fact, numerous studies have consistently identified CM as a predictor of and associated with delinquency (Bender, 2010; Currie & Tekin, 2006; Lantos et al., 2019; Mersky et al., 2012; Trickett et al., 2011).

CM can have enduring effects on an individual's functioning that can last into adulthood (Mersky & Topitzes, 2010). It has been linked to a variety of deleterious adult outcomes including depression, stress, obesity, AOD use (Anda et al., 2010; DeHart et al., 2014; Min et al., 2013; Norman et al., 2012) and criminal behaviors (Colman et al., 2009; Herrenkohl et al., 2017; Mersky & Topitzes, 2010). The mechanisms linking CM to adult outcomes, however, are still not well understood partly due to the complex nature of CM. CM can be a singular incident or something that happens multiple times. Exposure to multiple types or frequent or severe maltreatment increases the risk of negative long-term adult outcomes (Jonson-Reid et al., 2012; LeTendre & Reed, 2017). In a meta-analysis of 184 studies focusing on CM and adult depression, Nelson and colleagues (2017) found that almost half of the adults with depression reported a history of CM and that exposure to multiple types of maltreatment increased the risk of adult depression (odds ratio multiple types = 3.61 vs. odds ratio any one type = 2.81). Some researchers claim that exposure to a specific form of maltreatment predicts certain outcomes more than others. For example, a meta-analysis of 124 studies noted that emotional abuse but not neglect predicted future alcohol use problems (Norman et al., 2012). Other studies found that timing of CM incidents is crucial in predicting adult outcomes (Thornberry et al., 2010). After controlling for the effects of age, biological sex, race, and subsequent maltreatment reports, Kaplow and Widom (2007) found that participants with early initial maltreatment reports (0-5 years old) had higher symptoms of depression and anxiety at age 40 compared to those with later maltreatment (6-11 years old). Moreover, CM sometimes necessitates the need for out-of-home care (i.e., foster care, group home) and child welfare system involvement, which can increase the vulnerability for poor adult

outcomes predominantly due to the experiences of placement instability (Stott, 2012). Individual sociodemographic characteristics (i.e., biological sex) may also influence the pathway of maltreatment to outcomes (Jung et al., 2017). For example, males with CM histories are more likely to be arrested for various types of offenses (i.e., felony, violent, property, drug) and tend to have subsequent arrests compared to females (Colman et al., 2010). While the current literature firmly supports the lasting effects of CM on adult outcomes, the underlying mechanisms are not fully understood partly due to the complex nature of CM.

Violent Victimization

Violence has also been a long-standing societal problem. However, it was not until 1979 that the U.S. Surgeon General publicly addressed violence as a problem affecting the nation's health (Dahlberg & Mercy, 2009). In 1979, the Healthy People report published by the Office of the Assistant Secretary and Surgeon General identified violence as one of 15 priority areas needing attention due to its preventable harmful consequences on the health of the U.S. nation. Since then, the federal government has established centers, programs and research efforts, and appropriated funds to address violence as a public health problem (e.g., National Center for Injury Prevention and Control). VV usually refers to interpersonal violence experienced in one's local community (i.e., a public place outside the household usually by a non-family member) and includes incidents of assault or being threatened with or witnessing violence (i.e., assault with a weapon, gang violence, witnessing others being shot with a gun).

In the 2017-2018 National Survey of Children's Health, a population estimate of 2.8 million children 0-17 years old in the U.S. reported being a victim of or witnessed

violence in his or her community (Child and Adolescent Health Measurement Initiative, n.d.). Adolescents, between the ages of 12-17 years, experience statistically significantly higher rates of VV (2.4%) compared to adults between ages of 25-35 years (1.6%), and 35 years and older (0.9%; Oudekerk & Truman, 2017). In addition, African- Americans (1.6%) are statistically significantly more likely to experience VV compared to Caucasians (1.2%) and Hispanics (1.3%; Oudekerk & Truman, 2017). Likewise, males (1.4%) are statistically significantly more vulnerable to violence compared to females (1.2%; Oudekerk & Truman, 2017). Sometimes these violent acts are fatal. In 2018, homicide was one of the five leading causes of death among youth age 1-17 years (Centers for Disease Control and Prevention, 2020a). Many VV incidents occur on school property or on the way to and from school since most youth attend schools located in their communities. In the National Survey of Children's Exposure to Violence II, 54.3% of youth ages 10-17 experienced victimization at school and 27.4% experienced victimization in their community in the past year (Turner et al., 2016).

Many perpetrators of these violent acts are youth who have also been victims of violence and have experienced multiple types of victimization like maltreatment (Mrug & Windle, 2010; Turner et al., 2016). In a study of 1,354 youth with a history of offending in Philadelphia and Phoenix, 98.6% reported either direct victimization or witnessing community violence (Baskin & Sommers, 2014). High incidents of VV is generally found in youth with offending histories due to predisposed risk factors including deviant peers (Evans et al., 2016), limited family support and supervision (Chung & Steinberg, 2006; Hoeve et al., 2009), living in high-crime low-income neighborhoods (Barnert et al., 2016), and exposure to multiple victimization (Turner et al., 2016). VV is a significant

predictor of poor adult outcomes. In a study with 13,555 participants, Turanovic and Pratt (2015) found that exposure to violent victimization during adolescence significantly contributed to obesity, alcohol and drug use problems, depression, and offending behaviors during adulthood. However, for youth with predisposed risk factors (e.g., youth with offending history), the presence of VV may not worsen poor adult outcomes as they are already acclimated to dealing with problems in their lives (Turanovic, 2019).

Current literature underscores the significance and association of VV among youth with delinquency histories in predicting their adult outcomes. However, research regarding potential pathways that could attenuate the effect of VV on poor adult outcomes of youth with a history of offending still needs investigation due to the layers of associated risk factors and mechanisms.

Economic Hardship

Of the eight adverse childhood experiences (i.e., EH., divorce or separation, exposure to abuse of alcohol or drugs in the household, exposure to neighborhood violence, exposure to household member mental illness or suicidality, death of a household member, exposure to domestic violence, and exposure to family member incarceration) included in a national study, EH was the most common in 47 out of 50 states in the U.S. (Sacks et al., 2014). Economic hardship is often used to depict poverty in the literature (Lefebvre et al., 2017). Nationally, about one in four children younger than age 18 experienced EH somewhat or very often (Sacks et al., 2014). Children under age 18 years are disproportionately living in poverty. In 2018, children under age 18 years represented 22.6% of the general population but 31.1% of those living in poverty (Semega et al., 2019).

EH in childhood is clearly a problem, but more so for those with delinquency histories. A nationwide study found that youth from low-income families compared to middle and high-income families were significantly more likely to engage in risky behaviors such as stealing, property crime, drug use, sex, and alcohol use (Kent, 2009). Additionally, 20% of low-income youth, compared to 16% of middle-income and 12% of high-income youth, were charged with a crime by age 24 (Kent, 2009). As with CM and VV, EH has also been found to be significantly associated with a myriad of adverse outcomes in adulthood including criminal justice involvement (Jaggers et al., 2016), alcohol use (J. M., Najman, Clavarino et al., 2010), mental health problems (Nikulina, et al., 2011), and obesity (Parsons et al., 1999). Furthermore, youth who suffered CM and community violence are often from economically disadvantaged families and backgrounds (Lefebvre et all., 2017; Maguire-Jack & Font, 2017; Wade et al., 2014) and therefore EH most times co-exists with CM and VV.

The pathway from childhood EH to poor adult outcomes has been well-documented but not well understood. Some studies found that the effects of EH on outcomes depends on the duration and timing of poverty (Evans & Kim, 2012; Ratcliffe & McKernan, 2010; Schickedanz et al., 2015; Wagmiller Jr. & Adelman, 2009). Using longitudinal data from a U.S. national representative study, Panel Study of Income Dynamics, participants were followed from 8 years old in 1968 to about 49 years old in 2009 (Shuey & Willson, 2014). Researchers found that the study participants who experienced early and ongoing EH (for at least 10 years) were at greater risk of health-related problems in adulthood compared to those who no longer reported poverty (Shuey & Willson, 2014). Using a sample from the Panel Study of Income Dynamics dataset,

other researchers found that participants who were born into low-income families were more vulnerable to increased adult body mass index compared to those who experienced low income between ages 6-15 even after controlling for the effects of birth year, biological sex, and ethnic background (Ziol-Guest et al., 2009). In an Australian study, researchers concluded that poverty experienced at 14 years old was predictive of adult anxiety and depression compared to poverty experienced within the first year of life (J.M. Najman, Hayatbakhsh et al., 2010). Meanwhile, individuals who experienced poverty at multiple points in their lives had three times the risk of experiencing anxiety and depression in adulthood (J.M. Najman, Hayatbakhsh et al., 2010).

Ratcliffe and McKernan (2010) emphasize the cycle of poverty stating that being born into poverty and spending most of one's childhood years living in poverty is a significant predictor of future poverty and other poor outcomes. Poverty is associated with a cluster of disadvantages such as material and social deprivation (Raphael, 2011), presence of neighborhood disadvantage (Nikulina et al., 2011), and difficulties finding employment (J.M. Najman, Hayatbakhsh et al., 2010) - factors that have also been identified as pathways to poor outcomes. In essence, the pathway from poverty to poor adult outcomes is still quite elusive and thus further exploration into potential intervening factors are needed to inform future treatment and preventative strategies.

Self-Regulation, Delinquency, and Adult Outcomes

As previously mentioned, several terms have been used in the literature to denote SR. However, the most commonly used terms are self-control, impulsivity or impulse control, and sensation-seeking. These terms have been used interchangeably in the literature. SR in the field of criminology became popular with the development of the

theory of self-control in the 1990s. Since then, the Gottfredson and Hirschi's theory of self-control (Pratt & Cullen, 2000) has been well-studied and used in understanding criminal and other analogous behaviors. The theory postulates that low self-control is the key to predicting criminality and other maladaptive behaviors like alcohol and drug use (Buker, 2011; Pratt & Cullen, 2000). Various researchers have investigated and provided evidence for this theory. For example, in a nationally representative study, impulse control problems and sensation-seeking behaviors were significant predictors of delinquency regardless of biological sex and across developmental stages (i.e., from adolescence to adulthood; Peach & Gaultney, 2013). Similarly, the presence of impulsivity significantly increased the likelihood of having a psychiatric disorder, substance abuse disorder, suicidal or self -harming behaviors (Chamorro et al., 2012), and weight problems (Dassen et al., 2018; Fan & Jin, 2013). The premise that SR ability is significantly associated with several adult well-being outcomes has been well-established.

Gottfredson and Hirschi's theory also states that self-control is formed during childhood (usually by age 10) through parental socialization and is stable throughout the life course (i.e., higher levels remain high and lower levels remain low; Buker, 2011). Some researchers have sought to refute this claim as self-control is seen as an executive function of the brain's prefrontal cortex (Jackson & Beaver, 2013; McClelland et al., 2018; Moffitt et al., 2011; Wilson et al., 2011) and therefore malleable during the development of the brain well into young adulthood. In short, the brain maturation up to early adulthood would allow longer time for SR development and therefore longer time for self-regulatory-type intervention efforts. In a study, Diamond and colleagues (2017)

followed 777 kindergartners until about 26 years old and found that, while some participants had relatively stable self-control, 39% showed sizable changes in their self-control with 12% gaining self-control during adulthood. Moffitt et al. (2011) also followed 1000 children from birth to 32 years old to study the impact of self-control on their health and criminal behaviors later in life. They found that self-control improved for some participants from childhood to adulthood and that adult outcomes also improved for those with improved self-control. This provides support for exploring SR intervention strategies during adulthood. Yet, most studies focus on SR during childhood and adolescence. The current study examines SR during adulthood.

Childhood Adversity, Self-Regulation, and Juvenile Arrest

Disruptions in Brain Function

Childhood adversity is associated with poor SR (Meldrum et al., 2019; Murray et al., 2015). Specifically, the literature supports the link between CM (Bunch et al., 2018; Meldrum et al., 2019), VV (Monahan et al., 2015), and EH (Evans & Kim, 2013; Hails et al., 2019; McLaughlin, 2016) and low-level SR. The literature describes the neurophysiological adaptations and disruptions resulting from stress in the brain as one mechanism that could explain the association between childhood adversity and SR (Blair, 2010; McCrory et al., 2011; McCrory et al., 2017; Perry, 2001; Shonkoff et al., 2012). Simply put, stress, a biological response to any intrinsic or extrinsic stimulus (Yaribeygi et al., 2017), produced by prolonged and/or pronounced childhood adverse experiences (or stressors) can change the architecture, chemistry and functioning of the brain involved in SR (Hamoudi et al., 2015; Perry, 2001; Shonkoff & Garner, 2012). JA and incarceration experiences have also been described as stressful and traumatic for youth

(Burrell, 2013) and as such could function as a stressor impacting the brain. SR involves the emotional and cognitive aspects of the brain. Emotionally, one has to actively tolerate or manage feelings and learn adaptive emotional responses in arousing situations when engaging in SR (Murray et al., 2015; Murray et al., 2019). Cognitively, one has to engage in problem solving, decision making, focused attention, attributions and appraisals, and executive functioning processes during self-regulatory behaviors (McClelland et al., 2018; Murray et al., 2015; Murray et al., 2019). Stress is known to alter brain structures and their functioning such as the amygdala, hippocampus, and the prefrontal cortex (PFC) leading to challenges in learning, memory, emotional response and impulse control, decision-making, and executive functioning – all of which are important aspects of SR (Dvir et al., 2014; Hamoudi et al., 2015; McCrory et al., 2017; Moffitt et al., 2011; Shonkoff et al., 2012; Wilson et al., 2011). Simultaneously, stress impacts brain chemistry such as the hypothalamic-pituitary-adrenocortical axis (HPA), which is known to regulate stress hormones to control one's emotional reaction to stressors (Perry, 2001; Wilson et al., 2011). Chronic exposure to adversity may lead to atypical response in the HPA (McCrory et al., 2011).

Several studies have provided evidence indicating the brain mechanism in understanding the relation between childhood adversity and SR (Hanson et al., 2010; McCrory et al., 2017). Using functional magnetic resonance imaging, McLaughlin and colleagues (2015) compared the neurological reactions of adolescent participants (aged 13-19 years) with maltreatment history and those without maltreatment histories engaging in effortful control of emotion during tasks. They found that adolescents with maltreatment histories have significantly greater activation in some regions of the brain

like the amygdala and the PFC used in the effortful regulation of emotional responses to stressful stimuli compared to non-maltreated adolescents. The researchers concluded that adolescents with maltreatment histories use greater brain resources in modulating negative emotional responses thus making them more vulnerable to dysregulation in situations of ongoing stress compared to those without maltreatment history. In another study, Fava et al. (2018) found that the anterior cingulate cortex activity in the brain, collected during an inhibitory control task, was inversely associated with childhood adversity prior to age 11. Inhibitory control tasks are designed to measure an individual's ability to control impulsive responses. The anterior cingulate cortex is connected to the PFC and amygdala and is responsible for decision-making, SR, and assessing the salience of emotional and motivational information (Posner et al., 2007; Stadler et al., 2007; Stevens et al., 2011). Shannon et al., (2011) studied brain activity related to impulsivity in 122 youth who were incarcerated (ages 14-19) in a high-security prison facility. They reported that dorsolateral premotor cortex, responsible for executive functions like working memory, inhibition, and cognitive flexibility was key in predicting impulsivity in participants. Also, they compared functional activity in the dorsolateral premotor cortex between youth who had been incarcerated and 95 typically developing individuals between 7 to 31 years old. Researchers found that less impulsive youth who had been incarcerated generally exhibit similar brain activity as older typical adults and more impulsive youths who had been incarcerated exhibit similar patterns as younger individuals. Some researchers provided a review of studies supporting ongoing dysregulation of the HPA axis and volumetric changes in multiple parts of the brain involved in emotional and cognitive functioning like hippocampus, amygdala, corpus

callosum, PFC, and cerebellum among those who have experienced early adversity (McCrory et al., 2010). In essence, the current literature presents significant evidence for the disruptions in brain function as one mechanism to explain the adversity-regulation connection.

Social Environment and Experiences

Another mechanism connecting childhood adversity to SR is the social environment (Meldrum et al., 2019; Murray et al., 2019). The social environment includes those experiences gained through interacting with others such as parents, peers, teachers, spouses, and mentors. The social experiences are incoming stimuli to the brain to sense, process, store, perceive, interpret, and to act or respond accordingly (Perry, 2006). Incoming stimuli that are safe, stable, and nurturing help the individual to develop neurological capabilities, including SR capacity, which are adaptive and healthy (Perry, 2006). Conversely, stimuli perceived as stressful, threatening, unsafe, and alarming (e.g., EH, CM, and VV) may cause substantial disruptions in regulation and functioning (Evans & Kim, 2012; Murray et al., 2019; Perry, 2006). Youth who experience incarceration are exposed to stressful and threatening social environment in criminal or juvenile justice residential facilities. According to Burrell (2013) a youth who is arrested and subsequently incarcerated is normally separated from natural support systems (e.g., friends, school, and sports) and exposed to negative peer influence, institutional abuse and harassment from staff, physical restraints, and seclusions. Essentially, individuals immersed in a social environment consisting of support, nurture, stability, security, and structure are more likely to develop healthy SR skills compared to those exposed to instability, harsh or inconsistent discipline, insecurity, little positive social support, and

unmet basic needs. SR is learned overtime and largely depends on the structure, support, instruction, modeling, and reinforcement received from the social environment McClelland et al., 2018; Meldrum et al., 2019; Ratchford & Beaver, 2009).

The home and school are the first two and most influential social contexts in developing SR skills. Studies have focused on the impact of positive parenting skills and behaviors in the context of SR development. Using the 4-H Study of Positive Youth Development, researchers assessed the impact of parenting on the SR capacity of 1,574 adolescents in grades 5 to 11 (Bowers et al., 2011). They concluded that youth with the most favorable trajectory of SR development had the highest levels of positive youth development and parental engagement measured by parental school involvement, warmth, and monitoring. Conversely, Lee et al. (2013) examined the Panel Study of Income Dynamics data and found that poverty and other family economic problems were associated with lower levels of self-control and poorer parenting skills. In addition, greater self-control was associated with lower risk of alcohol and marijuana use in adulthood (Lee at al., 2013). Some schools have incorporated social and emotional learning programs, which fundamentally includes learning SR skills, into their curriculum (Jones & Bouffard, 2012) indicating the significance of teachers and peers in SR development.

Murray et al. (2019) discussed another interesting aspect of SR in the social context known as co-regulation. Specifically, caregivers and others such as teachers, childcare providers, mentors, spouses, and peers can promote SR development and skills in the moment by providing co-regulation. Co-regulation can be defined as an interactive process of support within the context of caring relationships across the lifespan (Sbarra &

Hazan, 2008). That is, individuals in the social environment may model, reinforce, provide immediate support and understanding, and instructions in promoting SR skills. Ford and Hawke (2012) implemented and evaluated the effectiveness of Trauma Affect Regulation: Guide for Education and Therapy, essentially a SR intervention, for youth in detention centers with childhood adversity histories. The intervention consisted of peer and staff coaching a form of co-regulation to help promote self-calming techniques and deescalate behavioral dysregulation among the youth. The researchers found that recidivism and punitive actions in the detention facilities significantly reduced after implementation of the intervention. These findings suggest that co-regulation is an important aspect of SR which could potentially lead to a safer, less stressful social environment and positive behavioral outcomes. Overall, the current literature provides compelling support for social environment as another key mechanism that explains the connection between childhood adversity and SR development.

Summary. Delinquency, childhood adversity, SR and adult well-being outcomes are connected. Childhood adversity is particularly high in youth with delinquency histories which makes them vulnerable to poor adult outcomes. In addition, JA exposes youth to added adverse experiences due to their involvement in the justice system. Childhood adversity has been strongly linked to criminal behaviors and poor health outcomes. The disruption in self-regulatory capacity is one pathway used to explain the link between childhood adversity and poor outcomes. Development of SR skills involves brain functions as well as social experiences, both of which are negatively affected by childhood adversity. SR development involves parts of the brain responsible for emotional regulation and executive functioning. In addition, SR capacity depends on

learning and the reinforcement from caregivers and others in the social environment. Generally, childhood adversity occurs in harmful and stressful social environments that disrupts and compromises healthy SR development which in turn increases the risk of poor adult outcomes. The literature also identified that the effects of childhood adversity on adult outcomes may depend on the individual's characteristics (i.e., biological sex, ethnicity, and age).

While the literature seems exhaustive on the negative effects of childhood adversity on outcomes and the role of SR, there are still gaps in understanding how to measure SR capacity and the association between childhood adversity, adult SR, and adult crime and health outcomes among young adults with delinquency histories. This study will integrate these constructs in a single coherent model using data from the Add Health study, which includes a nationally representative community-based sample of youth with reported delinquency histories. Furthermore, the current study will examine the interaction effects of JA and childhood adversity on adult SR capacity.

Theoretical Frameworks

Life Course Perspective (LCP)

LCP provides a helpful theoretical framework to understand the importance of events, experiences and their timing in shaping one's life course. LCP asserts that life events and patterns of experiences from birth changes an individual's role and determines life course or direction (Hutchinson, 2015). Sampson and Laub (2005) applied this developmental perspective to understand crime. This framework posits that the life course is dynamic with multiple events, transitions, interactions, and turning points (Minh et al., 2013; Sampson & Laub, 2005). Fundamentally, LCP states that events or

experiences from birth to death cause transitional changes which carry expectations and preconceptions that ultimately shape current and future strengths and vulnerabilities (Minh et al., 2013). Events may include arrest, experiencing sexual abuse (or any other childhood adversity), or something normative like entering puberty. For example, LCP suggests that a police arrest changes a youth's role from a youth with no arrest to a youth with involvement in the justice system. This transition to a new role or status as *an offender* usually accompanies personal, family, and societal preconceptions, expectations, and challenges which contribute to a life of possible discrimination and other poor outcomes. However, according to LCP, a *turning point* or another transition or event can produce a derailment from the existing life course (Hutchinson, 2015). Lopes et al. (2012) investigated the life course of 1,000 individuals from age 14- 31 to determine the impact of police arrest on adult outcomes. They discovered that police arrest during adolescence predicted police arrest, criminal activities, and drug use between age 21 to 23 years and indirectly predicted drug use between age 29 to 31 years. This is indicative of the cumulative disadvantage and the potential life course that may occur from exposure to a life event- police arrest. In another study, Farrington et al. (2006) found that men who desisted from criminal activities before 21 years old led successful lives (i.e., five years of satisfactory employment, no reported substance use or mental health problems, and no criminal convictions) at 48 years old similar to men without criminal backgrounds. In other words, diverting from a life course can change an individual's future outcomes. McClelland et al. (2018) describes the development of healthy SR skills as a possible turning point for those who would have otherwise exhibited problematic behaviors and poor outcomes due to SR problems.

In keeping with LCP, the current study proposes that youth who have experienced childhood adversity and engaged in delinquent behaviors face cumulative disadvantages and challenges that ultimately result in poor adult outcomes. However, SR can be a possible intervening factor or turning point between adversity and the poor outcomes. In addition, LCP supports the claim that JA is another life event that predicts a life course of poor outcomes.

Transdiagnostic Model

The transdiagnostic model describes common factors explaining the connection between childhood adversity and multiple maladaptive outcomes (see Figure 1). One concept central to the transdiagnostic model is multifinality. Multifinality is the process in which a specific experience or quality increases the risk for multiple types of psychopathology or maladaptive outcomes in individuals (Nolen- Hoeksema & Watkins, 2011). The transdiagnostic model posits that childhood adversity is linked to multiple forms of psychopathology through two main mechanisms or processes: emotional processing and executive functioning (see Figure 1; McLaughlin, 2016), which are proximal risk factors and key components in SR. Proximal risk factors or within-person factors are transdiagnostic processes which are negatively influenced by adverse experiences through learning associations and influencing one's belief systems (McLaughlin, 2016). Essentially, childhood adversity is associated with either a fear, reward, or observation learning response or the deprivation of learning opportunities which subsequently influence the emotional and cognitive responses to the specific stimuli (McLaughlin, 2016). As depicted in the model in Figure 1, emotional processing comprises of the information processing of emotional stimuli and emotional responses.

Meanwhile, the executive functioning includes processes responsible for learning and remembering new information and skills as well as managing and planning goals and actions. CM and VV (i.e., experiences of threat), and EH (i.e., experiences of deprivation) trigger emotional processes and executive functions which are the source of functional impairment and ultimately several poor outcomes such as depression, anxiety, substance use, and behavioral problems (McLaughlin, 2016). In the transdiagnostic model, childhood adversity is seen as a distal risk factor or environmental condition largely outside the child's control that is connected to poor outcomes through intervening proximal risk factors (Nolen-Hoeksema & Watkins, 2011).

Disruptions in emotional and cognitive processes are key to understanding the connection between adversity and types of poor outcomes (Nolen- Hoeksema & Watkins, 2011). Researchers conducted a systematic review of 67 studies to investigate emotional regulation processes as a transdiagnostic factor in different types of maladaptive symptoms like anxiety, depression, substance use, and eating problems (Sloan et al., 2017). The review indicated that in all except two of the studies, emotion regulation difficulties and the use of maladaptive emotional regulation strategies (e.g., rumination, suppression, and avoidance) significantly decreased after treatment, independent of the intervention or symptoms. This review provides support for emotional regulation processes as a common factor across multiple maladaptive behaviors. In another study, Heleniak et al. (2016) found that the disruptions in emotional regulation processes were identified as associated with CM exposure and as transdiagnostic factors connecting CM to multiple types of emotional and behavioral problems. Other researchers provide evidence for adverse childhood experiences negatively affecting executive functioning

(Lambert et al., 2017) and disrupting executive functioning as the basis for multiple poor outcomes (Ehring & Watkins, 2008; Moffitt et al., 2011; Nolen-Hoeksema & Watkins, 2011). In sum, several studies support the transdiagnostic model in explaining SR processes (i.e., emotional processing and executive functioning) as the mechanisms connecting childhood adversity to multiple types of problematic behaviors and poor outcomes.

Research Questions and Hypotheses

The current literature supports the notion that childhood adversity increases the risk for a wide range of poor adult outcomes among youth with delinquency histories. However, SR development could attenuate this negative association. LCP provides the theoretical framework that describes long-term effects of negative life events on an individual's life course. Meanwhile, the transdiagnostic model describes childhood adversity as a distal risk factor associated with different types of mental health problems and behavioral problems indirectly through SR processes. Despite significant support for the link between childhood adversity, SR, and poor adult outcomes, gaps remain in the literature. First, Add Health, one of the most widely used longitudinal datasets does not include a standardized measure for adult SR. Second, to date, no known study has assessed and included in a single model the effects of adult SR on the association between CM, VV, and EH on adult mental health problems, AOD use, obesity, and criminal behaviors using a nationally representative sample of community-based youth with delinquency histories. Finally, to the author's knowledge, no study to date has examined the moderation effects of JA in the association between childhood adversity (i.e., CM, VV, EH) and adult SR deficiency.

Informed by the LCP and transdiagnostic model, the current study will address the gaps in the literature by answering three specific research questions and corresponding hypotheses. Research Question 1: What is the psychometric and latent structure of adult SR deficiency? It is hypothesized (H1) that the SR deficiency measure will contain emotional and cognitive factors, demonstrate adequate reliability, and show good convergent and discriminant validity. Research Question 2: Does adult SR deficiency mediate the association between childhood adversity and adult well-being outcomes? It is hypothesized (H2) that greater incidents of CM, VV, and EH will increase adult SR deficiency, which will lead to higher rates of mental health problems, AOD use, obesity, and criminal behaviors in adulthood. Research Question 3: Does JA moderate the association between childhood adversity and adult SR deficiency? It is hypothesized (H3) that the size of the positive association between CM, VV, EH, and adult SR deficiency will be greater among adults with a JA history than their peers without a JA history. The mediation conceptual framework for Research Question 2 is depicted in Figure 2 and the moderation conceptual framework for Research Question 3 is depicted in Figure 3 .

III. METHODOLOGY

Data Source, Sampling Procedures, and Data Collection

The sample for this study consisted of participants from the Add Health study. The participants were first interviewed as adolescents. The nationally representative sample of adolescents was followed into young adulthood to assess for their overall psychological, social, economic, and physical outcomes in the context of their family, neighborhood, community, school, friendships, peer groups, and romantic relationships (Harris, 2013). Add Health is based on an Integrative Life Course Theoretical Framework which examines the life course of participants' health and well-being in the framework of behavior, context, and biology (Harris, 2013).

The Add Health developers created their study's sample by first sampling schools and then individual student participants (see Figure 4 for details). The researchers obtained the main sampling frame from the Quality Education Database (QED), which consists of 26,666 U.S. High Schools (Chen & Chantala, 2014). High schools were defined as schools having an 11th grade and a population of over 30 students. Using stratified sampling, the schools were sorted by school size, school type, census region, census division, percent Black, percent White, grade span, and level of urbanization (Harris et al., 2009). Eighty high schools were selected which represented 80 communities from the Northeast, South, Midwest, and West regions of the U.S. (Harris et al., 2009). Fifty-two schools agreed to participate, and the remaining 28 schools were selected using a replacement method. The replacement high schools were the next school on the stratified list (which was sorted randomly) following the initial selected high school (Harris et al., 2009). The sorting process was repeated for the selection of the

remaining schools. Next, the final sample of selected high school identified feeder schools with potential students. This is referred to as the high-feeder school pair. The researchers selected feeder schools based on proportional probability to the size of the students entering the connected high school. These feeder schools had at least five prospective junior high or middle school students (Harris et al., 2009). A total of 52 feeder schools were selected (Chen & Chantala, 2014). Overall, 79% of the 132 contacted schools participated. The remaining 21% refused to participate (Chen & Chantala, 2014). There were three types of schools included in the sampling: public, private and parochial (Chen & Chantala, 2014).

Next, Add Health developers created a list of all the students after receiving their caregiver's consent. The researchers collected 90,118 in-school questionnaires from students with consenting parental/legal guardians (Harris et al., 2009). Each school administrators also provided a roster of enrolled students. The researchers created the core and supplemental samples for the in-home interviews by selecting students from the rosters and students who completed the in-school questionnaires but were not on the rosters (Harris, 2013). The core participant sample was randomly selected using stratified sampling after the students in each school were sorted by grade and biological sex (Harris, 2013). About 200 participants were selected from each of the 80 school pairs, totaling 12,105 core participants, which is a nationally representative sample of students in grades 7 to12 in the U.S. between 1994 to 1995 (Harris, 2013; see Figure 4). Other groups, that formed the supplemental samples, were oversampled. Supplementary samples were created for groups like youth with physical disabilities, Cubans, Puerto Ricans, half-siblings, and twins (Harris, 2013). The supplementary samples and core

sample formed the full restricted-use Wave I in-home sample of 20,745 adolescents. The Add Health developers, also, created a public-use sample which includes about one-third of the restricted-use sample and one-half of the core sample selected at random (Harris, 2013). The developers created the public-use dataset to minimize the risk of deductive disclosure (Harris et al., 2009). Figure 4 describes the participants recruited for both the restricted-use and public-use samples. This study includes the public-use sample only.

Add Health is a longitudinal panel study that consists of five Waves of data collected from 1994 to 2019. Wave V is not available within the public dataset for analysis and thus was not included in this study. Participants were interviewed in their home for Wave I to IV data collection (see Figure 4). Wave I responses were collected between 1994 to 1995 and the public dataset included a sample of 6,504 participants (Chen & Chantala, 2014) and approximately 5,700 caregivers. The caregivers were only interviewed in Wave I. Wave II responses were collected in 1996 and included follow-up in-home interviews from 4,834 adolescents (Chen & Chantala, 2014). Wave III responses were collected between 2001 and 2002 and included 4,882 adolescents who had transitioned into adulthood. Wave IV responses on 5,114 participants are included in the sample (Chen & Chantala, 2014). Pre-testing of Wave IV instruments began in 2007 and then the nationwide data collection took place between 2008 and 2009 (Harris, 2013).

All participants provided informed consent before participating in the Add Health study and those over 18 years old at Wave III received monetary incentive payment for their participation (Harris et al., 2009). No incentive was given to participants in other Waves. In an effort to improve the accuracy of self-reported data, the researchers used audio computer-assisted self-interview on laptops to collect sensitive information related

to illegal and health risk behaviors from the participants (Harris, 2013). Other information was collected using computer-assisted personal interviews (Harris, 2013). According to Harris (2013), Add Health developers collected anthropometric measures like height and weight using health-o-meter 844KL digital scale (for weight) as well as steel measure tape and carpenter's square (for height; see Figure 4). In-home interviews took about 90-134 minutes to complete for the adolescent participants and 30 minutes for the caregivers (Harris, 2013). The caregivers completed their interview during Wave I in about 30-minutes (Harris, 2013). The Add Health study obtained Institutional Review Board approval from Institutional Review Board of the University of North Carolina, Chapel Hill. In addition, the Add Health study does not include protected health information and thus not regulated by the Health Insurance Portability and Accountability Act of 1996 (Add Health, n.d.).

For this study, the public-use sample was downloaded from The Inter-university Consortium for Political and Social Research website at https://www.cpc.unc.edu/projects/addhealth/documentation/publicdata. This study received Institutional Review Board exemption approval from the Office of Research Integrity at Florida International University (see Appendix A for approval letter).

Study Participants

The sample for this study was selected through two steps (see Figure 5). First, this study included only participants with a valid Wave IV weight variable, which resulted in 3,342 out of 6,504 adolescents kept in the sample. Second, this study only included adolescents who self-reported delinquent behaviors and/or arrest prior to age 18. These responses were extracted based on a delinquency scale at Wave I and II and items related

to arrest history at Wave IV (see Appendix B for Add Health survey questions). In this study, only serious delinquent behaviors were counted as delinquent behaviors (e.g., stealing, vandalism, and burglary). Minor deviant behaviors such as running away, lying to parents, and acting loud in a public place were not considered delinquent behaviors. The final sample consisted of 1,792 youth with self-reported delinquency and/or arrest histories (see Figure 5).

Measures

The current study consisted of responses from Waves I to IV participants who met the aforementioned inclusion criteria. All survey instruments used in the Add Health study were pilot tested before administration (Udry, 2001). Study variables were determined by following temporal precedence for mediation and moderation tests. According to Baron and Kenny (1986) the predictors must chronologically precede the mediator. Accordingly, the predictors include the three types of childhood adversity: CM, VV, and EH that were experienced before the participant was 18 years old. Next, the mediator must precede the outcome. Therefore, SR deficiency (mediator) was measured between 18-23 years old and the four outcomes: mental health problems, AOD use, obesity, and criminal behaviors were evaluated when participants were 24-30 years (see Figure 2). In moderation analysis, moderators and predictors can be measured at the same time point (Baron & Kenny, 1986). In this study, JA (moderator), which includes arrest experienced before 18 years old, was measured at the same time point as the three types of childhood adversity (predictors) while SR deficiency (outcome) was measured between 18-23 years old (see Figure 3). Demographics such as age, biological sex and ethnicity were collected at Wave I and included as control variables for mediation and

moderation analyses. In addition, Wave III outcome variables (i.e., obesity, mental health problems, AOD use, and criminal behaviors) were also included as control variables for mediation analysis. Add Health survey questions (except for SR which is presented in Appendix C) used for current analyses are presented in Appendix B.

Child Maltreatment (CM; Predictor 1)

CM was determined based on the participant's retrospective self-report of CM by a caregiver before age 18. CM questions were included at Wave III (i.e., inadequate supervision and neglect before sixth grade) and Wave IV (i.e., verbal, physical, and sexual abuse before age 18; see Appendix B). The types of CM covered by these questions are consistent with the literature (Chiu et al., 2011; Hart & Rubia, 2012; Kim & Cicchetti, 2010; Sickmund & Puzzanchera, 2014). Interviewers asked respondents how often they experienced the CM incidents. Responses were judged on a 6-point scale (1= *one time*, 2= *two times*, 3= *three to five times*, 4= *six to 10 times*, 5= *more than 10 times*, and 6= *never*). The never responses were recoded to zero and the responses from CM indicators in Waves III and IV were summed to create an index for the frequency of CM experiences, with higher values representing greater exposure to CM incidents (*M*= 3.61, *SD*= 4).

Violent Victimization (VV; Predictor 2)

VV was determined by participant's reports of exposure to violence or victimization experiences during the past 12 months. Participants responded to five VV questions during Waves I and II (see Appendix B). The questions were, '*During the past 12 months, how often did each of the following things happen*? 1) *you saw someone shoot or stab another person*, 2) *someone pulled a knife or gun on you*, 3) *someone shot you*, 4)

someone cut or stabbed you, and 5) *you were jumped*.' Responses for each question were judged on a 3-point scale (0= *never*, 1= *once*, and 2= *more than once*). The VV questions were similar to questions used by Chen et al. (2015) to measure community violence in their study. For the current study, responses were summed to create a VV index with greater values representing more VV experiences (*M*= 1.04, *SD*= 2.01). The VV measure had a Cronbach's alpha coefficient of .76, which indicates acceptable level of reliability.

Economic Hardship (EH; Predictor 3)

EH was determined by a participant's parent or a household member's report of receiving public assistance in the last month. During the Wave I interview, the youth's parent or guardian responded to questions on the receipt of two types of public assistance like Aid to Dependent Families (AFDC) and food stamps (see Appendix B). Responses for both questions were 0 (*no*) and 1 (*yes*). Summed responses formed the EH index with greater values representing more severe EH (*M*= .20, *SD*= .52). The EH measure had a Cronbach's alpha coefficient of .73, which indicates acceptable level of reliability.

Mental Health Problems (Outcome 1; Latent Variable)

Similar to the Centers for Disease Control and Prevention's healthy day measure (2000), the current study used depression symptoms and stress as indicators of the latent variable on mental health problems. In the Add Health study, depression symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) and stress was measured using the Perceived Stress Scale (PSS; Cohen et al., 1983).

During Wave IV, participants responded to nine questions from CES-D scale such as '*During the past seven days: You were bothered by things that usually don't bother*

you.' The responses were judged on a 4-point scale (0= *never or rarely*, 1= *sometimes*, 2= *a lot of times*, and 3= *most of the time or all of the time*). Responses to three questions were reverse coded so that greater values represented higher levels of depressive symptoms (see Appendix B for questions). Summed responses formed the depression scale (*M* = 5.44, *SD*= 4.35). The depression scale had a Cronbach's alpha coefficient of .84, which indicates good reliability.

The questions from PSS used to measure stress were also selected from Wave IV. Participants responded to four questions from the stress scale such as '*In the last 30 days, how often have you felt that you were unable to control the important things in your life*?' The responses were judged on a 5-point scale (0= *never*, 1= *almost never*, 2= *sometimes*, 3= *fairly often*, and 4= *very often*). The responses to two positive questions were reverse coded so that greater values represented higher levels of perceived stress (see Appendix B for questions). Summed responses formed the stress scale (*M*= 4.89, *SD*= 2.95). The stress scale had a Cronbach's alpha coefficient of .72, which indicates acceptable level of reliability.

Alcohol and Other Drug Use (AOD; Outcome 2)

For this study, AOD use refers to frequency of substance use in the past 12 months. In Wave IV, participants were asked about three categories of substance use: alcohol, marijuana and 'favorite drug.' Favorite drug included use of substances such as sedatives, tranquilizers, stimulants, pain killers, steroids, cocaine, crystal meth, and other illegal drugs (such as lysergic acid diethylamide, phencyclidine, ecstasy, heroin, mushrooms) and inhalants.

Alcohol use was measured by asking participants, '*During the past 12 months, on how many days have you been drunk or very high on alcohol*?' The responses were judged on a 7-point scale (0= *none*, 1= *1 or 2 days in the past 12 months*, 2= *once a month or less*, 3= *2 or 3 days a month*, 4= *1 or 2 days a week*, 5= *3 to 5 days a week*, and 6 = *every day or almost every day*) so that greater values represented more severe alcohol use problems.

Similarly, marijuana use was measured by asking participants, '*During the past 12 months, on how many days did you use marijuana?*' and other drug use was measured by asking participants, '*During the past 12 months, on how many days did you use {favorite drugs}*? The responses to both questions ranged from 0-6 as in alcohol use, as such, higher values represented greater severity in marijuana use and other drug use problems.

The responses from the alcohol use, marijuana use, and other drug use items were combined to form the AOD index (see Appendix B) with greater values representing more severe AOD problems (*M*= 2.51, *SD*= 3.18).

Obesity (Outcome 3)

According to the Centers for Disease Control (2020b), obesity is a high-risk factor for several chronic diseases, cerebrovascular disease, and diabetes. In the current study, body mass index (BMI) was used to measure obesity (see Appendix B). During Wave IV, Add Health developers measured participants height and weight and then calculated the BMI. Weight was measured using a health-o-meter 844KL digital scale and height was measured using a steel measure tape and carpenter's square. The BMI was calculated as weight in kilograms divided by height in meters squared (kg/m^2), and was classified into

six levels (1= *underweight* [16.5 ≤ 18.5], 2= *normal weight* [18.5<25], 3= *overweight* [25 ≤ 30], 4= *obese level I* [30 ≤ 35], 5= *obese level II* [35 ≤ 40], and 6= *obese III* [≥ 40]) according to the National Institutes of Health Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in adults (National Institutes of Health, 1998). For the current study, BMI categories were recoded into 5 levels (0= *normal weight*, 1= *overweight*, 2= *obese I*, 3= *obese II*, and 4 =*obese III*) so that greater values represented more severe obesity (*M*= 1.33, *SD*= 1.28). Underweight was not included in the analysis as the focus of this current study is obesity.[1]

Criminal Behaviors (Outcome 4)

For this study, criminal behavior was measured with participant's response to 14 questions about their criminal involvement in the 12 months preceding Wave IV interview. The 14 questions included theft, property damage, burglary, drug-related charges, and fraud (see Appendix B for survey questions). Twelve of the 14 questions had responses ranging from 0-3 (0= *never*, 1=*1 or 2 times*, 2= *3 or 4 times,* and 3= *5 or more times*). The other two, '*Which of the following things happened in the past 12 months*: 1) *you pulled a knife or gun on someone*, and 2) *you shot or stabbed someone*?' had responses ranging from 0-1 (0= *no* and 1= *yes*). The responses to the 14 questions were summed so that greater values represented higher incidents of criminal behaviors (*M*= .57, *SD*= 1.57). The criminal behaviors measure had a Cronbach's alpha reliability coefficient of .72, which indicates acceptable level of reliability.

[1] Thirty-five or 2% of Wave IV participants were underweight.

Self-Regulation Deficiency (SR; Mediator; Latent Variable)

SR items were selected based on the low self-control measure used by Beaver et al. (2009). Beaver et al. (2009) used Add Health interview questions from Wave III to create a 20-question low self-control measure (Cronbach's alpha of .80; see Appendix C for questions). In the current study, three of the 20 questions were excluded from the SR scale because they were already included in the CES-D scale (i.e., depression measure). The remaining 17 questions were examined using exploratory and confirmatory factor analyses (EFA and CFA; described in analysis section) to arrive at the SR deficiency scale used for this study.

Juvenile Arrest (JA; Moderator)

For this study, JA refers to self-reported police arrest before 18 years old. During Wave IV interviews, participants responded to three questions: 1) *'Have you ever been arrested?* 2) *How old were you (asked to participants with only one arrest)?* and 3) *How old were you the first time you were arrested (asked to participants with multiple arrests)?*' If a participant responded yes to the first question and reported age 17 or younger to either of question two or three, the participant was considered to have a JA history. Otherwise, the participant was considered to have no JA history (see Appendix B for questions).

Control Variables at Wave III

Outcome variables measured at Wave III (i.e., when participants were age 18-23) were included in the mediation analyses to control for their effects on adult well-being outcomes at Wave IV (i.e., when participants were age 24 and older).

Mental Health Problems. Similar to the well-being outcome variable for mental health problems, the control variable for mental health problems represented depression and stress. However, Waves III and IV have slightly different indicators on depression and stress (see Appendix B). For depression, during Wave III, participants responded to eight out of the nine questions from CES-D scale used in Wave IV (see Appendix B). The only exception is that the question, '*You felt happ*y' was not measured in Wave III. Similar to Wave IV CES-D scale, the responses ranged from 0-3 (0= *never or rarely*, 1= *sometimes*, 2= *a lot of times*, and 3= *most of the time or all of the time*) so that greater values represented higher levels of depressive symptoms. Summed responses formed the depression scale (*M*= 4.12, *SD*= 3.74). For stress, the PSS scale used in Wave IV was not included in Wave III. Therefore, stress in Wave III was measured by asking participants, '*In the past 12 months have you taken any prescription medication for depression or stress*.' Those with '*0*' responses were coded '*no*' and those with '*1*' responses were coded as '*yes*' for this variable so that greater values represented more severe problems with depression or stress (*M*= .05, *SD*= .22).

Alcohol and Drug Use Problem. In Wave III, participants were asked about their use of seven types of substances like alcohol, anabolic steroids or other illegal performance enhancing substances for athletes, marijuana, any kind of cocaine, crystal meth, injected illegal drug use, and other types of illegal drugs (i.e., lysergic acid diethylamide, phencyclidine, ecstasy, mushrooms, ice, and heroin; see Appendix B).

Each type of substance use (except alcohol) was measured by asking participants about their substance use in the past year (see Appendix B). Responses were coded as 0= *no substance use problem* and 1= *yes substance use problem*. For alcohol, participants

were asked about getting drunk on alcohol (see Appendix B). Specifically, the question stated, '*During the past 12 months, how many days have you been drunk or very high on alcohol?*' Responses ranged from 0-6 (0= *no alcohol use* and 6= *everyday or almost everyday use*). Those with responses ranging from 1-6 were recoded to 1 (1= y*es alcohol use problem*). Then, the responses from the seven types of substances were combined to form the AOD index for Wave III with values from 0-7. Higher values represented more severe AOD problems at Wave III (*M*= 1.24, *SD* = 1.23).

Obesity. Similar to obesity at Wave IV, obesity at Wave III was measured using BMI with values ranging from 0-4 (0= *normal weight*, 1= *overweight*, 2= *obese I*, 3= *obese II*, and 4 =*obese III;* see Appendix B). Higher values represented more severe obesity (*M*= .86, *SD*= 1.11). Underweight for Wave III obesity was not included in the analysis for this current study. [2]

Criminal Behaviors. Criminal behaviors at Wave III was determined by 14-related questions similar to criminal behaviors at Wave IV. All but one of the 14 questions were the same between Waves III and IV (see Appendix B). In Wave III, the participants were asked, '*In the past 12 months, how often did you use a weapon in a fight.*' In Wave IV, the question was '*In the past 12 months, how often did you get into a serious physical fight.*' The responses for both questions were the same and ranged from 0-3 (0= *never*, 1= *1 or 2 times*, 2= *3 or 4 times*, and 3= *5 or more times*). Only responses for Wave III were summed so that greater values represented more involvement in criminal activities at Wave III (*M*= 1.20, *SD*= 2.45).

[2] Fifty-seven or 3.3% of Wave III participants were underweight.

Demographics. Age, ethnicity/race, and biological sex were included as control variables in the data analyses. Participants' age at Wave I was calculated by subtracting the participant's birthdate from the interview date and transforming the dates into years. For data management purposes and to correct for missing date of births, Add Health developers used the 15th day along with the participants' stated month and year for participants' date of birth. Participants' biological sex were extracted at Wave I and categorized as males and females. The biological sex of participants was compared to later waves to address errors related to data collection and coding (Harris et al., 2009). Ethnicity/race was also extracted from Wave I and classified as Hispanics, Caucasians, African Americans, Asian/Pacific Islanders, Native Americans, and Others.

Data Analysis

The following section details the analytic plan for this study. Statistical Package Social Sciences (SPSS) 25 was used for data screening, bivariate analysis and descriptive statistics. However, the main analyses including EFA, CFA, and mediation and moderation analyses were conducted in Mplus 7.4. Mplus was used for the main analyses because this program permits the use of both sampling weights and cluster variables. Add Health developers incorporated sampling weights to account for missing data at a particular point in time or survey non-response (Chen & Chantala, 2014). In addition, the Add Health developers used school identification as the primary sampling unit resulting in students' clustering effect (Chen & Chantala, 2014). Ignoring clustering and weights will result in biased estimates of means, regression parameters, proportion, variance estimates and therefore, inaccurate hypothesis testing results (Chen & Chantala, 2014; Tourangeau & Shin, 1999). As such, clustering and weights were included in the main

analyses. SEM was selected for this study because it provides benefits beyond regression models and simultaneously analyzes the associations between multiple manifest and latent variables while accounting for measurement error or disturbances (De Carvalho & Chima, 2014). Mental health problems and SR deficiency were the only latent variables in this study. All other variables were manifest. In addition, interaction terms with regression was used to test for moderation effects. Statistical significance was set at $p \leq .05$ and assumed two-tailed significance in all calculations unless otherwise stated. All in text references for path coefficients refer to standardized path coefficients (β).

Descriptive Statistics, Bivariate, and Preliminary Analyses

Main statistical analyses were conducted to answer each research question of the study. In addition, basic descriptive statistics of the key study variables including mean scores, standard deviation, skewness, and kurtosis of the variables as well as bivariate correlations of the main study variables were also conducted and described. Preliminary analyses were also conducted to include assessment of outliers, the degree and pattern of missing data, univariate and multivariate non-normality, and sample size.

Research Question 1. The first research question focused on the structure of SR deficiency measure and its internal reliability and construct validity. Specifically, the hypothesis stated that the latent structure of SR will include emotional and cognitive factors or indicators. EFA and CFA were conducted to test this hypothesis as recommended for scale development and validation (Cabrera-Nguyen, 2010). An EFA was conducted with the first random half of the study's sample (n= 926) to identify the underlying factor structures or dimensions and refine the factor indicators. This was followed by a CFA with the second random half of the study's sample (n= 866) to verify

the psychometric properties of the scale. Reliability and validity tests were also included in the analysis to further confirm a consistent and accurate scale structure.

Exploratory Factor Analysis. Before running the EFA, the 17 indicators used for the SR scale were checked for outliers and normality by plotting their histograms and examining skewness and kurtosis. An absolute value of kurtosis index > 7 and skewness index >2 was determined as a departure from normality (Kim, 2013). The robust estimation method based on Hubert-White estimator (also known as the maximum likelihood estimator or MLR) was applied as implemented in Mplus (Muthén & Muthén, 2012). MLR was selected to account for non-normality and complex survey design, which includes clustering and weighting. In this estimator, chi-square is not affected by non-normal distribution and non-independence of observations (Muthén & Muthén, 2012). In addition, Pearson's *r* intercorrelations between indicators were also computed to identify high correlation (r >.90) which would suggest multicollinearity (Tabachnick & Fidell, 2013) and low correlation (r <.3; Field, 2012). As recommended by Field (2012), indicators with very low correlation coefficient (r < .3) with most or all of the other indicators and those that were not statistically significant with at least half of the were also excluded from the EFA.

Indicators are expected to correlate and therefore the geomin rotation, an oblique method, was used to extract the factors in the EFA. Both, the pattern matrix and factor correlation matrix were produced and examined for loadings and correlation between factors.

Multiple test results were examined to determine the number of factors to retain including the Kaiser's (1960) eigenvalue-greater-than-one rule (K1 or Kaiser criterion),

Cattell's (1966) scree plot, and model fit indices. As recommended by researchers, model fit was evaluated with a variety of global fit indices like chi-square statistic (χ^2) test of significance, absolute fit indexes like Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR), and relative fit index like Comparative Fit Index (CFI), and Tucker Lewis Index (TLI; Bollen & Long, 1993). CFI $\geq$ .90 and TLI $\geq$ .90 (Lance et al., 2006), SRMR $\leq$ .08 (Hu & Bentler, 1999; Kline, 2011), and RMSEA $\leq$ .08 (Maslowsky et al., 2015) were recognized in this study as the cutoff for acceptable model fit. In addition, rejection of a factor with fewer than three indicators were used to determine the number of factors to retain. The loadings of each indicator on the 2-3-4 factor solutions were examined. Indicators with less than .3 loadings and those with cross-loadings of less than or equal to .32 on multiple factors were removed from the factor (Costello & Osborne, 2005; Field, 2012; Yong, 2013). Cross-loadings indicate that the indicators could be influenced by more than one factors and thus obscure (Worthington & Whitter, 2006). EFA was re-computed after removing excluded indicators. Each of the remaining indicators and factors were examined for theoretical soundness. The parameter estimates were examined for Heywood cases. Heywood cases are those unacceptable estimates exhibiting out-of-range values such as correlations greater than one and negative variances or residual (Byrne, 2011).

Furthermore, the reliability of the factor solution was assessed using factor score determinacy. The factor score determinacy is the correlation of the factor score estimate with its corresponding factor (Beauducel & Hilger, 2017). It describes how well the factor is measured with coefficients ranging from zero to one (Muthén & Muthén, 2012).

A coefficient of .80 and above denotes acceptable reliability (Beauducel & Hilger, 2017; Brown, 2015).

Confirmatory Factor Analysis. CFA was used to test if the SR deficiency scale latent structure through EFA applies to a similar sample. As in EFA, MLR estimator was applied and the model fit indices were examined in the CFA. The results were also examined for Heywood cases. Skewness and kurtosis of each indicator were examined for non-normality. Missing values were handled using full-information maximum likelihood in Mplus (Muthén & Muthén, 2012). Modification indices were reviewed and any indices with values greater than 10 were evaluated. Modification indices should not be data-driven or used simply for the purpose of improving model fit but should be used to highlight areas that are theoretically related (Kline, 2011). Therefore, correlating errors terms of indicators with similar words or phrases was used as an acceptable strategy to justify model re-specification with a theoretical basis (Cabrera-Nguyen, 2010). Finally, the CFA was re-computed, and model fit indices re-examined for acceptable fit. The re-examined model was retained and reported as the final model.

Factor determinacy coefficients were also examined to determine scale quality and reliability. Convergent and discriminant validity were also computed for the SR factors or subscales. Convergent and discriminant validity are construct validity measures recommended for a scale with multiple indicators to assess its measurement validity (Neuman,1999). Convergent validity tests whether the measurement scale and subscales are associated or highly correlated with its assigned theoretical construct (Salas-Vallina & Alegre, 2018). Meanwhile, discriminant validity tests whether indicators of a construct are different from indicators of another construct (Neuman, 1999). The convergent and

discriminant validity were assessed for the SR subscales using average variance extracted (AVE) and composite reliability (CR). AVE and CR were manually calculated from the standardize loading of each indicator. These methods are considered superior to correlation methods as they account for measurement error (Li & Huang, 2017). Measures with both AVE greater than 0.50 and CR greater than 0.70 have acceptable convergent validity (Fornell & Larcker, 1981; Li & Huang, 2017). However, convergent validity can be concluded on CR only as using both AVE and CR is considered a more conservative method (Fornell & Larcker, 1981). Discriminant validity was assessed by comparing the correlation between the subscales found in the EFA with the AVE for each subscale. Discriminant validity is established if the AVE is greater than the correlation (Fornell & Larcker (1981).

Research Question 2. In the second research question adult SR deficiency was tested as a mediating factor between the association of childhood adversity and adult well-being outcomes. Specifically, the hypothesis for this research question stated that higher incidents of CM, VV, and EH will increase SR deficiency which will lead to higher rates of mental health problems, AOD problems, obesity, and criminal behaviors in adulthood.

The mediation analysis was conducted using SEM. SEM is designed specifically for complex analyses involving latent variables, weights, and clusters. It is also considered a preferred method compared to multiple regression for testing mediation due to its flexibility of including multiple outcomes, predictors, and mediators in one-model computation (Frazier et al., 2004). The mediation analysis with SEM involved a two-step process. First, the measurement model involving the latent and outcomes variables was

established. The measurement model also included the CFA model of the SR deficiency scale. Second, the structural model of the associations between the predictors, outcomes, and mediator (i.e. adult SR deficiency) was computed. Age, biological sex, ethnicity, and Wave III outcome variables were controlled for in the mediation analysis. The mediation model was examined for model fit, paths' statistical significance, and modification indices. Mediation was determined if the significant associations between childhood adversity and adult well-being outcomes were explained by their significant association with adult SR deficiency.

Research Question 3. In the third research question JA was tested as a moderator between childhood adversity and adult SR deficiency. Specifically, the hypothesis stated that the size of the positive association between childhood adversity and adult SR deficiency is greater among adults with JA history than their peers with no JA history.

The moderation analysis was computed using interaction terms in regression. The moderation analysis also included product terms. The product terms were computed with each predictor (i.e., CM, VV and EH) and the moderator variable (i.e., JA). Prior to creating the product terms, all the predictor variables were mean centered. The mean centered variables and product terms were created in Mplus. Age and biological sex were controlled for in the moderation analysis. The moderation model was examined for model fit, paths' statistical significance and modification indices. Moderation was determined if there was a statistically significant association between the product term and the SR deficiency latent variable.

IV. RESULTS

Characteristics of Study Sample

Table 1 includes the demographic characteristics of the study sample. Of the total 1,792 youth with delinquency histories included in the study, 49.1% were males and over half (62.6%) were Caucasians. Participants mean age ranged from 14 years old (*SD*= 1.24) at Wave I to 27 years old (*SD*= 1.27) at Wave IV.

Of the total sample, 89.2% reported delinquency history but no police arrest before age 18 years. On average, youth participants were involved in five delinquent incidents or behaviors (*SD* = 6.56). The most common delinquent behaviors reported were getting into a serious physical fight (48.6% at Wave I) and stealing from a store (29.5% at Wave II; see Table 1). The patterns of lawbreaking behaviors seen in this study reflect common youth offenses in the U.S. In 2017, property offenses including larceny-theft (32%) and person offenses including simple assaults (29%) were the most common offenses resulting in a JA in the U.S (Puzzanchera & Hockenberry, 2019). In addition, the average age of JA in the current study was 15.63 years old (*SD* = 1.59) which is similar to the JA age in the U.S. In 2017, 70% of 818,864 delinquency cases in the U.S. involved youth between 15-17 years old; (Sickmund et al., 2019).

About 81% of the study's participants experienced at least one childhood adversity incident (see Table 1). On average, participants were exposed to about five adverse incidents during childhood. CM was the most common of the three categories of childhood adversity evaluated in the study. Of the 1,792 participants, 70.3% experienced CM incident at least once (see Table 1).

Preliminary Analyses

Preliminary analyses included assessment of outliers, the degree and pattern of missing data, univariate and multivariate non-normality, and sample size. Additionally, weight and cluster variables were accounted for in all the main analyses.

Outliers

Outliers were assessed using leverage scores, a non-model-based analysis, and standardized *df* beta values, a model-based analysis. Anyone with a leverage score that was three times the average leverage score was considered an outlier (Field, 2012). As such, 43 participants were identified as outliers. The average leverage score for the study's participants on the predictor variables was .005. The full mediation model was conducted with and without the 43 outliers. After removing outliers, only one association became significant and two associations became nonsignificant. VV became positively and significantly associated with AOD use (path coefficient .070 [.128], $p \leq .05$) indicating that participants with greater VV experiences reported greater AOD problems. EH was no longer significantly associated with SR problems (path coefficient -.048 [-.051], $p = .056$) and SR problems were no longer significantly associated with AOD problems (path coefficient .056 [.348], $p = .088$). The moderation analysis was also conducted without outliers.

Furthermore, the standardized *df* betas for each individual in relation to each linear causal pathway implied by the model were computed using limited information regression analyses. Each outcome or endogenous variable was regressed on its corresponding predictor or exogenous variable. Standardized *df* beta coefficients were examined for each participant, predictor, and intercept. Anyone with a standardized *df*

beta coefficient above absolute one was considered an outlier (Field, 2013). No outliers were identified after examining standardized *df* betas in the study.

Missing Data

The study consisted of responses from 1,792 participants. EH had 174 or 9.7% missing responses and four indicators of the SR measure had missing responses ranging from 32-52 or from 1.8-2.9% (see Table 11). According to Bennett (2001), missing responses less than 10% is unlikely to potentially bias the study's results. However, the pattern of missing responses was assessed on the predictor variables using chi-square analyses for categorial variables and t-test analyses for continuous variables to ensure rigor (see Table 12). Dummy variables representing the presence and absence of missing data on EH and the four SR indicators were created and correlated with demographic variables such as age at Wave I, biological sex, and ethnicity. Results indicated that participants with missing responses on EH were older in age (M=14.85, SD=1.19) compared to those without missing responses (M= 14.45, SD=1.24), t (1790) = -4.073, $p \leq .001$. In addition, there was a significant association between biological sex and 'trying new things just for fun or thrills' (χ^2 [1] = 6.315, $p \leq .05$) such that more male participants had missing responses on 'trying new things just for fun or thrills' compared to females. As a result of the significant associations and to control for missingness, the effects of age and biological sex were controlled for in the mediation and moderation analyses. Ethnicity and Wave III outcomes were also controlled for in the mediation analysis to add rigor.

In addition, full-information maximum likelihood in Mplus (Muthén & Muthén, 2012) was applied to treat any potential bias related to missing responses. Furthermore, to

address survey non-response at one or more time points on this longitudinal panel study, the Add Health developers incorporated sampling weights with a non-response adjustment (Chen & Chantala, 2014).

Non-normality

Non-normality was examined using univariate analyses of skewness and kurtosis (see Table 10). Troublesome skewness was assessed as absolute values larger than 2 and troublesome kurtosis as absolute values larger than 7. Some troublesome skewness and kurtosis were identified. Four variables presented with troublesome skewness but only two presented with troublesome kurtosis: VV (skewness = 2.88, kurtosis = 10.17), EH (skewness = 2.64, kurtosis = 5.73), JA (skewness = 2.53, kurtosis = 4.42), and criminal behaviors (skewness = 4.70, kurtosis = 30.32). As such, robust estimation method based on MLR was applied as implemented in Mplus (Muthén & Muthén, 2012).

Sample Size

In this study, the EFA included a sample of 926 participants and the CFA included a sample of 866 participants. Both sample sizes were well above the minimum threshold of 500 participants for factor analysis recommended by MacCallum et al. (1999).

The final sample size of 1,749 in this study is greater than the 400 recommended by Savalei and Bentler (2005) for research using MLR. Therefore, the current sample size is adequate to test for mediation effects. G-power (Faul et al., 2007) was used to determine the adequate sample size needed for the current moderation (regression) analyses. In g-power, setting effect size (f^2) of .15, alpha of .05, standard power level of .80, and a total of 9 predictors (CM, EH, VV, JA, product terms for each of the three

types of childhood adversity, and age and biological sex) in the *F*-test, the sample size is calculated to be 114. Since the sample size of 1,749 is much larger than 114, the current sample size is considered sufficient to test the moderation effects.

Exploratory Factor Analysis

EFA was used to determine the underlying structure and number of latent constructs of the 17-SR indictors measured. Table 2 presents the 926 participants' responses to the 17-SR indicators for the EFA. Eight of the indicators showed the presence of SR and were reverse coded (see Appendix C). After doing so, all 17 items had the responses on a 5-point Likert scale with greater value indicating more SR problems or SR deficiency.

Several steps were completed in the EFA. First, the intercorrelations between the 17-SR indicators were examined. Four indicators were removed because they had very low correlations (r <.3) and/or were significantly correlated with less than half of the other indicators (see Table 3). The indicators removed were, 'like yourself,' 'doing things right,' 'not follow the crowd,' and 'satisfied with life as a whole.' The correlation matrix was also examined for multicollinearity, that is correlations exceeding .90, which would indicate that indicators were redundant and should not be included in the analysis (Tabachnick & Fidell, 2013). No multicollinearity was found.

Second, using MLR with geomin oblique rotation method, EFA was performed on the remaining 13-indicators. Initially, factors met the retention criterion of Kaiser's (1960) eigenvalue-greater-than-one rule (see Table 4) and the break point or point of inflexion in scree plot (Cattell, 1966) indicated that about two factors should be retained (see Figure 6). Therefore, the factor loadings and the goodness of fit indices of the two,

three, and four-factor solutions were analyzed (see Table 4 for indices). The point of inflexion is the data point where an eigenvalue (*Y*-axis) and its associated factor (*X*-axis) meet and the slope changes significantly (Field, 2012). The number of datapoints above the break point is the number of factors to retain (Costello & Osborne, 2005).

The criterion of rejection of a factor with fewer than three indicators was also used to determine which factors to retain (Floyd & Widman, 1995). Indicators with less than .3 factor loadings (Field, 2012; Yong, 2013) and those with cross-loadings of more than or equal to .32 on multiple factors were removed (Costello & Osborne, 2005). In the EFA with 13 indicators, the 2-factor solution had bad model fit, χ^2 (53) = 311.323, $p <$ .001, RMSEA = .073 with 90% CI (.065, .080), CFI = .883, TFI= .827, SRMR = .043 (see Table 4). In addition, the indicator 'stretch the truth' crossloaded on both the 3-factor and 4- factor solutions even though they had good model fit. Subsequently, this indicator was removed and the EFA with 12 indicators reanalyzed. The eigenvalues for the 12-indicators EFA indicated that two factors (eigenvalue = 4.345, 1.413) should be retained and therefore the 2-factor solution was examined. The 2-factor solution presented with good model fit , χ^2 (43) = 146.978, $p <$ .001, RMSEA = .051 with 90% CI (.042, .060), CFI = .947, TLI = .918, SRMR = .034 but three indicators crossloaded: 'get so excited that I lose control,' 'like no strict rules and regulations' and 'change my interest at lot.' The three indicators were removed and the EFA reanalyzed with the nine indicators. The EFA with the nine indicators was examined and accepted as the final 2-factor solution (see Table 5).

As presented in Table 4, the EFA with nine indicators and two factors has good model fit, χ^2 (19) = 51.067, $p <$ .001, RMSEA = .043 with 90% CI (.029, .057), CFI =

.972, TLI = .947, SRMR = .028, no factors that crossloaded, and theoretically sound or distinct interpretable factors. As presented in Table 5, the first factor included five indicators with factor loadings from .435 to .783 (eigenvalue = 3.189). Factor one was assigned the label sensation-seeking as most of the indicators loading the highest referred to seeking excitement and thrills. The second factor included four indicators with factor loadings from .302 to .753 (eigenvalue =1.404). Factor two was assigned the label lack of forward-thinking as the indicators loading the highest referred to thinking about consequences when making decisions. Communalities represent the proportion of common variance within the indicator shared with other indicators (Field, 2012). Communalities range from zero to one where those closer to zero indicates no shared variance or common underlying factor (Field, 2012). The 2-factor solution produced communalities ranging from .087 to .608 (see Table 5). The factor determinacies for Factor 1 and 2 were .896 and .843 respectively indicating adequate scale reliability. The two factors presented with low significant correlation of .304 indicating that each factor is measuring separate but related dimensions. Table 5 presents the mean, standard deviation, communalities, eigenvalues, and factor loadings of the final 2-factor solution.

Confirmatory Factor Analysis

Table 6 presents the correlations and the univariate descriptive statistics, namely the mean, standard deviation, kurtosis and skewness of the 9-SR indicators included in the CFA. As presented in Table 6, each indicator has a positive association with the other indicators ranging from .001 to .604. Also, there was no departure from normality based on the absolute value of kurtosis and skewness index. Thus, the responses are used in CFA without tranformation.

CFA was completed and examined to determine whether the two factor structures found in the EFA for the first sample holds in a second sample. The CFA was performed in Mplus with maximum likelihood estimation with robust standard errors in order to account for the complex survey design of 866 participants. The initial model did not provide satisfactory model fit: χ^2 (26) = 102.986, $p < .001$, RMSEA = .058 with 90% CI (.047, .071), CFI = .914, TLI= .880, SRMR = .052 (see Table 7). Therefore, the modification indices were examined to determine whether any parameters could be freed in order to improve model fit. Some modification indices were over the value of 10 and therefore, two sets of errors terms were correlated. The error value for 'try new things for thrills' was correlated with 'looking for something new and exciting or looking for excitement' as they were related to seeking something new. Likewise, the error value for 'live life without much future thoughts' was correlated with 'making a decision with gut feeling and don't think about the consequences' as they were related to thinking or thoughts. The revised CFA indicated adequate fit: χ^2 (24) = 72.874, $p < .001$, RMSEA = .048 with 90% CI (.036, .061), CFI = .945, TLI= .918, SRMR = .047 (see Table 7) and was accepted as the final model.

As presented in Table 8, Factor 1 or Sensation-Seeking subscale includes five factors with parameter estimates or factor loadings from .478 to .669. Factor 2 or Lack of Forward-Thinking subscale includes four variables with factor loadings from .168 to .986. In addition, the Lack of Forward-Thinking subscale is also positively and significantly correlated with Sensation-Seeking subscale (β=.565, $p \leq .001$) indicating that as sensation-seeking behaviors increase lack of forward-thinking behaviors also increase. The final CFA model with the unstandardized factor loadings in parentheses and the

standardized loading outside the parentheses is presented in Figure 7. The values in the circles represent standardized error variances. The error terms for ‘try new things for thrills’ was correlated with ‘looking for something new and exciting’ and ‘not much future thoughts’ was correlated with ‘making a decision with gut feeling and don’t think about the consequences’ (see Figure 7).

Construct Validity and Reliability

A significant part of scale development is assessing the psychometric properties of the scale. Psychometric properties include evaluating the scale using tests of reliability and validity (Boateng et al., 2018). Reliability is the internal consistency of a scale or subscale specifically the degree to which its indicators covary in relation to their summed score. Meanwhile, validity is the accuracy in which the scale or subscale measure the intended construct. Factor determinacy was used to measure reliability and construct validity was used to measure validity. The factor determinacies in the CFA model for Factor 1 (Sensation-Seeking) was .880 and Factor 2 (Lack of Forward-Thinking) was .986 indicating good to adequate scale reliability (coefficient > .80 is the recommended cutoff previously stated).

Both the convergent-construct validity and discriminant validity were measured for the two factors. Convergent-construct validity is indicated by AVE and CR. The AVE for each factor is the sum of squared standard loadings divided by the count of indicators (Salas-Vallina & Alegre, 2018). It measures the shared or common variance in a set of indicators of a factor. CR is the square of sum of standardized factor loadings divided by itself plus sum of indicator measurement errors (Salas-Vallina & Alegre, 2018). In other terms, it is the overall internal consistency of a set of indicators of the factor latent

construct. Calculated from the standardized loadings presented in the CFA, the acceptable cutoff for AVE is >.50 and CR is >.70 (Fornell & Larcker, 1981; Salas-Vallina & Alegre, 2018). As seen in Table 9, neither of the factors met the recommended value for AVE (Sensation-Seeking = .391; Lack of Forward-Thinking = .313) and only Sensation-Seeking met the recommended value for CR (Lack of Forward-Thinking = .546). Therefore, convergent-construct validity was achieved for only Sensation-Seeking subscale.

According to Fornell and Larcker (1981), discriminant-construct validity is achieved when the AVE of a subscale is larger than the correlations between that subscale and other subscales. From EFA results, the AVE of both Lack of Forward-Thinking subscale (AVE = .313) and Sensation-Seeking (AVE =.391) is greater than the bivariate correlation between Sensation-Seeking and Lack of Forward-Thinking (.304; see Table 5). Therefore, the comparison results indicate that both factors meet the criterion for discriminant validity.

Of the two subscales of SR identified through the EFA, only Sensation-Seeking with the five indicators met satisfactory psychometrics measures of reliability and validity. The five indicators used to measure SR deficiency in the mediation and moderation models were, ‘like to take risks,’ ‘try new things for fun or thrills,’ ‘looking for something new and exciting,’ ‘let people to believe untruth,’ and ‘do things based on feeling.’ As such, only these individual indicators will be included in the latent variable of adult SR deficiency in testing the mediation and moderation models. The decision to use only Sensation-Seeking subscale indicators is according to Fornell and Larcker’s (1981) recommendation that hypotheses testing should not proceed with scales or

subscales that have inadequate psychrometric properties. In short, unreliable and inaccurate measurements will produce inaccurate and untrustworthy results (Fornell & Larcker, 1981).

Bivariate Analysis Statistics

Bivariate statistics among the main study variables were computed to explore the associations between childhood adversity, SR problems and adult well-being outcomes. Bivariate statistics between outcome variables were also described. Only significant associations were highlighted (see Table 10 for significant and nonsignificant results).

For the mediation analysis, childhood adversity (i.e., CM, VV and EH) were positively and significantly associated with the adult well-being outcomes of depression, stress, and criminal behaviors (see Table 10). In other words, participants with greater childhood adversity exposure experienced greater problems with depression, stress, and criminal behaviors. The strength of these associations varied from small to medium with the smallest association between EH and criminal behaviors (r= .058, $p \leq$.05) and the largest association between CM and depression (r= .197, $p \leq$.01). Only CM (r= .053, $p \leq$.05) and VV (r= .084, $p \leq$.01) were positively and significantly associated with AOD use, and only VV was positively and significantly associated with obesity (r= .050, $p \leq$.05).

Childhood adversity was also associated with SR problems in adulthood. The SR deficiency latent measure includes five indicators: ‘like to take risks,’ ‘try new things for thrills,’ ‘look for excitement,’ ‘get people to believe untruth,’ and ‘do things based on feeling.’ The results indicated that CM and VV were positively and significantly associated with ‘look for excitement,’ ‘get people to believe untruth,’ and ‘do things

based on feeling' even though these associations were small ($r \leq .095$, $p \leq .05$). This could be interpreted as participants who reported greater CM and VV experiences also reported greater SR problems in adulthood specifically in seeking for excitement, engaging in manipulative behaviors and acting on impulse. CM was also significantly and positively associated with 'try new things just for thrills' ($r= .089$, $p \leq .01$) and VV was significantly and positively associated with 'like to take risks ($r= .092$, $p \leq .01$). Only EH had a negative significant association with adult SR problems, specifically the indicator 'get people to believe untruth' ($r= -.057$, $p \leq .05$). Participants who reported greater EH engaged less in manipulative behaviors (i.e. getting people to believe untruth).

As shown in Table 10, there were also significant correlations among adult well-being outcomes. Criminal behaviors were positively associated with depression ($r = .118$, $p \leq .01$), stress ($r = .115$, $p \leq .01$), and AOD use ($r= .325$, $p \leq .01$). This means adult participants who reported criminal behaviors also reported problems with depression, stress, and AOD use. In addition, depression was positively associated with stress ($r= .665$, $p \leq .01$). Obesity and AOD use were the only two variables that significantly and negatively correlated with each other ($r=-.088$, $p \leq .01$). This is to say that participants who reported increased AOD problems reported less problems with obesity. In terms of SR problems, criminal behaviors and AOD problems had small but positive and significant correlations with all five SR deficiency indicators ($r= .100$ to $.325$, $p \leq .01$). However, only depression ($r = -.069$, $p \leq .01$). and stress ($r= -.071$, $p \leq .01$) had a negative but significant correlation with 'like to take risk' indicating that participants with depression and stress tend to take less risk. Obesity was significantly correlated with only

one SR deficiency indicator, 'try new things just for thrills' (r= .051, $p \leq$.05). There were no other significant correlations.

For the moderation analysis, CM, VV, and EH were positively and significantly associated with JA and with the five SR deficiency indicators (r ranged from .065 to .197, $p \leq$.01; see Table 10). In essence, participants who reported exposure to CM, VV, and EH were likely to have a JA and greater SR problems in adulthood.

Overall, all the variables in this study were significantly associated with at least half or more of the other variables (except obesity). Obesity was associated with VV, AOD use, and 'try new things for fun' (see Table 10).

Mediation Analysis

The results of the final mediation model are presented in Figure 8. This figure includes both standardized (outside the parentheses) and unstandardized (inside parentheses) estimates. The standardized error variances are presented in circles. Significant pathways are presented with solid lines and nonsignificant pathways with dashed lines. In the SEM, exogenous variables included childhood adversity predictors, demographic variables measured at Wave 1, and outcome variables measured at Wave III (see Table 1). Age, biological sex, ethnicity, and Wave III outcome variables were regressed on both SR and well-being outcomes to control for their effects in the SEM mediation model. The mediator was the latent variable of SR deficiency measured by the five indicators confirmed in the CFA with good validity and reliability. Endogenous variables were adult well-being outcomes: mental health problems, AOD use, criminal behaviors, and obesity measured at Wave IV. Mental health problems (latent variable) were indicated by depression and stress. Overall, the proposed mediation model indicated

good fit between the hypothesized model and the observed data, χ^2 (118) =225.238, $p \leq$ .001, RMSEA = .023 with 90% CI (.018, .027), CFI = .978, TLI= 957, SRMR = .015 (see Table 13).

In the measurement model, the five observed measures such as 'like to take risks' (β =.488, $p \leq .001$), 'try new things for thrills' (β =.718, $p \leq .001$), 'look for excitement' (β =.768, $p \leq .001$), 'get people to believe untruth' (β =.595, $p \leq .001$), and 'do things based on feeling' (β =.624, $p \leq .001$) were significantly and positively associated with their corresponding SR deficiency latent variable. Essentially, participants with more frequent behaviors in taking risks, trying new things just for fun, looking for exciting and new things, manipulating others, and acting on impulses indicated greater SR problems. In addition, the observed measures of depression (β =.873; $p \leq .001$) and stress (β =.772; $p \leq .001$) were significantly and positively associated with the corresponding latent variable of self- reported mental health problems. Accordingly, participants who reported greater symptoms of depression and stress indicated greater mental health problems.

In examining the structural model, only CM was significantly and positively associated with adult SR deficiency (β = .089, $p \leq .001$). CM was also significantly and positively associated with two adult outcomes, namely mental health problems (β = .144, $p \leq .001$) and criminal behaviors (β =.096, $p \leq .001$). That is, greater exposure to CM was associated with problems in SR, mental health and criminal activities as an adult. In addition, VV experienced during childhood (i.e., prior to age 18 years) was significantly and positively associated with adults' AOD use (β = .070, $p \leq .05$) and criminal behaviors (β = .087, $p \leq .01$). Greater VV exposure was associated with increased risk of using alcohol and drugs and engaging in criminal behaviors as an adult. Finally, EH

experienced during childhood (i.e., prior to age 18 years) was significantly and positively associated with mental health problems in adulthood (β=.140, $p \leq .001$), but negatively associated with obesity (β= -.041, $p \leq .05$). Simply put, EH experiences were associated with greater mental health problems but less problems with obesity in adulthood. The findings were evident regardless of participants' age, biological sex, ethnicity and prior poor outcomes (i.e., mental health problems, obesity, AOD problems, and criminal behaviors). All other pathways in the model were not statistically significant (see Figure 8).

Table 13 presents the structural model which consists of the standardized and unstandardized coefficients for the total, direct, and indirect effects of the association between childhood adversity, SR deficiency, and adult well-being outcomes. Each childhood adversity predictor had total and direct effects on at least two adult outcomes. Exposure to CM had significant direct effects on mental health problems (direct=.144, $p \leq .001$) and criminal behaviors (direct =.096, $p \leq .001$) during adulthood. Similarly, VV experienced prior to adulthood had a significant effect on AOD problems (direct =.070, $p \leq .05$) and criminal behaviors (direct=.087, $p \leq .01$) during adulthood. EH also had direct effects on mental health problems (direct= .002, $p \leq .001$) and obesity (direct= -.041, $p \leq .05$). No other direct effects and no mediating effects were found in the model.

Moderation Analysis

The moderation analysis included childhood adversity predicators (i.e., CM, VV, and EH), JA, product terms (i.e., CM x JA, VV x JA, and EH x JA), adult SR deficiency latent variable, and control variables. Age and biological sex were regressed on SR deficiency to control for their effects in the moderation analysis. The results of the

moderation analysis are depicted in Figure 9 and Table 14. Overall, the proposed moderation model indicated good fit between the hypothesized model and the observed data, χ^2 (55) =153.797, $p \leq .001$, RMSEA=.032 with 90% CI (.026, .038), CFI=.947, TLI= .947, and SRMR=.032.

In Figure 9, solid lines represent significant pathways while dashed lines represent nonsignificant pathways. The moderation parameter estimates indicated that CM (β =.115, $p \leq .001$), VV (β =.071, $p \leq .05$), and JA (β =.100, $p \leq .01$) significantly and positively predicted SR problems in adulthood. This means the presence of a JA as well as greater incidents of CM and VV experiences were associated with greater adult SR problems. In examining the product terms, JA did not have a moderating effect even after controlling for demographic variables. One moderation model was computed which included all the predictors, product terms, SR deficiency (latent variable), and control variables.

V. DISCUSSION AND LIMITATIONS

The main goal of the current study was to increase understanding and augment existing knowledge on the association between childhood adversity, JA, adult SR, and adult well-being outcomes. The study accomplished three specific aims. The first aim was to develop a valid and reliable measurement of adult SR using a sample of individuals with a history of self-reported delinquency from the Add Health study, which is a dataset with a nationally representative sample of youth in the U.S. The second aim was to test adult SR deficiency, determined by this new measure, as a possible mediating factor for the effects of childhood adversity (i.e., CM, VV, and EH) on adult well-being outcomes (i.e., mental health problems, AOD use, obesity, and criminal behaviors). The third aim was to evaluate the moderation effects of JA on the association between childhood adversity (i.e., CM, VV, and EH) and adult SR deficiency. The following discussion first highlights the prevalence of childhood adversity among the study's sample and then addresses these three specific research aims in turn.

Childhood Adversity Among Individuals with Juvenile Delinquency Histories

Results of the current study confirmed the high prevalence of childhood adversity among individuals with delinquency histories. Accordingly, 80.9% of participants were exposed to at least one childhood adversity incident. In addition, on average, each participant reported exposure to about five adversity incidents before 18 years old. Most (89.2%) of the current participants were attending school and had never been arrested and thus were never involved in the justice system. It is suspected that these rates could be higher for individuals with justice-involvement as they are less likely to be engaged in school (Monahan et al., 2014) and school attendance or engagement is seen as a

protective factor against childhood adversity (Bellis et al., 2018; Turanovic & Pratt, 2015). Regardless, individuals with delinquency backgrounds is a highly traumatized group.

Measuring Self-Regulation in Adulthood

For the first aim, the study focused on creating a valid and reliable measure of adult SR. Most researchers conceptualize SR as a skill involving cognitive and emotional indicators or processes to achieve a goal-directed behavior (McClelland et al., 2018; McLaughlin, 2016; Murray et al., 2019). The current study confirmed that adult SR deficiency is one latent construct comprising of indicators with underlying emotional and cognitive processes. The adult SR deficiency measure included indicators of risk-taking (i.e., '*like to take risks'*), sensation-seeking (i.e., '*try new things for fun or thrills*,' and '*looking for something new and exciting*'), manipulative (i.e., '*let people to believe untruth*'), and impulsive (i.e., '*do things based on feeling*') behaviors. Risk-taking, sensation-seeking, and impulsivity are often seen as overlapping behaviors triggered by an automatic emotional response (such as fear) to an environmental or social situation (Nigg, 2017; Steinberg, 2008). These behaviors represent a breakdown in SR or the brain's cognitive control capacity (Nigg, 2017; Steinberg, 2008). Steinberg (2008) also described risk-taking, sensation-seeking, and impulsivity as linked to various aspects of brain functioning (e.g., limbic system and dopamine neurotransmitter) involved SR. Furthermore, risk-taking, sensation-seeking, and impulsivity have been used in past studies to measure self-control or SR (Grasmick et al., 1993; Peach & Gaultney, 2013; Patton et al., 1995; Tangney et al., 2004; Wolfe & Hoffmann, 2016).

Manipulation is not commonly included in SR measures, yet it is described as a behavioral response to cope with feelings of fear, anxiety, and/or lack of control (Bowers, 2003), which could be seen as an aspect of SR deficiency. In addition, manipulation and deception are commonly identified as key qualities used by those with offending and criminal backgrounds (DeLisi et al., 2014; Tulloch, 2010) and thus relevant to this study considering the deviant behaviors noted in the sample.

Overall, the adult SR deficiency scale for this study included five behavior indicators (i.e., risk-taking, sensation-seeking [has two indicators], manipulative, and impulsive behaviors) with underlying emotional and cognitive processes. The adult SR deficiency scale demonstrated satisfactory validity (convergent-construct validity [CR] =.760, discriminant-construct validity [AVE of a subscale > correlations between that subscale and other subscales] = .391 > .304) and reliability (factor determinacy = .880).

Mediating Effects of Adult Self-Regulation

For the second aim, the study examined the direct effects of childhood adversity on adult outcomes as well as the mediating effects of adult SR deficiency on the association between childhood adversity and adult well-being. Results from this study confirmed several significant direct effects of childhood adversity on adult outcomes. EH (β =.140, $p \leq .001$) and CM (β = .144, $p \leq .001$) were strong predictors of mental health problems (i.e., depression and stress) in adulthood. However, VV was not associated with mental health problems in adults with delinquency histories. Basically, EH and CM, which were assessed as adversity experienced within the home, were more detrimental to long-term mental health problems compared to VV, which was measured as an adversity experienced outside the home. This finding is not unusual considering that symptoms of

depression, such as guilt, isolation, and hopelessness are typical in parent-child relationships where CM (Gorey et al., 2001) and EH (Nikulina et al., 2011; Tracy et al., 2008) exist. VV ($\beta = .070$, $p \leq .05$) was the only childhood adversity predictor associated with AOD use in adults. It could be that youth with offending backgrounds are exposed to AOD use in their neighborhoods which are commonly saturated with disorder (i.e., illegal drug activities, and/or liquor stores). Accumulating evidence suggests that neighborhood disorder is a risk factor for VV (Aisenberg & Herrenkohl, 2008; Cooley-Strickland et al., 2009; Hartinger-Saunders et al., 2012; Santiago & Galster, 2014) and adult AOD use problems (Gruenewald, 2011). Therefore, the link between VV and adult AOD use is supported by previous studies. Furthermore, the association of VV and AOD use parallels a meta-analysis conducted by Fowler et al. (2009), which found that exposure to violence within the community has a greater impact on externalizing behaviors than internalizing problems.

Findings from the current study also confirmed that CM ($\beta = .096$, $p \leq .001$) and VV ($\beta = .087$, $p \leq .01$) are significant predictors of adult criminal behaviors, indicating that exposure to violence and threat (i.e., in the home or in the community) increases the risk of committing crimes in adulthood. This link between violence and crime supports and expands the pioneering research on the cycle of violence hypothesis posited by Widom from the 1980s. Widom and Maxfield (2001) discovered that children with substantiated histories of CM were more likely to engage in future delinquent behaviors, and violent crimes, and to have an adult arrest record compared to those without a substantiated maltreatment history. While Widom and Maxwell's (2001) study focused on CM, the current study also examined violence in the community. Results from the

current study showed that among participants with delinquency histories, adverse and violent experiences in the home and community influence adult criminal behaviors (e.g., violent, nonviolent, and property crimes). In contrast, EH had no effect on adult criminal behaviors within the current sample, which is consistent with research suggesting that growing up with EH or poverty is not directly related to criminal offenses later in life after adjusting for child and family characteristics such as ethnicity and age (Duncan et al., 2012; Gibb et al., 2012).

Of the three childhood adversities investigated in this study, only EH ($\beta = -.041$, $p \leq .05$) was directly associated with increased risk of obesity in adults with delinquency histories. Results indicated that EH significantly predicted a decrease in adult obesity. This finding conflicts with research which reported that EH in childhood is a risk factor for obesity in adulthood (Isasi et al., 2016). One explanation could be related to how EH was measured in this study, which only assessed for the receipt of food stamps and cash assistance. Past research showed that receiving food stamps did not contribute to weight gain for some participants (Larson & Story, 2011).

In the study, CM ($\beta = .089$, $p \leq .001$) was the only childhood adversity associated with SR deficiency in adulthood. As previously mentioned, SR is developed through co-regulation and learning regulatory skills through social interactions with parents, caregivers, and significant others (Murray et al., 2015). However, CM can indicate that caregivers themselves have poor parenting and SR skills (Crandall et al., 2015). Children who are raised by caregivers with poor parenting and SR skills have limited opportunities to learn SR skills from their caregivers (Crandall et al., 2015) and may also display SR deficiency.

For the mediation model, it was hypothesized that adult SR deficiency will mediate the pathway between childhood adversity (i.e., CM, VV, and EH) and adult well-being outcomes (i.e., mental health problems, AOD use, obesity, and criminal behaviors). This hypothesis was not confirmed even after controlling for the effects of age, ethnicity, biological sex, and prior well-being outcomes (i.e. mental health problems, AOD use, obesity, and criminal behaviors measured at Wave III). One possible explanation for this finding is the continuing development of SR skills throughout early adulthood. SR deficiency was collected at Wave III when participants' average age was 20 years old and the adult well-being outcomes were collected during Wave IV when participants' average age was 27 years old. Developmentally, individuals between 18 to 28 (even up to age 30) are considered emerging adults or young adults dealing with complex emotional, and neurodevelopmental changes (Wood et al., 2018; Zastrow & Krist-Ashman, 2016) linked to SR. As previously stated, SR development includes executive functioning processes which occur in the prefrontal cortex that is still developing well into young adulthood (Murray et al., 2019). These changes are sometimes prolonged and more difficult for those who have experienced childhood adversity (Wood et al., 2018). Basically, most of the study's participants were still experiencing developmental growth and changes in SR processes which suggests that an accurate assessment of SR deficiency effects on adult well-being may not have been fully present. Thus, evidence of significant mediation may not be apparent until participants are older.

Another explanation could be environmental; the U.S. has seen an increase in trauma-informed care policies and practices since the late 1990s, which is around the time when the Add Health data was collected (i.e., between 1994 to 2009). Trauma-

informed care is defined as an approach which involves the integration of trauma awareness, understanding, and principles during service delivery (Branson et al., 2017). In 1999 national bodies, such as the National Association of State Mental Health Program Directors, started to recognize the need to provide trauma-informed care services and interventions to those exposed to violence, adversity, and other traumatic events. In 2000, the federal government passed the Children's Health Act and created the National Child Traumatic Stress Network to improve the standard of care for children and families exposed to traumatic events. It is plausible that the increase in trauma awareness and adopting more trauma-informed care policies and practices nationwide may have buffered long-term effects of childhood adversity on adult well-being during the time of the Add Health data collection.

Moderating Effects of Juvenile Arrest

For the third aim, the study examined the direct effects of childhood adversity (i.e., CM, VV, and EH) on adult SR deficiency as well as the moderating effects of JA on the association between childhood adversity and adult SR deficiency. Results from this study confirmed several notable direct effects of childhood adversity on adult SR deficiency. CM (β =.115, $p \leq$. 001), VV (β =.071, $p \leq .05$), and JA (β =.100, $p \leq .01$) were significant predictors of adult SR deficiency. This finding is consistent with the literature supporting CM (Bunch et al., 2018; Meldrum et al., 2019) and VV (Monahan et al., 2015) as predictors of poor SR. Regarding JA, studies which examine the impact of JA on adult SR deficiency are limited and thus little is known about this association. However, the link between JA and adult SR deficiency is not surprising considering the adversity experienced by youth who have experienced arrest. These youths are sometimes

exposed to abuse, victimization, and harassment by staff and peers while incarcerated (Rhoden et al., 2019). In addition, the cumulative disadvantage of stigma and societal sanctions due to their arrest and delinquency labeling could result in enduring stressful experiences (Kirk & Sampson, 2013). These adverse events or incidents of victimization may further deteriorate their self-regulatory capacity and well-being (Aizer & Doyle, 2015; Burrell, 2013; Ford & Blaustein, 2013; Jaggers et al., 2016). Regarding EH, results from the study showed that EH in childhood had no direct effect on adult SR deficiency. This finding is different from previous studies which indicate a significant association between EH and problems in adult SR processes (Kim et al., 2013). Again, the measure of EH in this study, which only assessed for receipt of food stamps and cash assistance, may have been limited in accounting for the impact of childhood EH on adult SR deficiency.

For the moderation model, it was hypothesized that JA will moderate the association between childhood adversity (i.e., CM, VV, and EH) and adult SR deficiency. This hypothesis was not confirmed even after controlling for the effects of age and biological sex. One possible explanation could be that the JA measure does not fully capture the impact of the arrest experience. For this study, JA was evaluated as whether or not the youth experienced a police arrest incident. Simply assessing the occurrence of an arrest incident may not fully capture the arrest experience and thus may not give a complete depiction of the impact of getting arrested. Perhaps a JA measure that includes experiences of assault and victimization while incarcerated, experiences with court proceedings, and/or experiences of stigma and victimization due to delinquency or an

arrest label may capture a more accurate representation of the effects of JA and possibly have a moderating effect.

Another explanation for the lack of moderating effect could be the increase in community-based rehabilitation programs for youth who come in contact with the justice system in the U.S. In 1992, the federal government sponsored and enacted the largest program targeting children's mental health called the Community Mental Health Services for Children and Their Families Program (U.S. Department of Health & Human Services, 1999). This fueled many community-based programs to focus on youths with serious mental, emotional, and behavioral health problems including those who come in contact with the justice system and those with childhood adversity histories. Community-based programs and services have been shown to produce more positive effects on youth outcomes compared to incarceration (Farrell et al., 2018). In the current study, youth participants may have been given access to community-based services as an alternative to incarceration, which may lessen the interaction effects of JA and childhood adversity on adult outcomes.

In sum, the current study showed no mediation effects for adult SR deficiency on the association between childhood adversity and adult well-being outcomes. In addition, the study showed no moderating effects of JA on the association between childhood adversity and adult SR deficiency. However, each childhood adversity (i.e., CM, VV, and EH) had direct effects on several adult well-being outcomes as well as adult SR deficiency. Likewise, JA has direct effects on adult SR deficiency.

Limitations

Despite the methodological rigor of the current research study, three main limitations should be noted. First, the Add Health developers largely collected the data using adolescent self-report, except for EH, which was reported by caregivers. In addition, some measures (e.g., JA and CM) were collected retrospectively, which introduces possible under-reporting and recall bias. According to Althubaiti (2016), social desirability bias and recall bias are common risks that undermine the accuracy and reliability of self-reported data. Social desirability refers to responding to a question in such a way that is deemed acceptable to society even if that response is false. Recall bias refers to the risk of inaccurate responses due to the participant's ability to remember details of past events. Despite the risks, several research studies have provided evidence supporting the reliability of adults' retrospective reports of CM incidences (Fisher et al., 2011; Widom & Shepard, 1996). In general, many childhood adversity cases are not officially reported to the authorities, and therefore self-report data is important for researchers because of the limits in official reports. Moreover, the Add Health developers implemented computer-assisted devices to improve accuracy and to reduce the risk of social desirability for sensitive questions (Harris, 2013). Nonetheless, combining self-reported data with official records and/or other alternative means (e.g., family member reports) would likely improve the accuracy of data and should be considered for future studies.

Second, only two of the main constructs (i.e., CES-D, Radloff, 1977; PSS, Cohen et al., 1983) used in this study are standardized scales that have been tested and demonstrated to be valid and reliable measurements. The other constructs were measured

by using a single item (e.g., obesity) or by combining multiple items (e.g., CM, VV, EH, AOD use, and criminal behaviors). These single item or multiple-item constructs were not tested for psychometric features (e.g., validity tests), but they are similar to measures used in the literature and measures used in previous studies (Chen et al., 2015; Chiu et al., 2011; National Institutes of Health, 1998; Sickmund & Puzzanchera, 2014). In addition, reliability analyses were conducted for these constructs. Also, Add Health developers extensively pilot tested each survey item to reduce and remove discrepancies (Udry, 2001).

In addition, one of this study's hypotheses was to create a standardized measure for adult SR deficiency, which is another main construct in this study. Although the findings from the study confirmed a reliable and valid measure of adult SR deficiency, there is a concern that the adult SR deficiency construct assesses mainly sensation-seeking behaviors. However, in a meta-analysis on self-control measures, Duckworth and Kern (2011) reported that self-control (also known as SR) is a coherent but multidimensional construct. The meta-analysis provided supporting evidence that self-control or SR commonly includes sensation-seeking impulses generated by the emotional aspects of the brain and impulse-controlling functions with underlying cognitive processes (Duckworth & Kern, 2011). For the current study, the adult SR deficiency measure was self-reported and included multiple indicators (i.e., risk-taking, impulsivity, sensation-seeking, and manipulativeness) with underlying emotional and cognitive processes. In addition, most of these indicators (e.g., risk-taking, impulsivity, sensation-seeking) have been used in past studies to measure self-control or SR (Grasmick et al.,

1993; Peach & Gaultney, 2013; Patton et al., 1995; Tangney et al., 2004; Wolfe & Hoffmann, 2016).

Finally, the current sample is a subset of a larger study involving a nationally representative sample of adolescents. The adolescents were mainly sampled from schools and lived in the community (i.e., not institutionalized or in residential facilities) at the time of Add Health data collection. The current study includes only those youth with self-reported delinquency histories. Youth with delinquency histories are less likely to be engaged in schools (Bender, 2012; Henry et al., 2012; Hoffmann, 2018) and may reside in institutional settings or justice residential facilities (e.g., detention centers, prisons, and residential treatment programs) as opposed to the general community, therefore limiting the generalizability of the current findings to all individuals with delinquency histories.

VI. IMPLICATIONS AND CONCLUSION

The results of the current study suggest several implications for policy, practice, and research to address the negative effects of childhood adversity and JA. The implications include service programs to prevent childhood adversity and JA, trauma-informed care policies and services to mitigate the detrimental effects of childhood adversity, research to identify pathways connecting childhood adversity to adult outcomes, and assessments to consider including manipulative behaviors when measuring adult SR deficiency. The following section addresses each of the aforementioned implications and then highlights theoretical implications for the LCP and transdiagnostic model based on the results of this research study.

Preventing Childhood Adversity and Juvenile Arrest

This study showed the high prevalence of childhood adversity among youth with delinquency histories. According to the Center for Disease Control (2019b) the prevention of childhood adversity is a top public health priority that should be addressed by targeting systems or sectors (e.g., school/education, healthcare, public assistance/welfare, social services, etc.) and by working directly with individuals and their families. Targeting systems serving high-risk youth and families could potentially have widespread effects on the prevention of childhood adversity. One basic system-level policy that could have significant impact on preventing childhood adversity is screening tools. Practitioners and policymakers should incorporate screening tools into sectors that serve children and families as a main approach to prevent childhood adversity. Practitioners can screen for childhood adversities and their associated risk factors to identify high-risk youth and families and provide them with appropriate community

resources. For example, primary care physicians may use the Safe Environment for Every Kid Model to screen for risk factors (e.g., food insecurity, harsh punishment, and parental depression and substance use) and exposure to childhood adversity (Centers for Disease Control and Prevention, 2019b). The Safe Environment for Every Kid Model is an evidence-based program has shown several significant positive effects including reduced child protective services reports and fewer incidents of harsh punishment by parents (Centers for Disease Control and Prevention, 2019b).

In addition to screening tools, prevention efforts should focus on providing direct services to high-risk youth and their families. This research study focused on three types of childhood adversities: CM, VV, and EH. For CM prevention, practitioners should work with high-risk families to improve parenting skills and reinforce positive and nurturing parent-child relationships by using home visitation and other parent training programs. Evidence-based home visitation programs such as Healthy Families America and Nurse Family Partnership for first-time mothers (Jones et al., 2020), as well as Family Check Up for parents enrolled in the Women, Infants, and Children program (Shaw et al., 2015), have shown to improve positive parenting skills and parent-child interactions and thus reduce the likelihood of CM.

To prevent VV, practitioners should promote creating safer communities for youth while connecting youths to nurturing adults and prosocial activities. The Cure Violence Model (also known as Ceasefire) is a community-based violence prevention program where trained outreach workers identify potential conflicts (e.g. gang disputes and/or retaliation) and those at highest risk of perpetrating violence, then provide interventions and mobilize the community to oppose violence and establish positive

community norms such as neighborhood associations (Skogan et al., 2009). The Cure Violence Model has been widely studied and proven to significantly reduce gun shootings, violent crimes, and retaliation homicides (Skogan et al., 2009). In addition, mentorship programs (e.g., Big Brothers Big Sisters of America Program) and after-school programs (e.g., After School Matters Program) have been shown to increase school engagement and involvement as well as reduce victimization and involvement in crime (David-Ferdon et al., 2016). Specifically, a randomized controlled trial for the After School Matters Program implemented in 10 high schools in Chicago showed improved SR skills among low-income students (David-Ferdon et al., 2016).

To prevent incidents of EH, practitioners and policymakers should focus on strengthening the economic supports for families with children. Free or subsidized school meal programs (Bartfeld & Ahn, 2011) and public assistance programs (Centers for Disease Control and Prevention, 2019b) could potentially prevent and reduce the negative effects of EH by improving the parents' ability to provide for their children's basic needs. For example, Gundersen and Ziliak (2015) found that the Supplemental Nutrition Assistance Program, a food assistance program, could reduce the economic burden on families.

Finally, working with high-risk families and youth could also prevent and ultimately reduce the negative effects of JA shown in this study. Practitioners should focus on diverting youth from the justice system to community-based service programs. Research has shown that family-based community treatment such as Multisystemic Therapy significantly increase positive family functioning and decrease delinquent

behaviors (Henggeler & Schoenwald, 2011), which could ultimately prevent the long-term effects of JA.

Reducing the Negative Effects of Childhood Adversity

This study showed that childhood adversity was associated with several poor adult outcomes and therefore highlights the need for trauma-informed intervention strategies. Trauma-informed intervention is treatment which incorporates the understanding and impact of trauma on the survivor's life long-term (Centers for Disease Control and Prevention, 2019b). Therefore, in addition to preventing childhood adversity, practitioners and policymakers should also plan effective trauma-informed policies and practices to mitigate the negative effects of childhood adversity for those already exposed to adversity. Given that the participants for this research study were attending schools, it is important to target schools for timely trauma-informed intervention efforts. Childhood adversity or trauma awareness training can help school personnel and administrators increase awareness on the symptoms and effects of childhood adversity so as to refer youths to effective treatment programs. Some U.S. states have already incorporated trauma-informed policies and practices in their school system. For example, Massachusetts has implemented trauma-sensitive policies and practices in schools. These policies and practices include training school staff on the impact of trauma and teaching them skills to support dysregulated students; these practices also include connecting students and their families to trained mental health professionals to address the effects of the traumatic exposure (McInerney & McKlindon, 2014). In addition, the state of Washington's Compassionate Schools Initiative has also provided school officials with a handbook on positive interactions with students who have experienced childhood

adversity (McInerney & McKlindon, 2014). One school in the state of Washington reported a significant reduction in expulsions and suspensions since implementation of their trauma-informed, school-based approach (McInerney & McKlindon, 2014). Trauma-informed policies and practices in schools can reduce behavioral and emotional problems associated with exposure to childhood adversity.

In addition, evidence-based trauma-specific treatment programs can be used to reduce the effects of childhood adversity. For example, Trauma-Focused Cognitive Behavior Therapy is an evidence-based trauma treatment that has proven to reduce traumatic- stress reactions (e.g. behavioral and emotional regulation problems) and depressive symptoms among youths with delinquency histories and childhood adversity (Cohen et al., 2016). In addition, Smith et al. (2012) found that Multidimensional Treatment Foster Care was effective in reducing trauma-related mental health symptoms (e.g., depression, anxiety, and traumatic- stress reactions) and delinquency among youth with co-occurring trauma and delinquency.

In sum, there is a high prevalence of childhood adversity among youth with delinquency histories. In addition, childhood adversity has long-term negative effects on adult health and criminal behaviors. To address JA and the widespread impact of childhood adversity, practitioners and policymakers should provide and promote prevention and trauma-informed intervention strategies through system-level policies and practices as well as direct services to high-risk youth and their families.

Identifying the Pathways Linking Childhood Adversity to Adult Outcomes

Although adult SR deficiency had no mediating effects, childhood adversity had significant direct effects on adult well-being outcomes in this research study. Some

childhood adversities significantly predicted the same adult outcomes (e.g., CM and VV separately predicted adult criminal behaviors) while uniquely predicting different adult outcomes (e.g., CM predicted mental health problems but had no effect on AOD use, and VV predicted AOD use but had no effect on mental health problems). This finding suggests the need for future research to explore and identify other potential shared and unique pathways between childhood adversity and adult well-being outcomes. It is well-supported that childhood adversity is detrimental to adult health outcomes and increases the risk of criminal behaviors. However, research is limited on the factors linking childhood adversity to poor outcomes. Understanding and identifying these shared and unique pathways will help practitioners provide more effective treatment in mitigating the negative effects of childhood adversity. For instance, researchers could examine whether feelings of guilt, isolation, and hopelessness in parent-child relationships that are found to be associated with CM (Gorey et al., 2001) and EH (Nikulina et al., 2011; Tracy et al., 2008) are common pathways to long-term internalizing mental health problems.

Measuring Adult Self- Regulation

Novel to this study is the finding that manipulative behaviors are key components in conceptualizing and measuring adult SR skills. Manipulation can be described as a response to cope with feelings of fear, anxiety, and lack of control (Bowers, 2003). Since manipulation is used to gain a sense of control, it is relevant in measuring SR skills. Manipulative indicators as components of SR measures could expand understanding on the development of SR skills. Furthermore, manipulation is common in individuals with offending histories (DeLisi et al., 2014; Tulloch, 2010). Therefore, it is recommended

that future researchers consider including manipulative indicators in measuring adult SR skills, especially in individuals with delinquency behaviors.

Theoretical Implications

LCP suggests that early life experiences shape one's life course (Hutchinson, 2015). This claim is supported by the findings of the current study. In the current study, childhood adversity experiences were linked to multiple adult outcomes (e.g., mental health problems, AOD use, criminal behaviors, and adult SR deficiency). Also, JA was associated with adult SR deficiency. Together, VV, CM, EH, and JA experienced before age 18 were risk factors for multiple poor adult outcomes for youths with delinquency histories. However, the current results did not provide supporting evidence for adult SR deficiency as a turning point or intervening factor for the association between childhood adversity and adult outcomes, but the evidence of common and unique pathways between childhood adversity and adult outcomes suggest identifying and examining other possible intervening factors.

Regarding the transdiagnostic model, the current study did not provide supporting evidence for adult SR deficiency as a possible transdiagnostic factor for the association between childhood adversity and multiple poor adult outcomes. However, this research provides some support for McLaughlin's (2016) claim that experiences of deprivation and experiences of threat may have different pathways to maladaptive outcomes. For instance, EH, which represents experiences of deprivation, was the only childhood adversity linked to obesity and not associated with adult SR deficiency. Adversities representing experiences of threat (i.e., CM and VV) had no impact on obesity, but they were associated with adult SR deficiency.

Conclusion

The current research builds on the growing body of knowledge highlighting SR as a multidimensional behavioral construct with underlying emotional and cognitive processes. In this study, a valid and reliable measure of adult SR deficiency using the Add Health dataset comprised of risk-taking, sensation-seeking, impulsivity, and manipulative behaviors. In addition, this study adds to accumulating evidence of the high prevalence of childhood adversity among youths with delinquency histories. These youths are subsequently vulnerable to multiple poor adult outcomes, including mental health problems, AOD use, and criminal behaviors due to the exposure to childhood adversity incidents. They are also at increased risk of adult SR difficulties associated with exposure to CM, VV, and JA. These findings suggest the need for prevention services as well as trauma-informed policies and practices to mitigate the harm associated with childhood adversity and JA. Furthermore, additional research to identify possible pathways between childhood adversity and adult outcomes is needed.

REFERENCES

Abram, K. M., Teplin, L. A., Charles, D. R., Longworth, S. L., McClelland, G. M., & Dulcan, M. K. (2004). Posttraumatic stress disorder and trauma in youth in juvenile detention. *Archives of General Psychiatry, 61*(4), 403-410. https://doi.org/10.1001/archpsyc.61.4.403

Abram, K. M., Teplin, L. A., King, D. C., Longworth, S. L., Emanuel, K. M., Romero, E. G., & Olson, N. D. (2013). *PTSD, trauma, and comorbid psychiatric disorders in detained youth* (NCJ 239603). Office of Juvenile Justice and Delinquency Prevention. http://www.ojjdp.gov/pubs/239603.pdf

Add Health. (n.d.). *Frequently asked questions: Is Add Health data regulated by HIPPA?* https://www.cpc.unc.edu/projects/addhealth/faqs/index.html#is-add-health-data-regulated-by-hippa-

Aisenberg, E., & Herrenkohl, T. (2008). Community violence in context: Risk and resilience in children and families. *Journal of Interpersonal Violence, 23*(3), 296-315. https://doi.org/10.1177/0886260507312287

Aizer, A., & Doyle, J. J. (2015). Juvenile incarceration, human capital, and future crime: Evidence from randomly assigned judges. *The Quarterly Journal of Economics, 130*(2). 759–803. http://dx.doi.org/10.1093/qje/qjv003

Althubaiti A. (2016). Information bias in health research: Definition, pitfalls, and adjustment methods. *Journal of Multidisciplinary Healthcare, 9*, 211–217. https://doi.org/ 10.2147/JMDH.S104807

Anda, R. F., Butchart, A., Felitticul, V. J., & Brown, D. W. (2010). Building a framework for global surveillance of the public health implications of adverse childhood experiences. *American Journal of Preventive Medicine, 39*(1), 93-98. https://doi.org/10.1016/j.amepre.2010.03.015

Anda, R. F., Felitti, V. J., Bremner, J. D., Walker, J. D., Whitfield, C., Perry, B. D., Dube, S. R., & Giles, W. H. (2006).The enduring effects of abuse and related adverse experiences in childhood. *European Archives of Psychiatry & Clinical Neuroscience, 256*, 174–186. https://doi.org/10.1007/s00406-005-0624-4

Baglivio, M. T., Epps, N., Swartz, K., Sayedul Huq, M., Sheer, A., & Hardt, N. S. (2014). The prevalence of adverse childhood experiences (ACE) in the lives of juvenile offenders. *Journal of Juvenile Justice, 3*(2), 1–23. https://www.ncjrs.gov/pdffiles/246951.pdf

Barnert, E. S., Perry, R., & Morris, R. E. (2016). Juvenile incarceration and health. *Academic Pediatrics*, *16*(2), 99-109. https://doi.org/10.1016/j.acap.2015.09.004

Bartfeld, J. S., & Ahn, H. M. (2011). The school breakfast program strengthens household food security among low-income households with elementary school children. *The Journal of Nutrition*, *141*, 470-475. https://doi.org/10.3945/jn.110.130823.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182.

Baskin, D., & Sommers, I. (2014). Exposure to community violence and trajectories of violent offending. *Youth Violence and Juvenile Justice*, *12*(4), 367-385. https://doi.org/10.1177/1541204013506920

Basto-Pereira, M., & Maia, Â. (2018). Persistence in crime in young adults with a history of juvenile delinquency: The role of mental health and psychosocial problems. *International Journal of Mental Health and Addiction*, *16*, 496-506. https://doi.org/10.1007/s11469-017-9847-7

Basto-Pereira, M., Miranda, A., Ribeiro, S., & Maia, Â. (2016). Growing up with adversity: From juvenile justice involvement to criminal persistence and psychosocial problems in young adulthood. *Child Abuse & Neglect*, *62*, 63-75. http://dx.doi.org/10.1016/j.chiabu.2016.10.011

Beauducel, A., & Hilger, N. (2017). On the bias of factor score determinacy coefficients based on different estimation methods of the exploratory factor model. *Communications in Statistics Simulation and Computation*, *46*(8), 6144-6154. https://doi.org/10.1080/03610918.2016.1197247

Beaver, K. M., Ratchford, M., & Ferguson, C. J. (2009). Evidence of genetic and environmental effects on the development of low self-control. *Criminal Justice and Behavior*, *36*(11), 1158-1172. https://doi.org/10.1177/0093854809342859

Beck, A.J., Cantor, D., Hartge, J., & Smith, T. (2013*). Sexual victimization in juvenile facilities reported by youth, 2012: National Survey of Youth in Custody, 2012* (NCJ 241708). Bureau of Justice Statistics. https://www.bjs.gov/content/pub/pdf/svjfry12.pdf

Bellis, M. A., Hughes, K., Ford, K., Hardcastle, K. A., Sharp, C. A., Wood, S., Homolova, L., & Davies, A. (2018). Adverse childhood experiences and sources of childhood resilience: A retrospective study of their combined relationships with child health and educational attendance. *BioMed Central Public Health*, *18*, 792. https://doi.org/10.1186/s12889-018-5699-8

Bender, K. (2012). The mediating effect of school engagement in the relationship between youth maltreatment and juvenile delinquency. *Children & Schools, 34*(1), 37-48. https://doi.org/10.1093/cs/cdr001

Bender, K. (2010). Why do some maltreated youth become juvenile offenders?: A call for further investigation and adaptation of youth services. *Children and Youth Services Review, 32*(3), 466-473. https://doi.org/10.1016/j.childyouth.2009.10.022

Bender, K., Tripodi, S., Aguilar, J., & Thompson, S. (2010). Predicting arrest in early adulthood: The relationship between internal and external sources of control. *Social Work Research, 34*(1), 58-64. http://dx.doi.org/10.1093/swr/34.1.58

Bennett, D. A. (2001). How can I deal with missing data in my study?. *Australian and New Zealand Journal of Public Health*, *25*(5), 464-469.

Berking, M., & Wupperman, P. (2012). Emotion regulation and mental health: recent findings, current challenges, and future directions. *Current Opinion in Psychiatry, 25*, 128-134. https://doi.org/10.1097/YCO.0b013e3283503669

Binswanger, I. A., Krueger, P. M., & Steiner, J. F. (2009). Prevalence of chronic medical conditions among jail and prison inmates in the USA compared with the general population. *Journal of Epidemiology & Community Health, 63*(11), 912-919. https://doi.org/10.1136/jech.2009.090662

Blair, C. (2010). Stress and the development of self-regulation in context. *Child Development Perspectives, 4*(3), 181-188. https://doi.org/10.1111/j.1750-8606.2010.00145.x

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best practices for developing and validating scales for health, social, and behavioral research: a primer. *Frontiers in Public Health, 6*, 149- https://doi.org/ 10.3389/fpubh.2018.00149

Bollen, K., & Long, S. (Eds). (1993). *Testing structural equation models*. Sage Publications.

Bowers, E. P., Gestsdottir, S., Geldhof, G. J., Nikitin, J., von Eye, A., & Lerner, R. M. (2011). Developmental trajectories of intentional self-regulation in adolescence: The role of parenting and implications for positive and problematic outcomes among diverse youth. *Journal of Adolescence, 34*(6), 1193-1206. https://doi.org/10.1016/j.adolescence.2011.07.006

Bowers, L. (2003). Manipulation: searching for an understanding. *Journal of Psychiatric and Mental Health Nursing, 10*, 329-334.

Branson, C. E., Baetz, C. L., Horwitz, S. M., & Hoagwood, K. E. (2017). Trauma-informed juvenile justice systems: A systematic review of definitions and core components. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*, 635–646. http://dx.doi.org/10.1037/tra0000255

Brook, J. S., Lee, J. Y., Finch, S. J., Brown, E. N., & Brook, D. W. (2013). Long-term consequences of membership in trajectory groups of delinquent behavior in an urban sample: Violence, drug use, interpersonal, and neighborhood attributes. *Aggressive Behavior, 39*(6), 440-452. https://doi.org/10.1002/ab.21493

Brown, T. A. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). The Guilford Press.

Byrne, B.M (2011). Structural Equation Modeling with Mplus: Basic concepts, applications, and programming (Multivariate Applications Series) (1st ed.). Routledge

Buckner, J. C., Mezzacappa, E., & Beardslee, W. R. (2009). Self-regulation and its relations to adaptive functioning in low income youths. *American Journal of Orthopsychiatry, 79*, 19-30. https://doi.org/10.1037/a0014796

Buker, H. (2011). Formation of self-control: Gottfredson and Hirschi's general theory of crime and beyond. *Aggression and Violent Behavior, 16*(3), 265-276. https://doi.org/10.1016/j.avb.2011.03.005

Bunch, J. M., Iratzoqui, A., & Watts, S. J. (2018). Child abuse, self-control, and delinquency: A general strain perspective. *Journal of Criminal Justice, 56*, 20-28. http://dx.doi.org/10.1016/j.jcrimjus.2017.09.009

Burrell, S. (2013). Trauma and the Environment of Care in Juvenile Institutions. National Center for Child Traumatic Stress. https://www.nctsn.org/resources/trauma-and-environment-care-juvenile institutions

Cabrera-Nguyen, P. (2010). Author guidelines for reporting scale development and validation results in the Journal of the Society for Social Work and Research. *Journal of the Society for Social Work and Research, 1*(2), 99-103. https://doi.org/10.5243/jsswr.2010.8

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*(2), 245-276. https://doi.org/10.1207/s15327906mbr0102_10

Centers for Disease Control and Prevention. (2000). *Measuring healthy days: Population assessment of health-related quality of life*. https://www.cdc.gov/hrqol/pdfs/mhd.pdf

Centers for Disease Control and Prevention. (2019a). *Adverse Childhood Experiences (ACEs): Preventing early trauma to improve adult health*. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. https://www.cdc.gov/vitalsigns/aces/index.html

Centers for Disease Control and Prevention. (2019b). *Preventing adverse childhood experiences (ACEs): Leveraging the best available evidence*. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. https://www.cdc.gov/violenceprevention/pdf/preventingACES-508.pdf

Centers for Disease Control and Prevention. (2020a). *10 Leading causes of death, United States- 2018*. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. https://www.cdc.gov/injury/wisqars/LeadingCauses.html

Centers for Disease Control and Prevention. (2020b). Overweight & obesity: Adult obesity causes & consequences. Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion. https://www.cdc.gov/obesity/adult/causes.html

Center for Juvenile Justice Reform. (2015). *The Crossover Youth Practice Model (CYPM): An Abbreviated*. Georgetown University Center for Juvenile Justice Reform. https://cjjr.georgetown.edu/wp-content/uploads/2015/09/CYPM-Abbreviated-Guide.pdf

Chamorro, J., Bernardi, S., Potenza, M. N., Grant, J. E., Marsh, R., Wang, S., & Blanco, C. (2012). Impulsivity in the general population: A national study. *Journal of Psychiatric Research*, *46*, 994-1001. https://doi.org/10.1016/j.jpsychires.2012.04.023

Chen, P. & Chantala, K. (2014). *Guidelines for analyzing the Add Health data.* Carolina Population Center, University of North Carolina at Chapel Hill. http://www.cpc.unc.edu/projects/addhealth/documentation/guides/wt-guidelines.pdf

Chen, W. Y., Propp, J., & Lee, Y. (2015). Connection between adolescent's exposure to community violence and future civic engagement behaviors during their young adulthood. *Child and Adolescent Social Work Journal*, *32*, 45-55. https://doi.org/10.1007/s10560-014-0361-5

Child and Adolescent Health Measurement Initiative. (n.d). *2017-2018 National Survey of Children's Health (NSCH) data query.* Data Resource Center for Child and Adolescent Health supported by Cooperative Agreement U59MC27866 from the U.S. Department of Health and Human Services, Health Resources and Services Administration's Maternal and Child Health Bureau. https://www.childhealthdata.org/browse/survey/results?q=7211&r=1

Chiu, Y. L., Ryan, J. P., & Herz, D. C. (2011). Allegations of maltreatment and delinquency: Does risk of juvenile arrest vary substantiation status?. *Children and Youth Services Review*, *33*(6), 855-860. https://doi.org/10.1016/j.childyouth.2010.12.007

Chung, H. L., & Steinberg, L. (2006). Relations between neighborhood factors, parenting behaviors, peer deviance, and delinquency among serious juvenile offenders. *Developmental Psychology*, *42*(2), 319-331. https://doi.org/doi:10.1037/0012-1649.42.2.319

Cloitre, M., Khan, C., Mackintosh, M. A., Garvert, D. W., Henn-Haase, C. M., Falvey, E. C., & Saito, J. (2019). Emotion regulation mediates the relationship between ACES and physical and mental health. *Psychological Trauma: Theory, Research, Practice, and Policy*, *11*(1), 82-89. https://doi.org/10.1037/tra0000374

Cohen, J. A., Mannarino, A. P., Jankowski, K., Rosenberg, S., Kodya, S., & Wolford, G. L. (2016). A randomized implementation study of trauma-focused cognitive behavioral therapy for adjudicated teens in residential treatment facilities. *Child Maltreatment*, *21*, 156–167. https://doi.org/10.1177/1077559515624775

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24* (4), 385-396. https://doi.org/10.2307/2136404

Colins, O., Vermeiren, R., Vreugdenhil, C., van den Brink, W., Doreleijers, T., & Broekaert, E. (2010). Psychiatric disorders in detained male adolescents: A systematic literature review. *The Canadian Journal of Psychiatry*, *55*(4), 255-263. https://doi.org/10.1177/070674371005500409

Colman, R. A., Kim, D. H., Mitchell-Herzfeld, S., & Shady, T. A. (2009). *Long-term consequences of delinquency: Child maltreatment and crime in early adulthood*. https://www.ncjrs.gov/pdffiles1/nij/grants/226577.pdf

Colman, R. A., Mitchell-Herzfeld, S., & Shady, T. A. (2010). From delinquency to the perpetration of child maltreatment: Examining the early adult criminal justice and child welfare involvement of youth released from juvenile justice facilities. *Children and Youth Services Review*, *32*(10), 1410-1417. https://doi.org/10.1016/j.childyouth.2010.06.010

Connolly, E. J., & Kavish, N. (2019). The causal relationship between childhood adversity and developmental trajectories of delinquency: A consideration of genetic and environmental confounds. *Journal of Youth and Adolescence, 48,* 199-211. https://doi.org/10.1007/s10964-018-0960-0

Cooley-Strickland, M., Quille, T. J., Griffin, R. S., Stuart, E. A., Bradshaw, C. P., & Furr-Holden, D. (2009). Community violence and youth: Affect, behavior, substance use, and academics. *Clinical Child and Family Psychology Review, 12*(2), 127-156. https://doi.org/10.1007/s10567-009-0051-6

Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation, 10,* Article 7. https://scholarworks.umass.edu/pare/vol10/iss1/7

Crandall, A., Deater-Deckard, K., & Riley, A. W. (2015). Maternal emotion and cognitive control capacities and parenting: A conceptual framework. *Developmental Review, 36,* 105–126. http://dx.doi.org/10.1016/j.dr.2015.01.004

Culhane, D. P., Byrne, T., Metraux, S., Moreno, M., Toros, H., & Stevens, M. (2011). Young adult outcomes of youth exiting dependent or delinquent care in Los Angeles County. http://www.socalgrantmakers.org/sites/default/files/resources/Foster%20Youth_LA_County_Report.pdf

Currie, J., & Tekin, E. (2006). *Does child abuse cause crime?* (Working Paper 12171). National Bureau of Economic Research. http://www.nber.org/papers/w12171.pdf

Dahlberg, L.L., & Mercy, J. A. (2009). *The history of violence as a public health issue*. Centers for Disease Control and Prevention. http://www.cdc.gov/violenceprevention/pdf/history_violence-a.pdf

Dassen, F., Houben, K., Allom, V., & Jansen, A. (2018). Self-regulation and obesity: The role of executive function and delay discounting in the prediction of weight loss. *Journal of Behavioral Medicine, 41*(6), 806–818. https://doi.org/10.1007/s10865-018-9940-9

David-Ferdon, C., Vivolo-Kantor, A. M., Dahlberg, L. L., Marshall, K. J., Rainford, N. & Hall, J. E. (2016). *A Comprehensive Technical Package for the Prevention of Youth Violence and Associated Risk Behaviors*. National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. https://www.cdc.gov/violenceprevention/pdf/yv-technicalpackage.pdf

de Carvalho, J., & Chima, F. O. (2014). Applications of structural equation modeling in social sciences research. *American International Journal of Contemporary Research, 4*, 6-11. http://www.aijcrnet.com/journals/Vol_4_No_1_January_2014/2.pdf

DeHart, D., Lynch, S., Belknap, J., Dass-Brailsford, P., & Green, B. (2014). Life history models of female offending the roles of serious mental illness and trauma in women's pathways to jail. *Psychology of Women Quarterly*, *38*(1), 138-151. https://doi.org/10.1177/0361684313494357

DeLisi, M., Dansby, T., Peters, D. J., Vaughn, M. G., Shook, J. J., & Hochstetler, A. (2014). Fledgling psychopathic features and pathological delinquency: New evidence. *American Journal of Criminal Justice, 39*, 411-424. https://doi.org/10.1007/s12103-013-9218-2

Diamond, B., Morris, R. G., & Piquero, A. R. (2017). Stability in the underlying constructs of self-control. *Crime & Delinquency*, *63*(3), 235-266. https://doi.org/10.1177/0011128715603721

Dierkhising, C. B., Ko, S. J., Woods-Jaeger, B., Briggs, E. C., Lee, R., & Pynoos, R. S. (2013). Trauma histories among justice-involved youth: Findings from the National Child Traumatic Stress Network. *European Journal of Psychotraumatology*, *4*, Article 20274. http://dx.doi.org/10.3402/ejpt.v4i0.20274

Duckworth, A. L., & Kern, M. L. (2011). A meta-analysis of the convergent validity of self-control measures. *Journal of Research in Personality*, *45*, 259-268. https://doi.org/10.1016/j.jrp.2011.02.004

Duncan, G. J., Magnuson, K., Kalil, A., & Ziol-Guest, K. (2012). The importance of early childhood poverty. *Social Indicators Research*, *108*, 87-98. DOI 10.1007/s11205-011-9867-9

Dvir, Y., Ford, J. D., Hill, M., & Frazier, J. A. (2014). Childhood maltreatment, emotional dysregulation, and psychiatric comorbidities. *Harvard Review of Psychiatry*, *22*(3), 149-161. https://doi.org/10.1097/HRP.0000000000000014

Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy*, *1*(3), 192-205. https://doi.org/10.1680/ijct.2008.1.3.192

English, D.J., Widom, C.S., & Brandford, C. (2002). *Childhood victimization and delinquency, adult criminality, and violent criminal behavior: A replication and extension* (Final Report No. 192291). https://www.ncjrs.gov/pdffiles1/nij/grants/192291.pdf

Evans, G. W., & Kim, P. (2013). Childhood poverty, chronic stress, self-regulation, and coping. *Child Development Perspectives, 7*(1), 43-48. https://doi.org/10.1111/cdep.12013

Evans, G. W., & Kim, P. (2012). Childhood poverty and young adults' allostatic load: the mediating role of childhood cumulative risk exposure. *Psychological Science, 23*(9), 979-983. https://doi.org/10.1177/0956797612441218

Evans, S. Z., Simons, L. G., & Simons, R. L. (2016). Factors that influence trajectories of delinquency throughout adolescence. *Journal of Youth and Adolescence*, *45*, 156-171. https://doi.org/10.1007/s10964-014-0197-5

Evans-Chase, M. (2014). Addressing trauma and psychosocial development in juvenile justice-involved youth: A synthesis of the developmental neuroscience, juvenile justice and trauma literature. *Laws*, *3*(4), 744-758. https://doi.org/10.3390/laws3040744

Fan, M., & Jin, Y. (2013). Obesity and self-control: Food consumption, physical activity, and weight-loss intention. *Applied Economic Perspectives and Policy*, *36*(1), 125-145. https://doi.org/10.1093/aepp/ppt034

Farrell, J., Betsinger, A., & Hammond, P. (2018). *Best practices in youth diversion: Literature review for the Baltimore city youth diversion committee*. The Institute for Innovation & Implementation, University of Maryland School of Social Work. https://theinstitute.umaryland.edu/media/ssw/institute/md-center-documents/Youth-Diversion-Literature-Review.pdf

Farrington, D. P. (2010). Family influences on delinquency. In D. W. Springer, & A. R. Roberts (Eds.), Juvenile Justice and Delinquency (pp. 203–222). Mass, Jones and Bartlett: Sudbury.

Farrington, D. P., Coid, J. W., Harnett, L., Jolliffe, D., Soteriou, N., Turner, R., & West, D. J. (2006). Criminal careers up to age 50 and life success up to age 48: New findings from the Cambridge Study in delinquent development (2nd ed.). Home Office Research, Development and Statistics Directorate. http://mws73973.mws3.csx.cam.ac.uk/people/academic_research/david_farrington/hors299.pdf

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39* (2), 175-191. https://doi.org/10.3758/bf03193146

Fava, N. M., Trucco, E. M., Martz, M. E., Cope, L. M., Jester, J. M., Zucker, R. A., & Heitzeg, M. M. (2018). Childhood adversity, externalizing behavior, and substance use in adolescence: Mediating effects of anterior cingulate cortex activation during inhibitory errors. *Development and Psychopathology*, 31, 1439-1450. https://doi.org/10.1017/S0954579418001025

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine, 14*(4), 245–258. https://doi.org/10.1016/S0749-3797(98)00017-8

Field, A. (2012). Discovering statistics using IBM SPSS statistics (4th ed.). Sage

Fisher, H. L., Craig, T. K., Fearon, P., Morgan, K., Dazzan, P., Lappin, J., Hutchinson, G., Doody, G. A., Jones, P. B., McGuffin, P., Murray, R. M., Leff, J., & Morgan, C. (2011). Reliability and comparability of psychosis patients' retrospective reports of childhood abuse. *Schizophrenia Bulletin, 37*(3), 546–553. https://doi.org/10.1093/schbul/sbp103

Floyd, F. J., & Widaman, K. F. (1995). Factor analysis in the development and refinement of clinical assessment instruments. *Psychological Assessment, 7*(3), 286-299. https://doi.org/10.1037/1040-3590.7.3.286

Semega, J., Kollar, M., Creamer, J., & Mohanty, A. (2019). Income and poverty in the United States: 2018: Current Population Reports (P60-266). U.S. Government Printing Office. https://www.census.gov/content/dam/Census/library/publications/2019/demo/p60-266.pdf

Ford, J. D., & Blaustein, M. E. (2013). Systemic self-regulation: A framework for trauma-informed services in residential juvenile justice programs. *Journal of Family Violence, 28*(7), 665-677. https://doi.org/10.1007/s10896-013-9538-5

Ford, J. D., & Hawke, J. (2012). Trauma affect regulation psychoeducation group and milieu intervention outcomes in juvenile detention facilities. *Journal of Aggression, Maltreatment & Trauma, 21*, 365–384. https://doi.org/10.1080/10926771.2012.673538

Fornell, C. & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*, 39-50. https://doi.org/10.1177/002224378101800104

Fowler, P. J., Tompsett, C. J., Braciszewski, J. M., Jacques-Tiura, A. J., & Baltes, B. B. (2009). Community violence: A meta-analysis on the effect of exposure and mental health outcomes of children and adolescents. *Development and Psychopathology, 21,* 227-259. https://doi.org/10.1017/S0954579409000145

Frazier, P. A., Tix, A. P., & Barron, K. E. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51,* 115-134. https://doi.org/10.1037/0022-0167.51.1.115

Freudenberg, N., Daniels, J., Crum, M., Perkins, T., & Richie, B. E. (2005). Coming home from jail: the social and health consequences of community reentry for women, male adolescents, and their families and communities. *American Journal of Public Health, 95*(10), 1725-1736. https://doi.org/10.2105/AJPH.2004.056325

Gates, M. L., & Bradford, R. K. (2015). The impact of incarceration on obesity: Are prisoners with chronic diseases becoming overweight and obese during their confinement?. *Journal of Obesity, 2015*, Article 532468. http://dx.doi.org/10.1155/2015/532468

Gibb, S. J., Fergusson, D. M., & Horwood, L. J. (2012). Childhood family income and life outcomes in adulthood: Findings from a 30-year longitudinal study in New Zealand. *Social Science & Medicine, 74*(12), 1979-1986. https://doi.org/10.1016/j.socscimed.2012.02.028

Gomes, H. S., Maia, Â., & Farrington, D. P. (2018). Measuring offending: Self-reports, official records, systematic observation and experimentation. *Crime Psychology Review*, *4*(1), 26-44. https://doi.org/10.1080/23744006.2018.1475455

Gorey, K. M., Richter, N. L., & Snider, E. (2001). Guilt, isolation and hopelessness among female survivors of childhood sexual abuse: Effectiveness of group work intervention. *Child Abuse & Neglect*, *25*(3), 347-355. https://doi.org/10.1016/S0145-2134(00)00255-6

Gottfredson, M., & Hirschi, T. (1990). *A general theory of crime*. Stanford University Press.

Grasmick, H. G., Tittle, C. R., Bursik, R. J., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, *30*(1), 5–29. https://doi.org/10.1177/0022427893030001002

Gruenewald P. J. (2011). Regulating availability: How access to alcohol affects drinking and problems in youth and adults. *Alcohol Research: Current Reviews*, *34*(2), 248–256.

Gundersen, C., & Ziliak, J. P. (2015). Food insecurity and health outcomes. *Health Affairs*, *34*(11), 1830-1839. https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2015.0645

Hails, K.A., Zhou, Y. & Shaw, D.S. (2019). The mediating effect of self-regulation in the association between poverty and child weight: A systematic review. *Clinical Child and Family Psychology Review*, *22*, 290–315. https://doi.org/10.1007/s10567-019-00279-z

Hamoudi, A., Murray, D. W., Sorensen, L., & Fontaine, A. (2015). *Self-regulation and toxic stress: A review of ecological, biological, and developmental studies of self-regulation and stress* (OPRE Report # 2015-30). Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. https://www.acf.hhs.gov/sites/default/files/opre/acf_report_2_rev_022415_final_508.pdf

Hanson, J. L., Chung, M. K., Avants, B. B., Shirtcliff, E. A., Gee, J. C., Davidson, R. J., & Pollak, S. D. (2010). Early stress is associated with alterations in the orbitofrontal cortex: a tensor-based morphometry investigation of brain structure and behavioral risk. *Journal of Neuroscience*, *30*(22), 7466-7472. https://doi.org/10.1523/JNEUROSCI.0859-10.2010

Hartinger-Saunders, R. M., Rine, C. M., Nochajski, T., & Wieczorek, W. (2012). Neighborhood Crime and Perception of Safety as Predictors of Victimization and Offending Among Youth: A Call for Macro-Level Prevention and Intervention Models. *Children and Youth Services Review*, *34*(9), 1966–1973. https://doi.org/10.1016/j.childyouth.2012.05.020

Harris, K.M. (2013). *The Add Health study: Design and accomplishments*. Carolina Population Center, University of North Carolina at Chapel Hill. https://www.cpc.unc.edu/projects/addhealth/documentation/guides/DesignPaperWIIV.pdf

Harris, K.M., Halpern, C.T., Whitsel, E., Hussey, J., Tabor, J., Entzel, P. & Udry, J.R. (2009). *The National Longitudinal Study of Adolescent to Adult Health: Research design*. https://www.cpc.unc.edu/projects/addhealth/design/researchdesign_3618_regular.pdf

Hart, H., & Rubia, K. (2012). Neuroimaging of child abuse: A critical review. *Frontiers in Human Neuroscience, 6*, Article 52. https://doi.org/10.3389/fnhum.2012.00052

Hay, C., & Forrest, W. (2006). The development of self-control: Examining self-control theory's stability thesis. *Criminology*, *44*(4), 739-774. https://doi.org/10.1111/j.1745-9125.2006.00062.x

Heleniak, C., Jenness, J. L., Stoep, A. V., McCauley, E., & McLaughlin, K. A. (2016). Childhood maltreatment exposure and disruptions in emotion regulation: A transdiagnostic pathway to adolescent internalizing and externalizing psychopathology. *Cognitive Therapy and Research, 40*(3), 394–415. https://doi.org/10.1007/s10608-015-9735-z

Henggeler, S.W. & Schoenwald, S.K. (2011). Evidence-based interventions for juvenile offenders and juvenile justice policies that support them. *Social policy Report, 25*(1), 1-28. https://doi.org/10.1002/j.2379-3988.2011.tb00066.x

Henry, K. L., Knight, K. E., & Thornberry, T. P. (2012). School disengagement as a predictor of dropout, delinquency, and problem substance use during adolescence and early adulthood. *Journal of Youth and Adolescence, 41*, 156–166. https://doi.org/10.1007/s10964-011-9665-3

Herrenkohl, T. I., Jung, H., Lee, J. O., & Kim, M.-H. (2017). Effects of child maltreatment, cumulative victimization experiences, and proximal life stress on adult crime and antisocial behavior. https://www.ncjrs.gov/pdffiles1/nij/grants/250506.pdf

Hockenberry, S., & Puzzanchera, C. (2018). *Juvenile court statistics 2016*. National Center for Juvenile Justice. https://www.ojjdp.gov/ojstatbb/njcda/pdf/jcs2016.pdf

Hoeve, M., Dubas, J. S., Eichelsheim, V. I., Van der Laan, P. H., Smeenk, W., & Gerris, J. R. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology*, *37*(6), 749-775. https://doi.org/10.1007/s10802-009-9310-8.

Hoffmann, J. P. (2018). Academic underachievement and delinquent behavior. *Youth & Society*, 1-28. https://doi.org/10.1177/0044118X18767035

Holman, B., & Ziedenberg, J. (2006). The dangers of detention: The impact of incarcerating youth in detention and other secure facilities. Justice Policy Institute. http://www.justicepolicy.org/images/upload/0611_rep_dangersofdetention_jj.pdf

Hu, L.-T., & Bentler, P.M. (1999) Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hunter, J. A. (2010). Prolonged exposure treatment of chronic PTSD in juvenile sex offenders: Promising results from two case studies. *Child & Youth Care Forum, 39*, 367–384. https://doi.org/10.1007/s10566-010-9108-4

Hutchinson, E. D. (2015). A life course perspective. In E.D. Hutchinson (Ed.), *Dimensions of human behavior: The changing life course* (5th ed., pp. 1-38). Sage Publications

Isasi, C.R., Jung, M., Parrinello, C.M., Kaplan, R.C., Kim, R., Crespo, N.C., Gonzalez, P., Gouskova, N.A., Penedo, F.J., Perreira, K.M., Perrino, T., Sotres-Alvarez, D., Van Horn, L., & Gallo, L.C. (2016). Association of childhood economic hardship with adult height and adult adiposity among Hispanics/Latinos. The HCHS/SOL socio-cultural ancillary study. *PLOS ONE*, *11*(2), Article e0149923. https://doi.org/10.1371/journal.pone.0149923

Jackson, D. B., & Beaver, K. M. (2013). The influence of neuropsychological deficits in early childhood on low self-control and misconduct through early adolescence. *Journal of Criminal Justice*, *41* (4), 243-251. https://doi.org/10.1016/j.jcrimjus.2013.05.002

Jaggers, J. W., Robison, S. B., Rhodes, J. L., Guan, X., & Church, W. T. (2016). Predicting adult criminality among Louisiana's urban youth: Poverty, academic risk, and delinquency. *Journal of the Society for Social Work and Research, 7,* 89-116. https://doi: 10.1086/685089.

Jarjoura, G. R., Triplett, R. A., & Brinker, G. P. (2002). Growing up poor: Examining the link between persistent childhood poverty and delinquency. *Journal of Quantitative Criminology, 18*(2), 159-187.

Jones, C. M., Merrick, M. T., & Houry, D. E. (2020). Identifying and preventing adverse childhood experiences: implications for clinical practice. *Journal of the American Medical Association*, *323*(1), 25-26.

Jones, S. M., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies and commentaries. *Social Policy Report*, *26*(4), 1-33. https://doi.org/10.1002/j.2379-3988.2012.tb00073.x

Jonson-Reid, M., Kohl, P. L., & Drake, B. (2012). Child and adult outcomes of chronic child maltreatment. *Pediatrics*, *129*(5), 839–845. https://doi:10.1542/peds.2011-2529

Jung, H., Herrenkohl, T. I., Lee, J. O., Hemphill, S. A., Heerde, J. A., & Skinner, M. L. (2017). Gendered pathways from child abuse to adult crime through internalizing and externalizing behaviors in childhood and adolescence. *Journal of Interpersonal Violence*, *32*(18), 2724-2750. https://doi.org/10.1177/0886260515596146

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, *20*, 141-151. https://doi.org/10.1177/001316446002000116

Kaplow, J. B., & Widom, C. S. (2007). Age of onset of child maltreatment predicts long-term mental health outcomes. *Journal of abnormal Psychology*, *116*(1), 176-187. https://doi.org/10.1037/0021-843X.116.1.176

Kent, A. (2009). *Youth from low income families*. Office of the Assistant Secretary for Planning and Evaluation https://aspe.hhs.gov/sites/default/files/pdf/75846/index.pdf

Kessler, R. C., Davis, C. G., & Kendler, K. S. (1997). Childhood adversity and adult psychiatric disorder in the US National Comorbidity Survey. *Psychological Medicine*, *27*(5), 1101-1119.

Kim, H. Y. (2013). Statistical notes for clinical researchers: assessing normal distribution (2) using skewness and kurtosis. *Restorative Dentistry & Endodontics*, *38*(1), 52-54. https://doi.org/10.5395/rde.2013.38.1.52

Kim, J., & Cicchetti, D. (2010). Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. *Journal of Child Psychology and Psychiatry*, *51*(6), 706-716. https://doi.org/10.1111/j.1469-7610.2009.02202.x

Kim, P., Evans, G. W., Angstadt, M., Ho, S. S., Sripada, C. S., Swain, J. E., Liberzon, I., & Phan, K. L. (2013). Effects of childhood poverty and chronic stress on emotion regulatory brain function in adulthood. *Proceedings of the National Academy of Sciences*, *110*(46), 18442-18447. https://doi.org/10.1073/pnas.1308240110

Kirk, D. S., & Sampson, R. J. (2013). Juvenile arrest and collateral educational damage in the transition to adulthood. *Sociology of Education*, *86*(1), 36-62. https://doi.org/10.1177/0038040712448862

Kline, R.B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). The Guilford Press.

Lambert, H. K., King, K. M., Monahan, K. C., & McLaughlin, K. A. (2017). Differential associations of threat and deprivation with emotion regulation and cognitive control in adolescence. *Development and Psychopathology, 29*(3), 929-940. https://doi.org/10.1017/S0954579416000584

Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The sources of four commonly reported cutoff criteria: What did they really say?. *Organizational Research Methods, 9*(2), 202-220. https://doi.org/10.1177/1094428105284919

Lantos, H., Wilkinson, A., Winslow, H., & McDaniel, T. (2019). Describing associations between child maltreatment frequency and the frequency and timing of subsequent delinquent or criminal behaviors across development: Variation by sex, sexual orientation, and race. *BMC Public Health*, *19*, 1-12. https://doi.org/10.1186/s12889-019-7655-7

Larson, N. I., & Story, M. T. (2011). Food insecurity and weight status among US children and families: A review of the literature. American Journal of Preventive Medicine, 40(2), 166-173. https://doi/org.10.1016/j.amepre.2010.10.028

Lee, C. T., McClernon, F. J., Kollins, S. H., Prybol, K., & Fuemmeler, B. F. (2013). Childhood economic strains in predicting substance use in emerging adulthood: Mediation effects of youth self-control and parenting practices. *Journal of Pediatric Psychology*, *38*(10), 1130-1143. https://doi.org/10.1093/jpepsy/jst056

Lefebvre, R., Fallon, B., Van Wert, M., & Filippelli, J. (2017). Examining the relationship between economic hardship and child maltreatment using data from the Ontario Incidence Study of Reported Child Abuse and Neglect-2013 *Behavioral Sciences, 7*(6), 1-12. https://doi.org/10.3390/bs7010006

LeTendre, M. L., & Reed, M. B. (2017). The effect of adverse childhood experience on clinical diagnosis of a substance use disorder: Results of a nationally representative study. *Substance Use & Misuse*, *52*(6), 689–697. https://doi.org/10.1080/10826084.2016.1253746

Levitt, L. (2010). The comparative risk of mistreatment for juveniles in detention facilities and state prisons. *International Journal of Forensic Mental Health, 9* (1), 44-54. https://doi.org/10.1080/14999013.2010.483344

Li, Y., & Huang, H. (2017). Validating the Job Satisfaction Survey in voluntary child welfare. *Children and Youth Services Review*, *83*, 1-8. https://doi.org/10.1016/j.childyouth.2017.10.020

Lopes, G., Krohn, M. D., Lizotte, A. J., Schmidt, N. M., Vasquez, B. E., & Bernburg, J. G. (2012). Labeling and cumulative disadvantage: The impact of formal police intervention on life chances and crime during emerging adulthood. *Crime & Delinquency*, *58*(3), 456-488. https://doi.org/10.1177/0011128712436414

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, *1*(2), 130-149. https://doi.org/10.1037/1082-989X.1.2.130

Macmillan, R., & Hagan, J. (2004). Violence in the transition to adulthood: Adolescent victimization, education, and socioeconomic attainment in later life. *Journal of Research on Adolescence*, *14*(2), 127-158. https://doi.org/10.1111/j.1532-

Maguire-Jack, K., & Font, S. A. (2017). Intersections of individual and neighborhood disadvantage: Implications for child maltreatment. *Children and Youth Services Review*, *72*, 44-51. http://dx.doi.org/10.1016/j.childyouth.2016.10.015

Mallett, C. A. (2015). The incarceration of seriously traumatised adolescents in the USA: Limited progress and significant harm. *Criminal Behaviour and Mental Health*, *25*, 1–9. https://doi.org/10.1002/cbm.1946

Maslowsky, J., Jager, J., & Hemken, D. (2015). Estimating and interpreting latent variable interactions: A tutorial for applying the latent moderated structural equations method. *International Journal of Behavioral Development*, 39(1), 87-96. https://doi.org/10.1177/0165025414552301

McClelland, M., Geldhof, J., Morrison, F., Gestsdóttir, S., Cameron, C., Bowers, E., Duckworth, A., Little, T., & Grammer, J. (2018). Self-regulation. In N. Halfon, C.B. Forrest, R. M. Lerner, & E. M. Faustman (Eds.), *Handbook of life course health development* (pp. 275-298). Springer. https://link.springer.com/content/pdf/10.1007%2F978-3-319-47143-3.pdf

McCrory, E., De Brito, S. A., & Viding, E. (2010). Research review: The neurobiology and genetics of maltreatment and adversity. *Journal of Child Psychology and Psychiatry*, *51*(10), 1079-1095. https://doi/org/10.1111/j.1469-7610.2010.02271.x

McCrory, E., De Brito, S. A., & Viding, E. (2011). The impact of childhood maltreatment: A review of neurobiological and genetic factors. *Frontiers in Psychiatry*, *2*, Article 48. https://doi.org/10.3389/fpsyt.2011.00048

McCrory, E. J., Gerin, M. I., & Viding, E. (2017). Annual research review: Childhood maltreatment, latent vulnerability and the shift to preventative psychiatry–the contribution of functional brain imaging. *Journal of Child Psychology and Psychiatry*, *58*(4), 338-357. https://doi.org/10.1111/jcpp.12713.

McInerney, M. & McKlindon, A. (2014). *Unlocking the door to learning: Trauma-informed classrooms & transformational schools*. Education Law Center. https://www.elc-pa.org/wp-content/uploads/2015/06/Trauma-Informed-in-Schools-Classrooms-FINAL-December2014-2.pdf

McLaughlin, K. A. (2016). Future directions in childhood adversity and youth psychopathology. *Journal of Clinical Child & Adolescent Psychology*, *45*(3), 361-382. https://doi.org/10.1080/15374416.2015.1110823

McLaughlin, K. A., Green, J. G., Gruber, M. J., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2012). Childhood adversities and first onset of psychiatric disorders in a national sample of US adolescents. *Archives of General Psychiatry*, *69*(11), 1151-1160. https://doi:10.1001/archgenpsychiatry.2011.2277

McLaughlin, K. A., Peverill, M., Gold, A. L., Alves, S., & Sheridan, M. A. (2015). Child maltreatment and neural systems underlying emotion regulation. *Journal of the American Academy of Child & Adolescent Psychiatry*, *54*(9), 753-762. https://doi.org/10.1016/j.jaac.2015.06.010

Meldrum, R. C., Campion Young, B., Soor, S., Hay, C., Copp, J. E., Trace, M., Smith-Darden, J.P., & Kernsmith, P. D. (2019). Are adverse childhood experiences associated with deficits in self-control? A test among two independent samples of youth. *Criminal Justice and Behavior*, *47*(2), 166-186. https://doi.org/10.1177/0093854819879741

Merrick, M. T., Ford, D. C., Ports, K. A., & Guinn, A. S. (2018). Prevalence of adverse childhood experiences from the 2011-2014 behavioral risk factor surveillance system in 23 states. *JAMA Pediatrics*, *172*(11), 1038-1044. https://doi:10.1001/jamapediatrics.2018.2537.

Mersky, J. P., & Reynolds, A. J. (2007). Child maltreatment and violent delinquency: disentangling main effects and subgroup effects. *Child Maltreatment*, *12*(2), 246-258. https://doi.org/10.1177/1077559507301842

Mersky, J. P., & Topitzes, J. (2010). Comparing early adult outcomes of maltreated and non-maltreated children: A prospective longitudinal investigation. *Children and Youth Services Review*, *32*(8), 1086-1096. https://doi.org/10.1016/j.childyouth.2009.10.018

Mersky, J. P., Topitzes, J., & Reynolds, A. J. (2012). Unsafe at any age linking childhood and adolescent maltreatment to delinquency and crime. *Journal of Research in Crime and Delinquency*, *49*(2), 295-318. https://doi.org/10.1177/0022427811415284

Min, M. O., Minnes, S., Kim, H., & Singer, L. T. (2013). Pathways linking childhood maltreatment and adult physical health. *Child Abuse & Neglect, 37*(6), 361-373. Httpe://doi.org/10.1016/j.chiabu.2012.09.008

Minh, A., Matheson, F., Daoud, N., Hamilton-Wright, S., Pedersen, C., Borenstein, H., & O'Campo, P. (2013). Linking childhood and adult criminality: Using a life course framework to examine childhood abuse and neglect, substance use and adult partner violence. *International Journal of Environmental Research and Public Health, 10*(11), 5470-5489. https://doi.org10.3390/ijerph10115470

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., Houts, R., Poulton, R., Roberts, B.W., Ross, S., Sears, M.R., Thomson , W.M., & Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences, 108*(7), 2693-2698. www.pnas.org/cgi/doi/10.1073/pnas.1010076108

Monahan, K. C., King, K. M., Shulman, E. P., Cauffman, E., & Chassin, L. (2015). The effects of violence exposure on the development of impulse control and future orientation across adolescence and early adulthood: Time-specific and generalized effects in a sample of juvenile offenders. *Development and Psychopathology, 27* 4pt1), 1267-1283. https://doi.org/10.1017/S0954579414001394

Monahan, K. C., VanDerhei, S., Bechtold, J., & Cauffman, E. (2014). From the school yard to the squad car: School discipline, truancy, and arrest. *Journal of Youth and Adolescence, 43,* 1110-1122. https://doi.org/10.1007/s10964-014-0103-1

Mrug, S., & Windle, M. (2010). Prospective effects of violence exposure across multiple contexts on early adolescents' internalizing and externalizing problems. *Journal of Child Psychology and Psychiatry, and Allied Disciplines, 51*(8), 953–961. https://doi.org/10.1111/j.1469-7610.2010.02222.x

Murray, D. W., Rosanbalm, K., Christopoulos, C., & Hamoudi, A. (2015). *Self-regulation and toxic stress: Foundations for understanding self-regulation from an applied developmental perspective* (OPRE Report # 2015-21). Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. https://www.acf.hhs.gov/sites/default/files/opre/report_1_foundations_paper_final_012715_submitted_508.pdf

Murray, D. W., Rosanbalm, K., & Christopoulos, C. (2016). *Self-regulation and toxic stress report 3: A comprehensive review of self-regulation interventions from birth through young adulthood* (OPRE Report # 2016-34). Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services. https://www.acf.hhs.gov/sites/default/files/opre/acf_report_3_approved_fromword_b508.pdf

Murray, D. W., Rosanbalm, K., Christopoulos, C., & Meyer, A. L. (2019). An applied contextual model for promoting self-regulation enactment across development: Implications for prevention, public health and future research. *The Journal of Primary Prevention*, *40*, 367-403. https://doi.org/10.1007/s10935-019-00556-1

Muthén, L. K., & Muthén, B.O. (2012). *Mplus: Statistical analysis with latent variables-user's guide* (7th ed.). Muthén & Muthén.

Najman, J. M., Clavarino, A., McGee, T. R., Bor, W., Williams, G. M., & Hayatbakhsh, M. R. (2010). Timing and chronicity of family poverty and development of unhealthy behaviors in children: A longitudinal study. *Journal of Adolescent Health*, *46*, 538-544. https://doi.org/10.1016/j.jadohealth.2009.12.001

Najman, J. M., Hayatbakhsh, M. R., Clavarino, A., Bor, W., O'Callaghan, M. J., & Williams, G. M. (2010). Family poverty over the early life course and recurrent adolescent and young adult anxiety and depression: A longitudinal study. *American Journal of Public Health*, *100*(9), 1719-1723. https://doi.org/10.2105/AJPH.2009.180943

National Institutes of Health (1998). *Clinical guidelines on the identification, evaluation, and treatment of overweight and obesity in adults: The evidence report* (NIH Publication No. 98-4083). https://www.ncbi.nlm.nih.gov/books/NBK2003/

Nolen-Hoeksema, S., & Watkins, E. R. (2011). A heuristic for developing transdiagnostic models of psychopathology: Explaining multifinality and divergent trajectories. *Perspectives on Psychological Science*, *6*(6), 589-609. https://doi.org/10.1177/1745691611419672

Nelson, J., Klumparendt, A., Doebler, P., & Ehring, T. (2017). Childhood maltreatment and characteristics of adult depression: Meta-analysis. *The British Journal of Psychiatry*, *210*, 96-104. https://doi.org/10.1192/bjp.bp.115.180752

Neuman, L.W. (1999). *Social research methods: Qualitative and quantitative approaches* (4th ed.). Allyn and Bacon

Nigg, J. T. (2017). Annual research review: On the relations among self-regulation, self-control, executive functioning, effortful control, cognitive control, impulsivity, risk-taking, and inhibition for developmental psychopathology. *Journal of Child Psychology and Psychiatry*, *58*(4), 361-383. https://doi.org/10.1111/jcpp.12675

Nikulina, V., Widom, C. S., & Czaja, S. (2011). The role of childhood neglect and childhood poverty in predicting mental health, academic achievement and crime in adulthood. *American Journal of Community Psychology, 48,* 309-321. https://doi.org/10.1007/s10464-010-9385-y

Norman, R. E., Byambaa, M., De, R., Butchart, A., Scott, J., & Vos, T. (2012). The long-term health consequences of child physical abuse, emotional abuse, and neglect: A systematic review and meta-analysis. *PLoS Medicine, 9*(11), Article e1001349. https://doi.org/10.1371/journal.pmed.1001349

Oudekerk, B.A., & Truman, J.L. (2017). *Repeat violent victimization, 2005-14* (Special Report NCJ 250567). www.bjs.gov/content/pub/pdf/rvv0514.pdf

Parsons, T. J., Power, C., Logan, S., & Summerbelt, C. D. (1999). Childhood predictors of adult obesity: A systematic review. *International Journal of Obesity*, *23*, 1-107.

Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barratt impulsiveness scale. *Journal of Clinical Psychology*, *51*(6), 768-774.

Peach, H. D., & Gaultney, J. F. (2013). Sleep, impulse control, and sensation-seeking predict delinquent behavior in adolescents, emerging adults, and adults. *Journal of Adolescent Health, 53*(2), 293-299. https://doi.org/10.1016/j.jadohealth.2013.03.012

Perry, B.D. (2001). The neurodevelopmental impact of violence in childhood. In D. H. Schetky & E.P. Benedek (Eds.), *Child and Adolescent Forensic Psychiatry* (pp. 221-238). American Psychiatric Press.

Perry, B.D. (2006). Applying principles of neurodevelopment to clinical work with maltreated and traumatized children: The neurosequential model of therapeutics. In N. B. Webb (Ed.), *Working with Traumatized Youth in Child Welfare* (pp. 27-52). Guilford Press.

Persons, R. W. (2009). Art therapy with serious juvenile offenders: A phenomenological analysis. *International Journal of Offender Therapy and Comparative Criminology*, *53,* 433–453. https://doi.org/10.1177/0306624X08320208

Peters, R. H., Kremling, J., Bekman, N. M., & Caudy, M. S. (2012). Co-occurring disorders in treatment-based courts: Results of a national survey. *Behavioral Sciences & the Law, 30*(6), 800–820. https://doi.org/10.1002/bsl.2024

Piquero, A. R., Jennings, W. G., & Farrington, D. P. (2010). Self-control interventions for children under age 10 for improving self-control and delinquency and problem behaviors. *Campbell Systematic Reviews*. https://doi.org/10.4073/csr.2010.2

Posner, M. I., Rothbart, M. K., & Tang, Y. (2013). Developing self-regulation in early childhood. *Trends in Neuroscience and Education, 2*, 107-110. http://dx.doi.org/10.1016/j.tine.2013.09.001

Posner, M. I., Rothbart, M. K., Sheese, B. E., & Tang, Y. (2007). The anterior cingulate gyrus and the mechanism of self-regulation. *Cognitive, Affective, & Behavioral Neuroscience, 7*, 391–395. https://doi.org/10.3758/CABN.7.4.391

Pratt, T.C., & Cullen, F.T. (2000). The empirical status of Gottfredson and Hirschi's general theory of crime: A meta-analysis. *Criminology, 38* (3), 931–964.

Putnam, K. T., Harris, W. W., & Putnam, F. W. (2013). Synergistic childhood adversities and complex adult psychopathology. *Journal of Traumatic Stress, 26*(4), 435-442. https://doi.org/10.1002/jts.21833

Puzzanchera, C., & Hockenberry, S. (2019). *Characteristics of delinquency cases handled in juvenile court in 2017*. Office of Juvenile Justice and Delinquency Prevention. https://www.ojjdp.gov/ojstatbb/snapshots/DataSnapshot_JCS2017.pdf

Radloff, L. S. (1977). The CES-D scale a self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*(3), 385-401.

Raphael, D. (2011). Poverty in childhood and adverse health outcomes in adulthood. *Maturitas, 69*, 22-26. https://doi.org/10.1016/j.maturitas.2011.02.011

Ratchford, M., & Beaver, K. M. (2009). Neuropsychological deficits, low self-control, and delinquent involvement toward a biosocial explanation of delinquency. *Criminal Justice and Behavior, 36*, 147−162. https://doi.org/10.1177/0093854808325967

Ratcliffe, C., & McKernan, S.-M. (2010). *Childhood poverty persistence: Facts and Consequences* (Brief 14). The Urban Institute. https://www.urban.org/sites/default/files/publication/32926/412126-childhood-poverty-persistence-facts-and-consequences.pdf

Reavis, J. A., Looman, J., Franco, K. A., & Rojas, B. (2013). Adverse childhood experiences and adult criminality: How long must we live before we possess our own lives?. *The Permanente Journal*, *17*(2), 44-48. https://dx.doi.org/10.7812/TPP/12-072

Rhoden, M. A., Macgowan, M. J., & Huang, H. (2019). A systematic review of psychological trauma interventions for juvenile offenders. *Research on Social Work Practice*, *29*(8), 892-909. https://doi.org/10.1177/1049731518806578

Rocque, M., Posick, C., & Hoyle, J. (2016). Age and crime. In W.G. Jennings (Ed.*), The encyclopedia of crime and punishment* (1st ed., pp. 1-8). John Wiley & Sons, Inc. https://doi.org/10.1002/9781118519639.wbecpx275

Ruiz, M. A., Douglas, K. S., Edens, J. F., Nikolova, N. L., & Lilienfeld, S. O. (2012). Co-occurring mental health and substance use problems in offenders: Implications for risk assessment. *Psychological Assessment*, *24*(1), 77-87. https://doi.org/10.1037/a0024623

Sacks, V., Murphey, D., & Moore, K. (2014). *Adverse childhood experiences: National and state-level prevalence* (Publication #2014-28). Child Trend. http://www.childtrends.org/wp-content/uploads/2014/07/Brief-adverse-childhood-experiences_FINAL.pdf

Salas-Vallina, A., & Alegre, J. (2018). *Happiness at work: Developing a shorter measure. Journal of Management & Organization*, 1-21. https://doi.org/10.1017/jmo.2018.24

Sampson, R. J., & Laub, J. H. (2005). A life-course view of the development of crime. *The Annals of the American Academy of Political and Social Science, 602*(1), 12-45. https://doi/10.1177/0002716205280075

Santiago, A.M., & Galster, G.C. (2014). The effects of childhood exposure to neighborhood and community violence: Impacts on the safety and wellbeing of low-income, minority children. *Journal of Community Practice, 22*, 29-46. https://doi.org/10.1080/10705422.2014.901271

Savalei, V., & Bentler, P.M. (2005). A statistically justified pairwise ML method for incomplete nonnormal data: A comparison with direct ML and pairwise ADF. *Structural Equation Modeling*, *12*(2), 183-214. https://doi.org/10.1207/s15328007sem1202_1

Sbarra, D. A., & Hazan, C. (2008). Coregulation, dysregulation, self-regulation: An integrative analysis and empirical agenda for understanding adult attachment, separation, loss, and recovery. *Personality and Social Psychology Review*, *12*(2), 141–167. https ://doi.org/10.1177/10888 68308 31570 2.

Scannapieco, M., & Connell-Carrick, K. (2005). *Understanding child maltreatment: An ecological and developmental perspective*. Oxford University Press

Schickedanz, A., Dreyer, B. P., & Halfon, N. (2015). Childhood poverty: understanding and preventing the adverse impacts of a most-prevalent risk to pediatric health and well-being. *Pediatric Clinics*, *62*(5), 1111-1135. http://dx.doi.org/10.1016/j.pcl.2015.05.008

Schubert, C.A., & Mulvey, B.P. (2014). *Behavioral Health Problems, Treatment, and Outcomes in Serious Youthful Offenders* (NCJ 242440). Office of Juvenile Justice and Delinquency Prevention. https://ojjdp.ojp.gov/sites/g/files/xyckuh176/files/pubs/242440.pdf

Schubert, C. A., Mulvey, E. P., & Glasheen, C. (2011). Influence of mental health and substance use problems and criminogenic risk on outcomes in serious juvenile offenders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 50(9), 925-937. https://doi.org/10.1016/j.jaac.2011.06.006

Schuck, A. M., & Widom, C. S. (2005). *Understanding the role of neighborhood context in the long-term criminal consequences of child maltreatment*. American Journal of Community Psychology, 36(3-4), 207-222. https://doi.org/10.1007/s10464-005-8615-1

Shannon, B. J., Raichle, M. E., Snyder, A. Z., Fair, D. A., Mills, K. L., Zhang, D., Bache, K., Calhounc, C.D., Nigg, J.T., Nagel, B.J., Stevens, A.A., & Kiehlc, K.A., (2011). Premotor functional connectivity predicts impulsivity in juvenile offenders. *Proceedings of the National Academy of Sciences*, *108*(27), 11241-11245. https://doi.org/10.1073/pnas.1108241108

Shaw, D. S., Sitnick, S. L., Brennan, L. M., Choe, D. E., Dishion, T. J., Wilson, M. N., & Gardner, F. (2015). The long-term effectiveness of the Family Check-Up on school-age conduct problems: Moderation by neighborhood deprivation. *Development and Psychopathology*, *28*, 1471-1486. https://doi/org/10.1017/S0954579415001212

Shonkoff, J. P., Garner, A. S., Siegel, B. S., Dobbins, M. I., Earls, M. F., Garner, A.S., McGuinn, L., Pascoe, J., & Wood, D. L. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics, 129*(1), e232-e246. https://doi.org/10.1542/peds.2011-2663

Shook, J., Goodkind, S., Pohlig, R. T., Schelbe, L., Herring, D., & Kim, K. H. (2011). Patterns of mental health, substance abuse, and justice system involvement among youth aging out of child welfare. *American Journal of Orthopsychiatry*, *81*(3), 420-432. https://doi.org/10.1111/j.1939-0025.2011.01110.x

Shuey, K. M., & Willson, A. E. (2014). Economic hardship in childhood and adult health trajectories: An alternative approach to investigating life-course processes. *Advances in Life Course Research*, *22*, 49-61. http://dx.doi.org/10.1016/j.alcr.2014.05.001

Shufelt, J.L., & Cocozza, J.J. (2006). *Youth with mental health disorders in the juvenile justice system: Results from a multi-state prevalence study.* https://www.unicef.org/tdad/usmentalhealthprevalence06(3).pdf

Shulman, E. P., Steinberg, L. D., & Piquero, A. R. (2013). The age–crime curve in adolescence and early adulthood is not due to age differences in economic status. *Journal of Youth and Adolescence*, *42*, 848-860. https://doi 10.1007/s10964-013-9950-4

Sickmund, M., & Puzzanchera, C. (Eds.). (2014). *Juvenile Offenders and Victims: 2014 National Report*. National Center for Juvenile Justice.http://www.ojjdp.gov/ojstatbb/nr2014/downloads/NR2014.pdf

Sickmund, M., Sladky, A., and Kang, W. (2019). *Easy access to juvenile court statistics: 1985-2017*. https://www.ojjdp.gov/ojstatbb/ezajcs/

Siddarth, D. (2013). Risk factors for obesity in children and adults. *Journal of Investigative Medicine*, *61*(6), 1039-1042. http://dx.doi.org/10.2310/JIM.0b013e31829c39d0

Skogan, W.G., Hartnett, S.M., Natalie Bump, N., & Dubois, J. (2009). *Evaluation of ceasefire Chicago*. https://1vp6u534z5kr2qmr0w11t7ub-wpengine.netdna-ssl.com/wp-content/uploads/2019/09/Skogan-2009-Eval.pdf

Sloan, E., Hall, K., Moulding, R., Bryce, S., Mildred, H., & Staiger, P. K. (2017). Emotion regulation as a transdiagnostic treatment construct across anxiety, depression, substance, eating and borderline personality disorders: A systematic review. *Clinical Psychology Review*, *57*, 141-163. https://doi.org/10.1016/j.cpr.2017.09.002

Smith, C., & Thornberry. T.P. (1995). The Relationship between Childhood Maltreatment and Adolescent Involvement in Delinquency. *Criminology*, *33*(4). 451-481. https://doi.org/10.1111/j.1745-9125.1995.tb01186.x

Smith, D. K., Chamberlain, P., & Deblinger, E. (2012). Adapting multidimensional treatment foster care for the treatment of cooccurring trauma and delinquency in adolescent girls. *Journal of Child & Adolescent Trauma*, *5*, 224–238. https://doi.org/10.1080/19361521.2012.697101

Stadler, C., Sterzer, P., Schmeck, K., Krebs, A., Kleinschmidt, A., & Poustka, F. (2007). Reduced anterior cingulate activation in aggressive children and adolescents during affective stimulation: Association with temperament traits. *Journal of Psychiatric Research, 41*(5), 410–417. https://doi.org/10.1016/j.jpsychires.2006.01.006

Steinberg, L. (2008). A social neuroscience perspective on adolescent risk-taking. *Developmental Review, 28*(1), 78-106. https://doi: 10.1016/j.dr.2007.08.002

Stevens, F. L., Hurley, R. A., & Taber, K. H. (2011). Anterior cingulate cortex: unique role in cognition and emotion. *The Journal of Neuropsychiatry and Clinical Neurosciences, 23*(2), 121-125.

Stott, T. (2012). Placement instability and risky behaviors of youth aging out of foster care. *Child and Adolescent Social Work Journal, 29*, 61-83. https://doi.org /10.1007/s10560-011-0247-8

Tabachnick, B.G., & Fidell, L.S. (2013). *Using multivariate statistics* (6th ed.). Pearson.

Tangney, J.P., Baumeister, R.F., Boone, A.L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*(2), 271-324. https://doi.org/10.1111/j.0022-3506.2004.00263.x

Teplin, L. A., Abram, K. M., McClelland, G. M., Dulcan, M. K., & Mericle, A. A. (2002). Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry*, 59(12), 1133-1143. https://doi.org/10.1001/archpsyc.59.12.1133

Teplin, L.A., Abram, K.M., Washburn, J.J., Welty, L. J., Hershfield, J.A., & Dulcan, M. K. (2013*). The Northwestern Juvenile Project: Overview* (NCJ 234522). Office of Juvenile Justice and Delinquency Prevention. https://ojjdp.ojp.gov/sites/g/files/xyckuh176/files/pubs/234522.pdf

Thornberry, T. P., Henry, K. L., Ireland, T. O., & Smith, C. A. (2010). The causal impact of childhood-limited maltreatment and adolescent maltreatment on early adult adjustment. *Journal of Adolescent Health, 46*(4), 359-365. https://doi.org/10.1016/j.jadohealth.2009.09.011

Tourangeau, R., & Shin, H.-C. (1999). *National Longitudinal Study of Adolescent Health grand sample weight*. National Opinion Research Center. https://www.cpc.unc.edu/projects/addhealth/documentation/guides/weights.pdf

Tracy, M., Zimmerman, F. J., Galea, S., McCauley, E., & Stoep, A. V. (2008). What explains the relation between family poverty and childhood depressive symptoms?. *Journal of Psychiatric Research, 42*(14), 1163–1175. https://doi.org/10.1016/j.jpsychires.2008.01.011

Trickett, P. K., Negriff, S., Ji, J., & Peckins, M. (2011). Child maltreatment and adolescent development. *Journal of Research on Adolescence, 21*(1), 3-20. https://doi.org/10.1111/j.1532-7795.2010.00711.x

Tulloch, B. (2010). Guarding against manipulation by criminal offenders. Australasian Journal of Correctional Staff Development, 1-11

Turanovic, J. J. (2019). Heterogeneous effects of adolescent violent victimization on problematic outcomes in early adulthood. *Criminology, 57*(1), 105-135. https://doi.org/10.1111/1745-9125.12198

Turanovic, J. J., & Pratt, T. C. (2015). Longitudinal effects of violent victimization during adolescence on adverse outcomes in adulthood: A focus on prosocial attachments. *Journal of Pediatrics, 166*(4), 1062-1069. https://doi.org/10.1016/j.jpeds.2014.12.059

Turner, H. A., Shattuck, A., Finkelhor, D., & Hamby, S. (2016). *Polyvictimization and youth violence exposure across contexts*. Journal of Adolescent Health, 58, 208-214. http://dx.doi.org/10.1016/j.jadohealth.2015.09.021

Udry, J.R. (2001). *References, instruments, and questionnaires consulted in the development of the Add Health in-home adolescent interview*. https://www.cpc.unc.edu/projects/addhealth/documentation/guides/refer.pdf

U.S. Department of Health & Human Services. (1999*). Mental health: A report of the surgeon general*. U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health. https://www.hsdl.org/?view&did=730796

U.S. Department of Health & Human Services. (2019). *Child maltreatment 2017*. Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau. https://www.acf.hhs.gov/sites/default/files/cb/cm2017.pdf

Wade, R., Shea, J. A., Rubin, D., & Wood, J. (2014). Adverse childhood experiences of low-income urban youth. *Pediatrics, 134*, e13-e20. https://doi.org/10.1542/peds.2013-2475

Wadsworth, M. E. (2015). Development of maladaptive coping: A functional adaptation to chronic, uncontrollable stress. *Child Development Perspectives, 9*(2), 96-100. https://doi.org/10.1111/cdep.12112

Wagmiller R.L., Jr., & Adelman, (2009). *Childhood and intergenerational poverty: The long-term consequences of growing up poor*. National Center for Children in Poverty. http://www.nccp.org/publications/pub_909.html

Widom, C.S. (1989). Does Violence Beget Violence? A Critical Examination of the Literature, *Psychological Bulletin, 106*, 3-28.

Widom, C. S. (2017). Long-term impact of childhood abuse and neglect on crime and violence. *Clinical Psychology: Science and Practice*, *24*(2), 186-202. https://doi.org/10.1111/cpsp.12194

Widom, C. S., & Maxfield, M. G. (2001). *An update on the "Cycle of Violence"* (NCJ 184894). National Institute of Justice. https://www.ncjrs.gov/pdffiles1/nij/184894.pdf

Widom, C. S., & Shepard, R. L. (1996). Accuracy of adult recollections of childhood victimization: Part 1. Childhood physical abuse. *Psychological Assessment*, *8*(4), 412–421. https://doi.org/10.1037/1040-3590.8.4.412

Wilson, K. R., Hansen, D. J., & Li, M. (2011). The traumatic stress response in child maltreatment and resultant neuropsychological effects. *Aggression and Violent Behavior*, *16*(2), 87-97. https://doi.org/10.1016/j.avb.2010.12.007

Wolfe, S. E. & Hoffmann, J.P. (2016) On the measurement of low self-control in Add Health and NLSY79, Psychology, *Crime & Law*, *22*(7), 619-650. https://doi.org/10.1080/1068316X.2016.1168428

Wood, D., Crapnell, T., Lau, L., Bennett, A., Lotstein, D., Ferris, M., & Kuo, A. (2018). Emerging adulthood as a critical stage in the life course. In N. Halfon, C. B. Forrest, R. M. Lerner, & E. M. Faustman (Eds.), *Handbook of life course health development* (pp. 123-143). Springer. https://doi.org/10.1007/978-3-319-47143-3_7

Worthington, R., & Whittaker, T. (2006). Scale development research: A content analysis and recommendations for best practices. *Counseling Psychologist*, 34, 806-838. https://doi.org/10.1177/0011000006288127

Yaribeygi, H., Panahi, Y., Sahraei, H., Johnston, T. P., & Sahebkar, A. (2017). The impact of stress on body function: A review. EXCLI Journal, 16, 1057-1072. http://dx.doi.org/10.17179/excli2017-480

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, *9*(2), 79-94. https://doi.org/10.20982/tqmp.09.2.p079

Zastrow, C. and Kirst-Ashman, K. (2016). *Understanding human behavior and the social environment* (10th ed.). Cengage Learning

Ziol-Guest, K. M., Duncan, G. J., & Kalil, A. (2009). Early childhood poverty and adult body mass index. *American Journal of Public Health*, *99*(3), 527-532. https://doi.org/10.2105/AJPH.2007.130575

Table 1

Characteristics of Study Sample (N= 1,792)

Demographics	*N* (%)
Biological Sex	
Male	880 (49.1)
Race/Ethnicity	
Hispanic	210 (11.7)
Caucasian, Non-Hispanic	1120 (62.6)
African American, Non-Hispanic	376 (21)
Other, Non-Hispanic	82 (4.5)
Age	Mean (*SD*)
Wave I	14.48 (1.24)
Wave II	15.38 (1.21)
Wave III	20.85 (1.27)
Wave IV	27.36 (1.26)
Delinquency and Arrest History	*N* (%)
Delinquency only	1599 (89.2)
Juvenile arrest only	26 (1.5)
Both delinquency and juvenile arrest	167 (9.3)
Age of first juvenile arrest- Mean *(SD)*	15.63 (1.59)
Type of Delinquent Behaviors (5 most common):	
Wave I:	
Damage property	534 (29.9)
Steal from a store	604 (33.8)
Get into a serious physical fight	870 (48.6)
Steal something worth less than $50	509 (28.5)
Take part in a group fight	535 (29.9)
Wave II:	
Damage property	418 (23.4)
Steal from store	526 (29.5)
Steal a car	214 (12)
Steal something worth less than $50	434 (24.3)
Take part in a group fight	502 (28.1)

Note. SD= standard deviation

Table 1 (continued)

Characteristics of Study Sample (N= 1,792)

Childhood Adversity Experiences	*N* (%)
CM ≥ 1	1259 (70.3)
VV ≥ 1	658 (36.7)
EH ≥ 1[a]	221 (13.7)
≥ 1 adverse incident	1450 (80.9)
>1 of the three types of adversities	604 (33.7)
# of adverse incidents, Mean (*SD*)	4.83 (4.75)
Adult Well-being Outcomes Wave IV (Min-Max Range)	Mean *(SD)*
Mental health problems:	
Depression (0-25)	5.44 (4.35)
Stress (0-15)	4.89 (2.95)
AOD use (0-18)	2.51 (3.18)
Obesity (0-4)[b]	1.33 (1.28)
Criminal behaviors (0-18)	.57 (1.57)
SR deficiency indicators (0-5):	
Like to take risks	3.52 (1.07)
Try new things for fun	2.71 (1.42)
Look for excitement	3.03 (1.37)
Get people to believe untruth	2.98 (1.42)
Do things based on feeling	3.49 (1.2)
Adult Well-being Outcomes Wave III (Min-Max Range)	Mean (SD)
Depression (0-22)	4.18 (3.79)
Stress (0-1)	.051 (.22)
AOD use (0-7)	1.23 (1.23)
Obesity (0-4)[b]	.87 (1.12)
Criminal behaviors (0-23)	1.23 (2.5)

Note. CM= child maltreatment; VV= violent victimization; EH= economic hardship; min-max= minimum to maximum range; AOD= alcohol and other drug; SR= self-regulation; SD= standard deviation.

[a] Reflects responses reported by caregivers

[b] Underweight not included in the analysis

Table 2

Responses of the 17-SR Deficiency Indicators, EFA (n = 926)

Indicators	SA (%)	A (%)	NAND (%)	D (%)	SD (%)
1. Avoid problems	7.8	23.8	19.4	38.2	10.9
2. Gut feeling decisions	8	28.7	15.8	37.4	10.1
3. Like yourself	31.3	50.3	11.1	6.6	.6
4. Doing things right	22.8	59	12.4	4.9	1
5. Like to take risks	14.6	47	17.9	17.9	2.6
6. Not much future thoughts	2.8	12.1	9.4	52	23.7
7. Not follow the crowd	22	58.3	11.8	6.9	1
	VS (%)	S (%)	NSNDS (%)	DS (%)	VDS(%)
8. Satisfied with life	34.5	48.1	12.5	4	.9
	Very true (%)	Pretty true (%)	Somewhat True (%)	A little true (%)	Not true (%)
9. Try new things for fun	14.2	16.1	24.8	15	29.9
10. Look for excitement	18	20.5	24	17.7	19.8
11. Get people to believe untruth	17.6	22.8	22.4	13.8	23.5
12. Do things based on feeling	23.9	27.3	28.9	11.9	7.9
13. Get so excited that I lose control	6.2	7.8	16.9	19.8	49.3
14. Like no strict rules and regulations	12	14.5	23.4	21.8	28.3
15. Follow my instincts	10.6	13.3	22.7	23.1	30.2
16. Stretch the truth	12.1	15.2	21.7	25.3	25.7
17. Change my interest a lot	9.9	10.9	22.1	25.1	32.1

Note. SR= self-regulation; EFA= exploratory factor analysis; SA- strongly agree; A = agree; NAND = neither agree nor disagree; D = disagree; SD = strongly disagree; VS = very satisfied; S = satisfied; NSND = neither satisfied nor dissatisfied; DS = dissatisfied; VDS = very dissatisfied.

Table 3

Intercorrelations between the 17-SR Deficiency Indicators, EFA (n=926)

Indicators	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Avoid problems	1																
2. Gut feeling decisions	.236**	1															
3. Like yourself	-.130**	-.024	1														
4. Doing things right	-.145**	-.074	.551**	1													
5. Like to take risks	-.009	.193**	.147**	.107**	1												
6. Not much future thoughts	.228**	.326**	-.003	-.148**	.173**	1											
7. Not follow the crowd	-.054	.015	.093**	.125**	.071*	-.051	1										
8. Satisfied with life	-.169**	-.081	.395**	.441**	.064*	-.106**	.007	1									
9. Try new things for fun	.026	.146**	.017	-.010	.336**	.159**	-.021	-.029	1								
10. Look for excitement	.085*	.154**	.068*	-.010	.358**	.141**	.017	-.039	.565**	1							
11. Get people to believe untruth	.024	.097**	.044	.008	.213**	.100**	.037	.005	.379**	.416**	1						
12. Do things based on feeling	.148**	.232**	-.012	-.037	.245**	.189**	.077*	-.098**	.429**	.508**	.459**	1					
13. Get so excited that I lose control	.199**	.251**	-.030	-.052	.242**	.249**	-.044	-.084*	.349**	.419**	.341**	.408**	1				
14. Like no strict rules and regulations	.121**	.172**	-.017	-.045	.194**	.210**	.012	-.096*	.372**	.441**	.357**	.431**	.452**	1			
15. Follow my instincts	.202**	.519**	.008	-.055	.272**	.295**	.022	-.084*	.348**	.363**	.285**	.457**	.461**	.476**	1		
16. Stretch the truth	.124**	.147**	-.007	-.041	.155**	.177**	-.049	-.036	.261**	.292**	.572**	.356**	.392**	.357**	.353**	1	
17. Change my interest a lot	.199**	.216**	-.072	-.109**	.208**	.202**	-.016	-.137**	.364**	.425**	.374**	.401**	.478**	.429**	.432**	.461**	1

Note. SR = self-regulation; EFA= exploratory factor analysis.

*$p \leq .05$. **$p \leq .01$.

Table 4

Fit Indices and Eigenvalues of the SR Deficiency Scale Factor Solutions, EFA (n = 926)

Number of indicators	Factor Solutions	χ^2	*df*	RMSEA	CFI	TLI	SRMR	Eigenvalues >1
13	2- Factor	311.323***	53	.073	.883	.827	.043	4.652
	3- Factor	137.513***	42	.050	.957	.919	.028	1.424
	4- Factor	95.400***	32	.046	.971	.930	.021	1.074
12	2- Factor	146.978***	43	.051	.947	.918	.034	4.345
	3- Factor	84.073***	33	.041	.974	.948	.025	1.413
9	2-Factor	51.067***	19	.043	.972	.947	.028	3.189
								1.404

Note. SR= self- regulation; EFA= exploratory factor analysis; χ^2 = chi-square goodness of fit statistic, *df* = degrees of freedom; RMSEA =root-mean square error of approximation; CFI = comparative fit index; TLI = Tucker Lewis Index; SRMR = standardized root mean square residual; eigenvalues > 1 = eigenvalues greater than 1.
*** $p \leq .001$

Table 5

Factor Loadings and Descriptive Statistics of the 2-Factor SR Deficiency Scale, EFA (n = 926)

	Factor 1	Factor 2			
Indicators	Sensation -Seeking	Lack of Forward-Thinking	Mean (*SD*)	Eigenvalues	h^2
1. Avoid problems	-.030	**.302**	2.780 (1.137)	3.189	.087
2. Gut feeling decisions	-.007	**.753**	2.876 (1.163)	1.404	.565
5. Like to take risks	**.435**	.122	3.549 (1.046)	.871	.236
6. Not much future thoughts	.054	**.384**	2.210 (1.001)	.848	.163
9. Try new things for fun	**.672**	.004	2.755 (1.411)	.674	.454
10. Look for excitement	**.783**	-.012	3.042 (1.362)	.637	.608
11. Get people to believe untruth	**.585**	-.007	2.989 (1.403)	.510	.339
12. Do things based on feeling	**.578**	.207	3.512 (1.172)	.445	.450
15. Follow my instincts	.313	**.570**	2.544 (1.318)	.422	.531

Factor Correlation	Factor 1	Factor 2
1	1.000	
2	.304*	1.000

Note. SR= self-regulation; EFA = exploratory factor analysis; h^2 = communalities; SD= Standard deviation.
* $p \leq .05$

Table 6

Bivariate Correlations and Descriptive Statistics of the 9-Indicator SR Deficiency Scale, CFA (n=866)

Indicators	1	2	5	6	9	10	11	12	15
1. Avoid problems	1								
2. Gut feeling decisions	.202	1							
5. Like to take risks	.018	.228	1						
6. Not much future thoughts	.191	.267	.200	1					
9. Try new things for fun	.046	.138	.359	.139	1				
10. Look for excitement	.013	.176	.353	.103	.604	1			
11. Get people to believe untruth	.010	.036	.244	.001	.425	.425	1		
12. Do things based on feeling	.027	.146	.293	.102	.414	.440	.440	1	
15. Follow my instincts	.163	.453	.281	.199	.354	.368	.312	.409	1
Mean	2.885	2.967	3.565	2.342	2.803	3.118	2.976	3.474	2.638
SD	1.134	1.121	1.089	1.092	1.401	1.328	1.406	1.196	1.361
Skewness	.207	.165	-.551	.830	.098	-.126	-.079	-.408	.358
Kurtosis	-.997	-1.051	-.604	-.111	-1.244	-1.093	-1.292	-.634	-1.060

Note. SR= self-regulation; CFA= confirmatory factor analysis; SD= standard deviation.

Table 7

Model Fit Indices of the 2-Factor SR Deficiency Scale, CFA (n = 866)

	χ^2	*df*	CFI	TLI	RMSEA	SRMR
Model without correlated errors	102.986***	26	.914	.880	.058	.052
Model with correlated errors	72.874***	24	.945	.918	.048	.047

Note. SR= self-regulation; CFA = confirmatory factor analysis; χ^2 = chi-square test; *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root-mean square error of approximation; SRMR = standardized root mean square residual.
*** $p \leq .001$

Table 8

Parameter and Standard Error Estimates, CFA (n=866)

Parameter Estimates	B (SE)	β (SE)	*p*
Sensation-Seeking:			
Like to take risks	1 (0)	.478 (.038)	.001
Try new things for fun	1.778 (.165)	.661(.036)	.001
Look for excitement	1.733 (.150)	.679 (.044)	.001
Get people to believe untruth	1.666 (.191)	.616 (.032)	.001
Do things based on feeling	1.539 (.168)	.669 (.035)	.001
Lack of Forward-Thinking:			
Avoid problems	1 (0)	.168 (.061)	.01
Gut feeling decisions	2.709 (.874)	.460 (.060)	.001
Not much thoughts for future	1.168 (.452)	.203 (.066)	.01
Follow my instincts	7.067 (2.959)	.986 (.083)	.001
Lack of Forward-thinking *with* Sensation-Seeking	.056 (.024)	.565 (.043)	.001
Try new things for fun *with* Look for excitement	.289 (.075)	.282 (.060)	.001
Gut feeling decisions *with* Not much thoughts for future	.212 (.073)	.200 (.060)	.001
Residual Variances	B (SE)	β (SE)	*p*
Like to take risks	.916 (.056)	.772 (.037)	.001
Try new things for fun	1.107 (.082)	.564 (.047)	.001
Look for excitement	.950 (.099)	.539 (.059)	.001
Get people to believe untruth	1.231 (.082)	.621(.040)	.001
Do things based on feeling	.791 (.072)	.552 (.047)	.001
Avoid problems	1.251 (.051)	.972 (.020)	.001
Gut feeling decisions	.990 (.075)	.789 (.055)	.001
Not much thoughts for future	1.143 (.073)	.959 (.027)	.001
Follow my instincts	.051 (.305)	.028 (.164)	.867
Variable Intercepts	B (SE)	β (SE)	*p*
Like to take risks	3.565 (.044)	3.272 (.112)	.001
Try new things for fun	2.810 (.057)	2.005 (.049)	.001
Look for excitement	3.121 (.050)	2.349 (.064)	.001
Get people to believe untruth	2.979 (.066)	2.116 (.062)	.001
Do things based on feeling	3.476 (.050)	2.905 (.092)	.001
Avoid problems	2.885 (.063)	2.543 (.054)	.001
Gut feeling decisions	2.967 (.039)	2.648 (.054)	.001
Not much thoughts for future	2.342 (.055)	2.145 (.045)	.001
Follow my instincts	2.639 (.063)	1.937 (.039)	.001

Note. CFA= confirmatory factor analysis; $p \leq .01$, $p \leq .001$.

Table 8 continued

Parameter and Standard Error Estimates, CFA (n=866)

Variable Squares Multiple Correlation	R^2 Estimates
Like to take risks	.228
Try new things for fun	.436
Look for excitement	.461
Get people to believe untruth	.379
Do things based on feeling	.448
Avoid problems	.028
Gut feeling decisions	.211
Not much thoughts for future	.041
Follow my instincts	.972

Note. CFA= confirmatory factor analysis*;* B = unstandardized beta estimates; β = standardized beta estimates; SE= standard errors; R^2 = R-squared;

Table 9

Validity and Reliability Measures of the 2-Factor SR Deficiency Scale, CFA(n = 866)

Factors & Indicators	λ	AVE	CR
Sensation-Seeking:		.391	.760
Like to take risks	.478		
Try new things for fun	.661		
Look for excitement	.679		
Get people to believe untruth	.616		
Do things based on feeling	.669		
Lack of Forward-Thinking:		.313	.546
Avoid problems	.168		
Gut feeling decisions	.460		
Not much thoughts for future	.203		
Follow my instincts	.986		

Note. λ = standardized factor loadings; AVE = average variance extracted; CR = composite reliability.

Table 10

Bivariate Correlations and Descriptive Statistics of the Main Variables (N = 1,792)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. CM	1													
2. VV	.117**	1												
3. EH	.055*	.116**	1											
4. Depression	.197**	.078**	.159**	1										
5. Stress	.189**	.080**	.126**	.665**	1									
6. AOD use	.053*	.084**	.002	.037	.031	1								
7. Obesity	.006	.050*	.013	.036	.039	-.088**	1							
8. Criminal behaviors	.121**	.178**	.058*	.118**	.115**	.325**	-.001	1						
9. Like to take risks	-.016	.092**	0	-.069**	-.071**	.134**	-.020	.100**	1					
10. Try new things for fun	.089**	.045	-.039	0	-.010	.214**	.051*	.126**	.355**	1				
11. Look for excitement	.056*	.095**	-.043	-.006	-.014	.175**	-.032	.118**	.355**	.589**	1			
12. Get people to believe untruth	.054*	.066**	-.057*	-.039	-.045	.173**	-.043	.163**	.234**	.391**	.428**	1		
13. Do things based on feeling	.061*	.088**	-.002	.013	.015	.154**	-.020	.110**	.275**	.451**	.497**	.448**	1	
14. JA	.065**	.197**	.085**	-	-	-	-	-	.081**	.090**	.116**	.096**	.097**	1
Mean	3.606	1.044	.1953	5.436	4.893	2.515	1.333	.574	3.517	2.710	3.030	2.980	3.490	.108
SD	3.998	2.012	.524	4.348	2.950	3.181	1.281	1.569	1.068	1.415	1.367	1.418	1.203	.310
Skewness	1.464	2.879	2.638	1.147	.470	1.538	.704	4.702	-.494	.192	-.055	-.084	-.414	2.533
Kurtosis	2.417	10.174	5.731	1.422	-.127	2.033	-.560	30.322	-.619	-1.249	-1.188	-1.297	-.680	4.421

Note. CM = child maltreatment, VV = violent victimization, EH = economic hardship, AOD use = alcohol and other drugs use problems, JA = juvenile arrest.
* $p \leq .05$, ** $p \leq .01$.

Table 11

Missing Responses on the Predictor Variables (N =1792)

Predictor Variables	Missing	
	N	%
Child Maltreatment	0	0
Violent Victimization	0	0
Economic Hardship	174	9.7
Like to take risks	0	0
Try new things for fun	46	2.6
Look for excitement	41	2.3
Get people to believe untruth	52	2.9
Do things based on feeling	32	1.8
Juvenile Arrest	0	0

Table 12

Missing Values Analyses of Predictors on Demographic Variables (N=1,792)

		No Missing	Yes Missing		
				χ^2	*p*
Economic hardship:	Ethnicity			3.514	.061
	Hispanic, N (%)	182 (11.3)	28 (16.1)		
	Non-Hispanic, N (%)	1432 (88.7)	146 (83.9)		
	Biological Sex			2.779	.095
	Male, N (%)	805 (49.8)	75 (43.1)		
	Female, N (%)	813 (50.2)	99 (56.9)		
				t	*p*
	Age, M (*SD*)	14.445 (1.235)	14.845 (1.190)	-4.073	.001
				χ^2	*p*
Try new things for fun:	Ethnicity			1.148	.284
	Hispanic, N (%)	207 (11.9)	3 (6.7)		
	Non-Hispanic, N (%)	1536 (88.1)	42 (93.3)		
	Biological Sex			6.315	.05
	Male, N (%)	849 (48.6)	31 (67.4)		
	Female, N (%)	897 (51.4)	15 (32.6)		
				t	*p*
	Age, M (*SD*)	14.482 (1.237)	14.544 (1.206)	-.332	.740
				χ^2	*p*
Look for excitement:	Ethnicity				
	Hispanic, N (%)	207 (11.8)	3 (7.5)	.711	.399
	Non-Hispanic, N (%)	1541 (88.2)	37 (92.5)		
	Biological Sex				
	Male, N (%)	855 (48.8)	25 (61)	2.365	.124
	Female, N (%)	896 (51.2)	16 (39)		
				t	*p*
	Age, M (*SD*)	14.489 (1.238)	14.268 (1.119)	1.130	.259

$p \leq .05, p \leq .01, p \leq .001$

Table 12 continued

Missing Values Analyses of Predictors on Demographic Variables (N=1792)

		No Missing	Yes Missing		
				χ^2	*p*
Get people to believe untruth:	Ethnicity			.199	.656
	Hispanic, N (%)	203 (11.7)	7 (13.7)		
	Non-Hispanic, N (%)	1534 (88.3)	44 (86.3)		
	Biological Sex			.481	.488
	Male, N (%)	852 (49)	28 (53.8)		
	Female, N (%)	888 (51)	24 (46.2)		
				t	*p*
	Age, M (*SD*)	14.485 (1.238)	14.462 (1.163)	.132	.895
				χ^2	*p*
Do things based on feeling:	Ethnicity			.585	.444
	Hispanic, N (%)	205 (11.7)	5 (16.1)		
	Non-Hispanic, N (%)	1552 (88.3)	26 (83.9)		
	Biological Sex			.665	.415
	Male, N (%)	862 (49)	18 (56.3)		
	Female, N (%)	898 (51)	14 (43.8)		
				t	*p*
	Age, M (*SD*)	14.484 (1.238)	14.500 (1.107)	-.075	.940

$p \leq .05, p \leq .01, p \leq .001$

Table 13

Parameter Estimates of the Mediation Model (N=1,749)

	Parameter Estimates		
Measurement Model Estimates	*B* (SE)	β (SE)	*p*
SR by			
Like to take risks	1.000 (0)	.488 (.023)	.001
Try new things for fun	1.948 (.108)	.718 (.021)	.001
Look for excitement	1.990 (.103)	.768 (.018)	.001
Get people to believe untruth	1.607 (.109)	.595 (.025)	.001
Do things based on feeling	1.422 (.095)	.624 (.025)	.001
Mental health problems by			
Depression	1.643 (.082)	.873 (.023)	.001
Stress	1.000 (0)	.772 (.020)	.001
SR on			
CM	.012 (.004)	.089 (.027)	.001
VV	.014 (.008)	.047 (.027)	.079
EH	-.051 (.026)	-.048 (.025)	.056
Mental health problems on			
CM	.088 (.018)	.144 (.029)	.001
VV	.052 (.039)	.040 (.030)	.173
EH	.649 (.171)	.140 (.036)	.001
AOD use on			
CM	.016 (.024)	.018 (.028)	.505
VV	.128 (.053)	.070 (.029)	.05
EH	.289 (.187)	.044 (.029)	.127
Obesity on			
CM	.003 (.006)	.009 (.018)	.631
VV	-.024 (.014)	-.033 (.019)	.084
EH	-.107 (.049)	-.041 (.019)	.05
Criminal behaviors on			
CM	.040 (.013)	.096 (.029)	.001
VV	.075 (.026)	.087 (.030)	.01
EH	.206 (.125)	.066 (.041)	.108
Mental health problems on SR	-.219 (.143)	-.050 (.033)	.125
AOD use on SR	.348 (.207)	.056 (.033)	.088
Obesity on SR	-.001 (.059)	0 (.024)	.993
Criminal behaviors on SR	.141 (.086)	.048 (.029)	.101

Note. Chi square test χ^2 (118) = 225.238, Comparative Fit Index =.978; Tucker Lewis Index =.957; Root-Mean Square Error of Approximation =.023; Standardized Root Mean Square Residual =.015; *B* = unstandardized beta estimates, β = standardized beta estimates, SE = standard errors, SR = self-regulation deficiency scale; CM = child maltreatment, VV = violent victimization, EH= economic hardship, AOD= alcohol and other drugs use problems; $p \leq .05$, $p \leq .01$, $p \leq .001$.

Table 13 continued

Parameter Estimates of the Mediation Model (N=1,749)

Residual Variances	B (SE)	β (SE)	*p*
Like to take risks	.855 (.039)	.762 (.023)	.001
Try new things for fun	.952 (.061)	.484 (.030)	.001
Look for excitement	.738 (.052)	.411 (.028)	.001
Get people to believe untruth	1.262 (.063)	.646 (.029)	.001
Do things based on feeling	.848 (.043)	.611 (.031)	.001
Depression	4.305 (.745)	.238 (.041)	.001
Stress	3.473 (.269)	.404 (.032)	.001
AOD	7.755 (.449)	.746 (.023)	.001
Obesity	.611 (.029)	.381 (.022)	.001
SR	.207 (.020)	.773 (.023)	.001
Mental health problems	3.689 (.268)	.721 (.025)	.001
Criminal behaviors	2.016 (.259)	.866 (.020)	.001
Variable Intercepts	B (SE)	β (SE)	*p*
Like to take risks	3.897 (.206)	3.679 (.201)	.001
Try new things for fun	3.435 (.383)	2.449 (.272)	.001
Look for excitement	3.746 (.395)	2.795 (.290)	.001
Get people to believe untruth	3.524 (.325)	2.522 (.228)	.001
Do things based on feeling	3.959 (.293)	3.360 (.250)	.001
Depression	1.908 (1.070)	.448 (.253)	.076
Stress	2.752 (.638)	.939 (.218)	.001
AOD	4.320 (.979)	1.340 (.304)	.001
Obesity	.476 (.286)	.376 (.226)	.096
Criminal behaviors	.825 (.411)	.541 (.273)	.05

Note. Chi square test χ^2 (118) = 225.238, Comparative Fit Index =.978; Tucker Lewis Index =.957; Root Mean Square Error of Approximation =.023; Standardized Root Mean Square Residual = .015; B = unstandardized beta estimates, β = standardized beta estimates, SE = standard errors, SR = self-regulation deficiency; CM = child maltreatment; VV = violent victimization; EH= economic hardship, AOD use = alcohol and other drugs use problems; $p \leq .05$, $p \leq .01$, $p \leq .001$

Table 13 continued

Parameter Estimates of the Mediation model (N=1,749)

Variable Squares Multiple Correlation	R^2 Estimates		
Like to take risks	.238		
Try new things for fun	.516		
Look for excitement	.589		
Get people to believe untruth	.354		
Do things based on feeling	.389		
Depression	.762		
Stress	.596		
AOD	.254		
Obesity	.619		
Criminal behaviors	.134		
SR	.227		
Mental health problems	.279		
Structural Model Path Estimates	B (SE)	β (SE)	*p*
CM to Mental health problems (total)	.085 (.018)	.140 (.030)	.001
CM to Mental health problems	.088 (.018)	.144 (.029)	.001
CM to SR to Mental health problems	-.003 (.002)	-.004 (.003)	.189
CM to AOD (total)	.020 (.024)	.023 (.027)	.389
CM to AOD	.016 (.024)	.018 (.028)	.505
CM to SR to AOD	.004 (.003)	.005 (.003)	.122
CM to Obesity (total)	.003 (.006)	.009 (.019)	.640
CM to Obesity	.003 (.006)	.009 (.018)	.631
CM to SR to Obesity	0 (.001)	.000 (.002)	.993
CM to Criminal behaviors (total)	.041 (.013)	.100 (.029)	.001
CM to Criminal behaviors	.040 (.013)	.096 (.029)	.001
CM to SR to Criminal behaviors	.002 (.001)	.004 (.003)	.129
VV to Mental health problems (total)	.049 (.040)	.038 (.030)	.204
VV to Mental health problems	.052 (.039)	.040 (.030)	.173
VV to SR to Mental health problems	-.003 (.003)	-.002 (.002)	.264
VV to AOD (total)	.133 (.053)	.072 (.028)	.01
VV to AOD	.128 (.053)	.070 (.029)	.05
VV to SR to AOD	.005 (.004)	.003 (.002)	.205
VV to Obesity (total)	-.024 (.014)	-.033 (.019)	.084
VV to Obesity	-.024 (.014)	-.033 (.019)	.084
VV to SR to Obesity	0 (.001)	0 (.001)	.993
VV to Criminal behaviors (total)	.077 (.026)	.089 (.030)	.01
VV to Criminal behaviors	.075 (.026)	.087 (.030)	.01
VV to SR to Criminal behaviors	.002 (.002)	.002 (.002)	.242
EH to Mental health problems (total)	.661 (.173)	.143 (.037)	.001
EH to Mental health problems	.649 (.171)	.140 (.036)	.001
EH to SR to Mental health problems	.011 (.009)	.002 (.002)	.246
EH to AOD (total)	.271 (.188)	.041 (.029)	.154
EH to AOD	.289 (.187)	.044 (.029)	.127
EH to SR to AOD	-.018 (.013)	-.003 (.002)	.176
EH to Obesity (total)	-.107 (.049)	-.041 (.019)	.05
EH to Obesity	-.107 (.049	-.041 (.019)	.05
EH to SR to Obesity	0 (.003)	0 (.001)	.993
EH to Criminal behaviors (total)	.199 (.128)	.064 (.042)	.127
EH to Criminal behaviors	.206 (.125)	.066 (.041)	.108
EH to SR to Criminal behaviors	-.007 (.006)	-.002 (.002)	.213

Note. Chi square test χ^2 (118) = 225.238, Comparative Fit Index =.978; Tucker Lewis Index =.957; Root-Mean Square Error of Approximation =.023; Standardized Root Mean Square Residual = .015; *B* = unstandardized beta estimates, β = standardized beta estimates, SE = standard errors, SR = self-regulation deficiency scale; CM = child maltreatment, VV = violent victimization, EH= economic hardship, AOD= alcohol and other drugs use problems; $p \leq .05$, $p \leq .01$, $p \leq .001$.

Table 14

Parameter Estimates of the Moderation Model (N = 1,749)

	Parameter Estimates		
	B (SE)	β (SE)	p
SR by			
Like to take risks	1.000 (0)	.486 (.023)	.001
Try new things for fun	1.940 (.106)	.711 (.021)	.001
Look for excitement	2.032 (.107)	.780 (.018)	.001
Get people to believe untruth	1.612 (.106)	.594 (.024)	.001
Do things based on feeling	1.425 (.096)	.622 (.025)	.001
SR on			
CM	.016 (.004)	.115 (.028)	.001
VV	.021 (.009)	.071 (.030)	.05
EH	-.063 (.031)	-.060 (.031)	.051
JA	.166 (.053)	.100 (.032)	.01
CM x JA	0 (.012)	-.001 (.031)	.983
VV x JA	-.035 (.018)	-.060 (.033)	.068
EH x JA	-.068 (.087)	-.028 (.036)	.449
Residual Variances	*B* (SE)	β (SE)	p
SR	.225 (.021)	.849 (.023)	.001
Like to take risks	.858 (.039)	.756 (.022)	.001
Try new things for fun	.973 (.061)	.494 (.030)	.001
Look for excitement	.706 (.052)	.392 (.028)	.001
Get people to believe untruth	1.266 (.063)	.648 (.029)	.001
Do things based on feeling	.852 (.044)	.613 (.031)	.001
Variable Intercepts	*B* (SE)	β (SE)	p
Like to take risks	4.212 (.217)	3.976 (.214)	.001
Try new things for fun	4.046 (.391)	2.882 (.276)	.001
Look for excitement	4.402 (.419)	3.281 (.306)	.001
Get people to believe untruth	4.036 (.339)	2.886 (.238)	.001
Do things based on feeling	4.410 (.309)	3.740 (.260)	.001

Note. Chi square test χ^2 (55) = 153.797, Comparative Fit Index =.947, Tucker Lewis Index = .947, Root-Mean Square Error of Approximation = .032; Standardized Root Mean Square Residual= .032; *B* = unstandardized beta estimates; β = standardized beta estimates; SE = standard errors; SR = self-regulation deficiency; JA = juvenile arrest; CM = child maltreatment, VV = violent victimization, EH = economic hardship; x = product term of variables; $p \leq .05$, $p \leq .01$, $p \leq .001$.

Table 14 continued

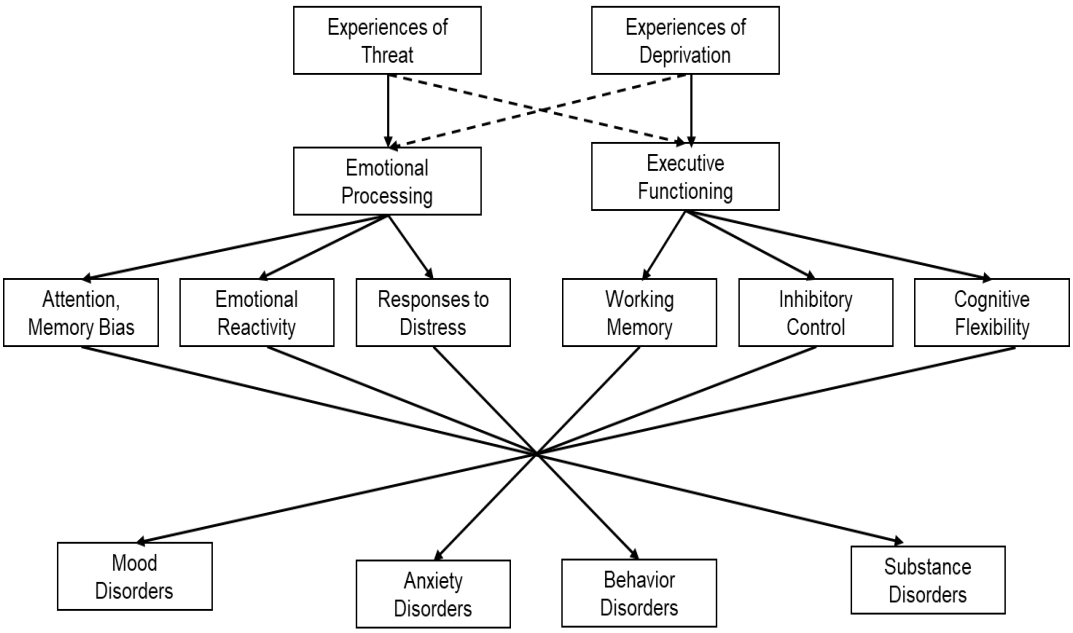
Parameter Estimates of the Moderation Model (N = 1,749)

Variable Squares Multiple Correlation:	R^2 Estimates
SR	.159 (.024)
Like to take risks	.236 (.022)
Try new things for fun	.506 (.030)
Look for excitement	.608 (.028)
Get people to believe untruth	.352 (.029)
Do things based on feeling	.387 (.031)

Note. Chi square test χ^2 (55) = 153.797, Comparative Fit Index =.947, Tucker Lewis Index = .947, Root-Mean Square Error of Approximation = .032; Standardized Root Mean Square Residual= .032.

Figure 1

Transdiagnostic Model



Note. Transdiagnostic model indicating the association between experiences of threat (such as child maltreatment and violent victimization) and deprivation (such as economic hardship) to multiple disorders through emotional processing and executive functioning. Lines indicate pathways or associations. Solid lines are more established and dashed lines are less well-established pathways. Adapted from "Future Directions in Childhood Adversity and Youth Psychopathology," by K.A. McLaughlin, 2016, *Journal of Clinical Child & Adolescent Psychology*, *45*(3), p.37 (https://doi.org/10.1080/15374416.2015.1110823). Copyright 2016 by Taylor & Francis Group, LLC. Reprinted with permission

Figure 2

Conceptual Mediation Framework for Current Study

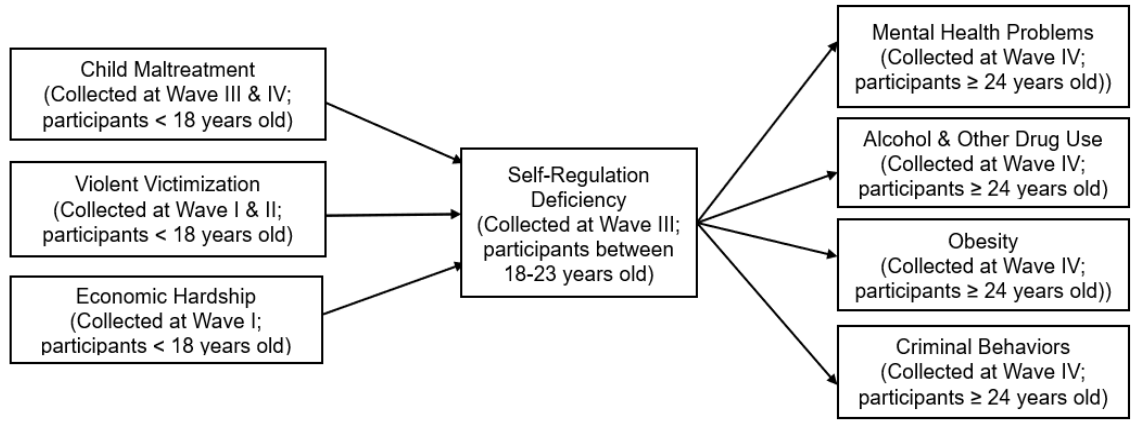


Figure 3

Conceptual Moderation Framework for Current Study

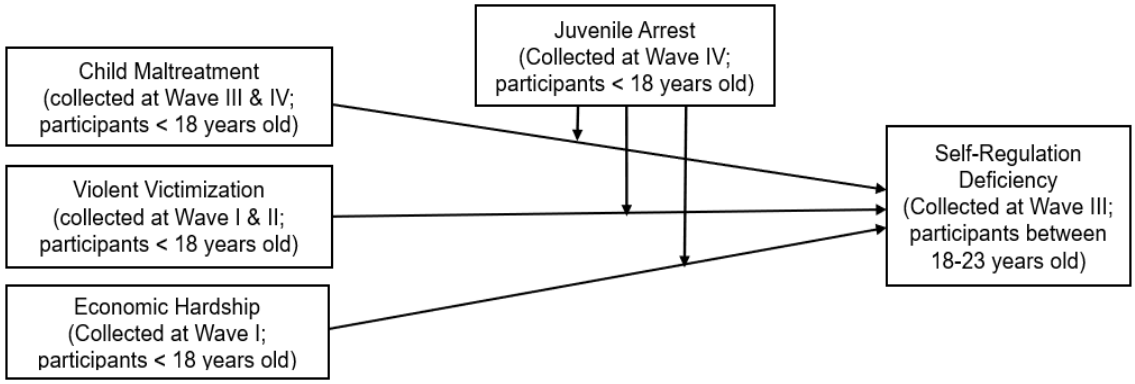
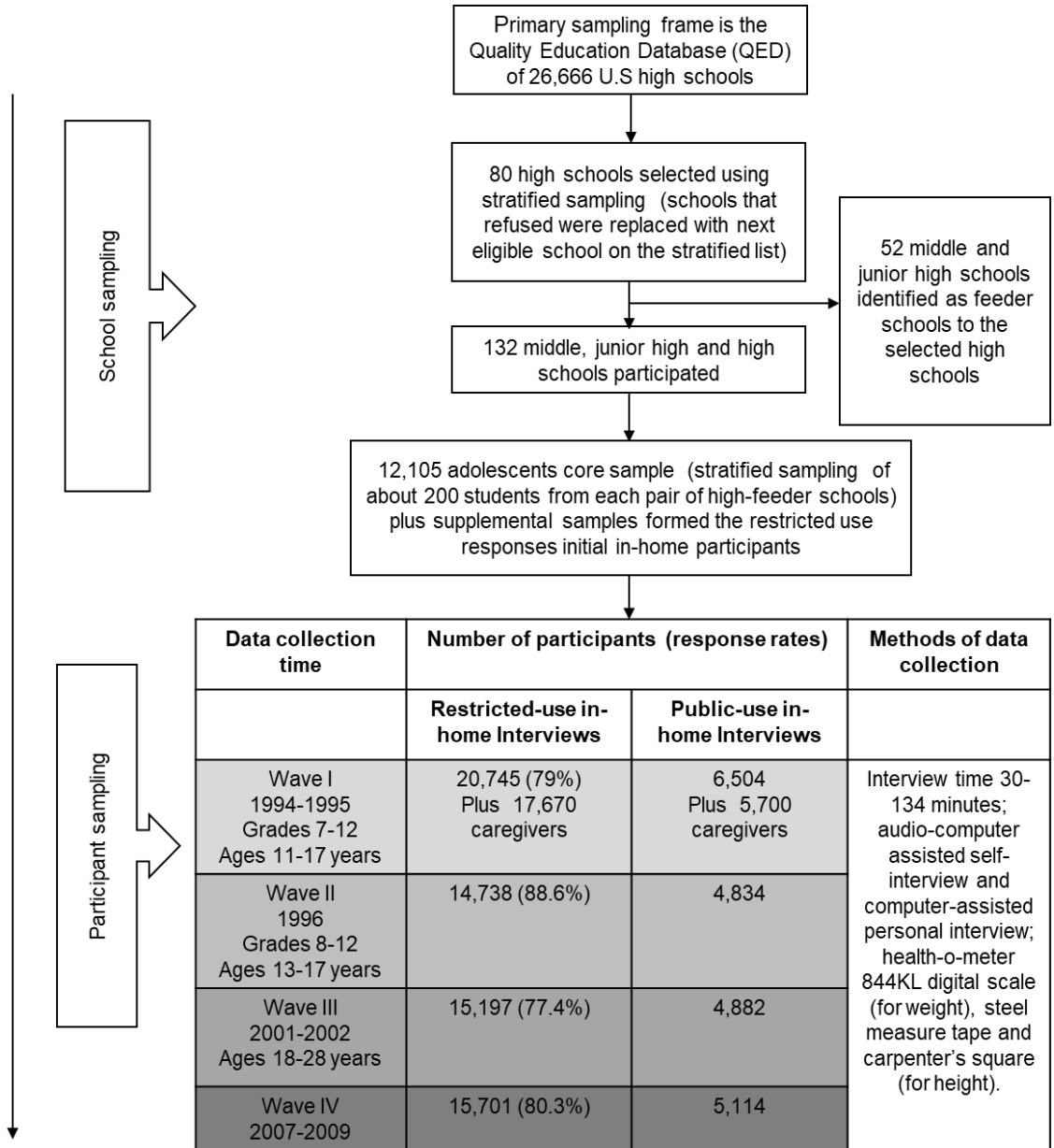


Figure 4

Add Health Research Design



Data collection time	Number of participants (response rates)		Methods of data collection
	Restricted-use in-home Interviews	Public-use in-home Interviews	
Wave I 1994-1995 Grades 7-12 Ages 11-17 years	20,745 (79%) Plus 17,670 caregivers	6,504 Plus 5,700 caregivers	Interview time 30-134 minutes; audio-computer assisted self-interview and computer-assisted personal interview; health-o-meter 844KL digital scale (for weight), steel measure tape and carpenter's square (for height).
Wave II 1996 Grades 8-12 Ages 13-17 years	14,738 (88.6%)	4,834	
Wave III 2001-2002 Ages 18-28 years	15,197 (77.4%)	4,882	
Wave IV 2007-2009 Ages 24-34 years	15,701 (80.3%)	5,114	

Figure 5

Flow Chart of Current Sample Selection

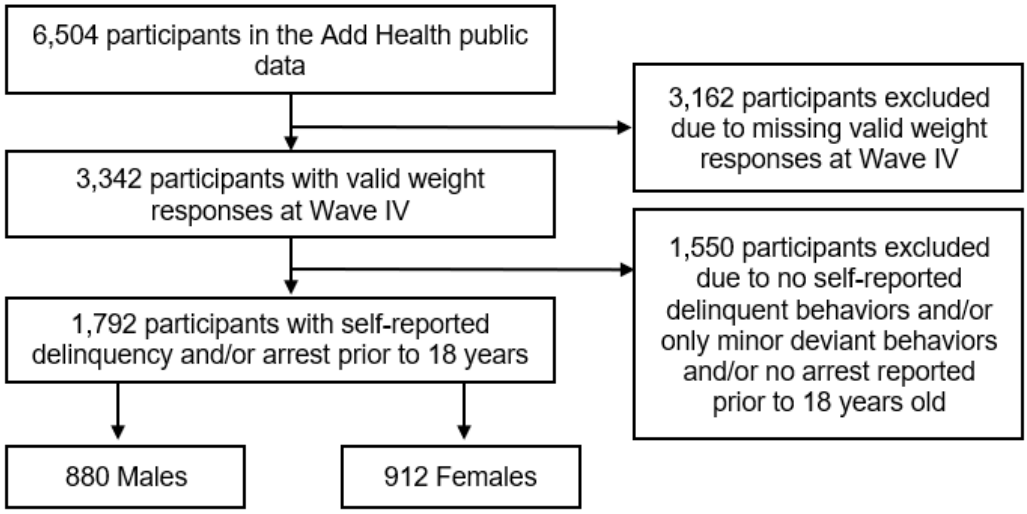
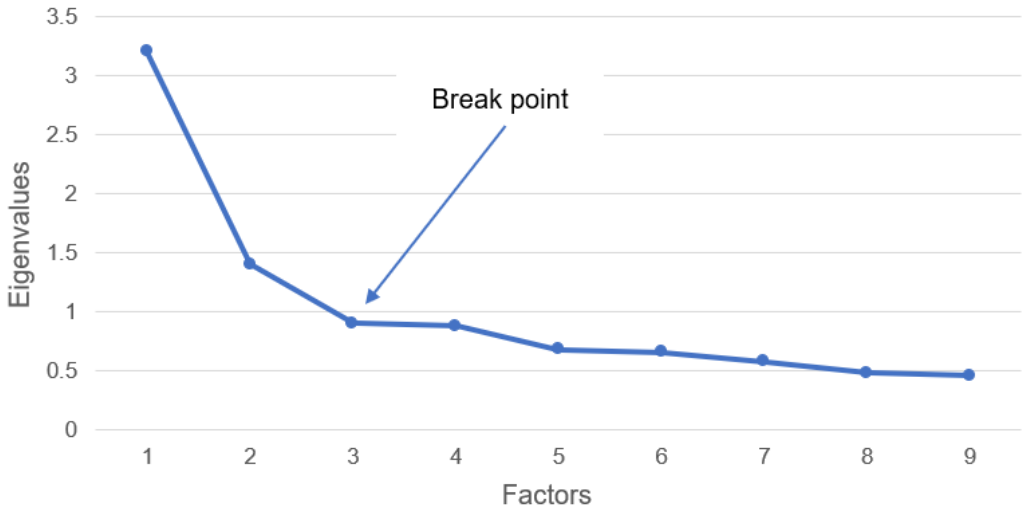


Figure 6

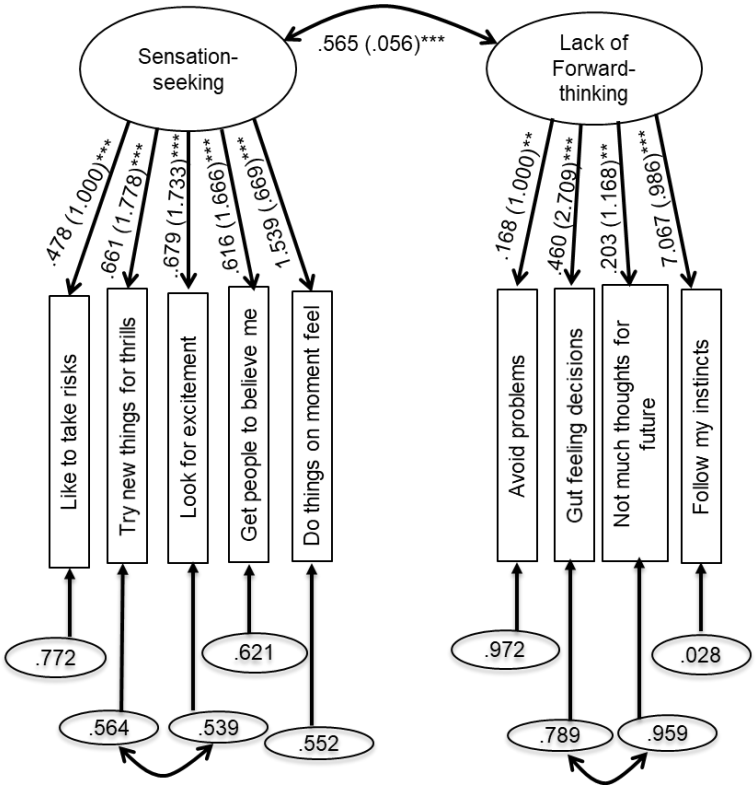
Scree Plot for SR Deficiency Scale, EFA (n=926)



Notes. SR= self-regulation; EFA= exploratory factor analysis.

Figure 7

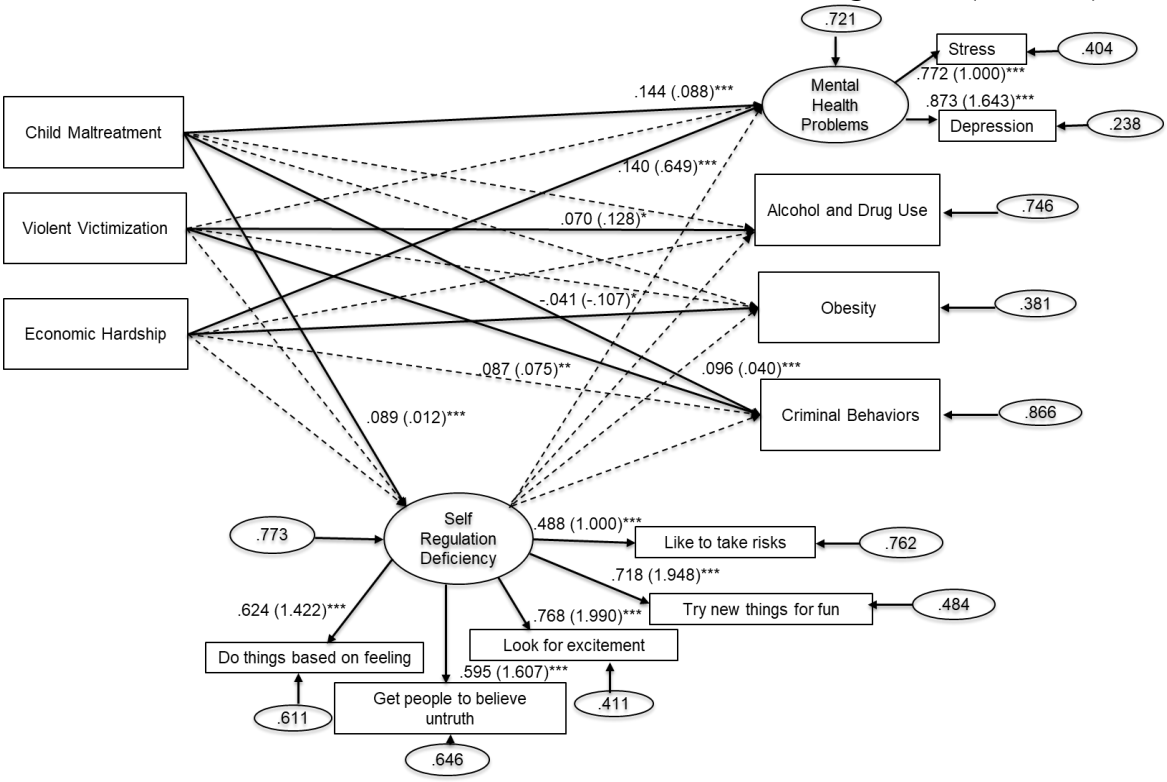
CFA Model of the 2-Factor SR Deficiency Scale (n= 866)



Note. **$p \leq .01$, ***$p \leq .001$

Figure 8

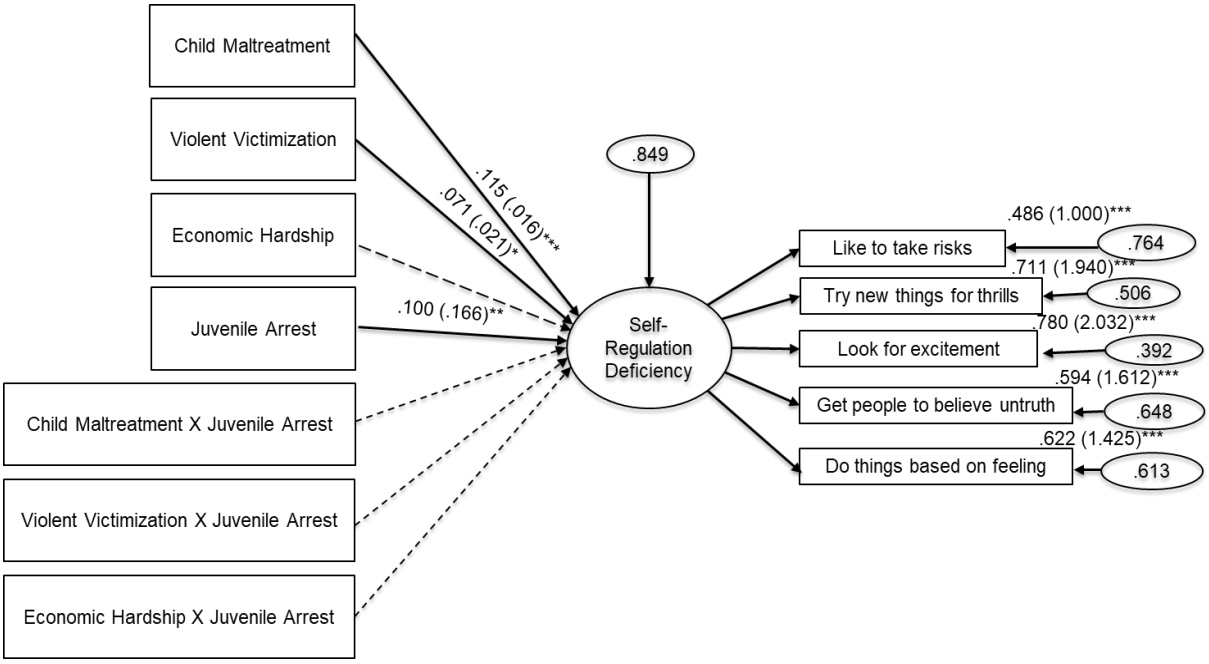
Final Mediation Model with Standardized and Unstandardized Regression (N=1,749)



Note. **p*≤.05, ***p*≤.01, ****p*≤.001

Figure 9

Final Moderation Model with Standardized and Unstandardized Regression (N=1,749)



Note. *$p \leq .05$, **$p \leq .01$, ***$p \leq .001$, x= product term

APPENDICES

Appendix A

Institutional Review Board Approval Letter for Current Study

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To:	Dr. Hui Huang
CC:	Michelle-Ann Rhoden
From:	Maria Melendez-Vargas, MIBA, IRB Coordinator
Date:	June 26, 2018
Protocol Title:	"THE EFFECTS OF CHILDHOOD ADVERSITY, YOUTH ARREST AND SELF-REGULATION ON YOUNG ADULTS WITH DELINQUENCY HISTORIES"

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-18-0221 **IRB Exemption Date:** 06/19/18
TOPAZ Reference #: 106814

As a requirement of IRB Exemption you are required to:

1) Submit an Event Form and provide immediate notification of:
   - Any additions or changes in the procedures involving human subjects.
   - Every serious or unusual or unanticipated adverse event as well as problems with the rights or welfare of the human subjects.
2) Submit a Project Completion Report Form when the study is finished or discontinued.

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

MMV/em

Appendix B

Add Health Survey Questions (except Self-Regulation) used in Current Study

Delinquency and Juvenile Arrest Variables

Delinquency (Wave I & II) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
Wave I- In the past 12 months, how often did you…		
paint graffiti or signs on someone else's property or in a public place? (H1DS1)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
deliberately damage property that didn't belong to you? (H1DS2)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
take something from a store without paying for it? (H1DS4)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
get into a serious physical fight? (H1DS5)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
hurt someone badly enough to need bandages or care from a doctor or nurse? (H1DS6)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
drive a car without its owner's permission? (H1DS8)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
steal something worth more than $50? (H1DS9)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
go into a house or building to steal something? (H1DS10)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
use or threaten to use a weapon to get something from someone? (H1DS11)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency

Delinquency (Wave I & II) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
Wave I- In the past 12 months, how often did you…		
sell marijuana or other drugs? (H1DS12)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
steal something worth less than $50? (H1DS13)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
take part in a fight where a group of your friends was against another group? (H1DS14)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
Wave 2- In the past 12 months, how often did you...		
paint graffiti or signs on someone else's property or in a public place? (H2DS1)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
deliberately damage property that didn't belong to you? (H2DS2)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
take something from a store without paying for it? (H2DS4)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
drive a car without its owner's permission? (H2DS6)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
steal something worth more than $50? (H2DS7)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
go into a house or building to steal something? (H2DS8)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency

Delinquency (Wave I & II) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
Wave 2- In the past 12 months, how often did you...		
use or threaten to use a weapon to get something from someone? (H2DS9)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
sell marijuana or other drugs? (H2DS10)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
steal something worth less than $50? (H2DS11)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency
take part in a fight where a group of your friends was against another group? (H2DS13)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	0- no delinquency 1- yes delinquency

Juvenile Arrest (Wave IV) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
Have you ever been arrested? (H4CJ1)	0 - no 1 - yes 7- legitimate skip (those currently in prison)	1-1 0-0 7-1
How old were you? (H4CJ3)	12- 12 years and younger 13 -13 years 14- 14 years 15 -15 years 16 -16 years 17-17 years 18 -18 years and so on	1- 17 years and younger 0- 18 years and older
How old were you the first time you were arrested? (H4CJ4)	10- 10 years and younger 11-11 years 12- 12 years 13 -13 years 14- 14 years 15 -15 years 16 -16 years 17-17 years 18 -18 years and so on	1- 17 years and younger 0- 18 years and older

Demographic Variables

Biological Sex (Wave I) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded** (no recoding for this variable)
Interviewer, please confirm that R's sex is (male) female, ask if necessary. (BIO_SEX)	1- male 2- female	

Age (I, II, III, & IV) Add Health Survey Questions (variable names)	**Computation**
Birthdate Wave 1: What is your birth date? month (H1GI1M), 15th day, and year (H1GI1Y)	
Interview Date Wave 1: Month interview completed [IMONTH] Day interview completed [IDAY] Year interview completed [IYEAR]	
Age Wave 1	Date difference between birth date & interview date in years
Birthdate Wave 2: What is your birth date? month (H2GI1M),15th day, and year (H2GI1Y)	
Interview Date Wave 2: Month interview completed [IMONTH2] Day interview completed [IDAY2] Year interview completed [IYEAR2]	
Age Wave 2	Date difference between birth date & interview date in years
Birthdate Wave 3: Confirm birth date. month (H3OD1M), 15th day, and year (H3OD1Y)	
Interview Date Wave 3: Month interview completed [IMONTH3] Day interview completed [IDAY3] Year interview completed [IYEAR3]	
Age Wave 3	Date difference between birth date & interview date in years
Birthdate Wave 4: Respondent's date of birth – month (H4OD1M), 15th day, and year (H4OD1Y)	
Interview Date Wave 4: Month of Wave IV interview [IMONTH4] Day of Wave IV interview [IDAY4] Year of Wave IV interview [IYEAR4]	
Age Wave 4	Date difference between birth date & interview date in years

Ethnicity/Race (Wave I) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded** (no recoding for this variable)
Are you of Hispanic or Latino origin? (H1GI4)	0- no 1- yes	
What is your race? White (H1GI6A)	0- no 1 -yes	
What is your race? Black or African American (H1GI6B)	0- no 1- yes	
What is your race? American Indian or Native American (H1GI6C)	0- no 1- yes	
What is your race? Asian or Pacific Islander (H1GI6D)	0- no 1- yes	
What is your race? Other (H1GI6E)	0- no 1- yes	

Childhood Adversity Variables

Child Maltreatment (Wave III & IV) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
By the time you started 6th grade, how often had your parents or other adult caregivers left you home alone when an adult should have been with you? (H3MA1)	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 6- This has never happened	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 0- never
How often had your parents or other adult caregivers not taken care of your basic needs, such as keeping you clean or providing food or clothing? (H3MA2)	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 6- This has never happened	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 0- never
Before your 18th birthday, how often did a parent or other adult caregiver say things that really hurt your feelings or made you feel like you were not wanted or loved? (H4MA1)	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 6- This has never happened	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 0- never
Before your 18th birthday, how often did a parent or adult caregiver hit you with a fist, kick you, or throw you down on the floor, into a wall, or downstairs? (H4MA3)	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 6- This has never happened	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 0- never
How often did a parent or other adult caregiver touch you in a sexual way, force you to touch him or her in a sexual way, or force you to have sexual relations? (H4MA5)	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 6- This has never happened	1- one time 2- two times 3- three to five times 4- six to ten times 5- more than ten times 0- never

Violent Victimization (Wave I &II) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded** (no recoding for this variable)
Wave I- During the past 12 months, how often did each of the following things happen?		
You saw someone shoot or stab another person (H1FV1)	0- never 1- once 2- more than once	
Someone pulled a knife or gun on you (H1FV2)	0- never 1- once 2- more than once	
Someone shot you (H1FV3)	0- never 1- once 2- more than once	
Someone cut or stabbed you (H1FV4)	0- never 1- once 2- more than once	
You were jumped. (H1FV6)	0- never 1- once 2- more than once	
Wave II - During the past 12 months, how often did each of the following things happen?		
You saw someone shoot or stab another person (H2FV1)	0- never 1- once 2- more than once	
Someone pulled a knife or gun on you (H2FV2)	0- never 1- once 2- more than once	
Someone shot you (H2FV3)	0- never 1- once 2- more than once	
Someone cut or stabbed you (H2FV4)	0- never 1- once 2- more than once	
You were jumped (H2FV5)	0- never 1- once 2- more than once	

Economic Hardship (survey for caregivers at Wave I) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded** (no recoding for this variable)
Last month, did you or any member of your household receive:		
Aid to Families with Dependent Children (AFDC)? (PA57C)	0- no 1- yes	
food stamps? (PA57D)	0- no 1- yes	

Adult Well-Being Outcomes at Wave IV

Depression (Wave IV) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
During the past seven days:		
You were bothered by things that usually don't bother you (H4MH18)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You could not shake off the blues, even with help from your family and your friends. (H4MH19)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You felt you were just as good as other people. (H4MH20)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	3- never or rarely 2- sometimes 1- a lot of the time 0- most of the time or all of the time
You had trouble keeping your mind on what you were doing (H4MH21)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You felt depressed. (H4MH22)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You felt happy. (H4MH24)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	3- never or rarely 2- sometimes 1- a lot of the time 0- most of the time or all of the time
You enjoyed life. (H4MH25)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	3- never or rarely 2- sometimes 1- a lot of the time 0- most of the time or all of the time
You felt sad. (H4MH26)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	

Depression (Wave IV) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
During the past seven days:		
You felt that people disliked you (H4MH27)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	

Stress (Wave IV) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
In the last 30 days:		
How often have you felt that you were unable to control the important things in your life? (H4MH3)	0- never 1- almost never 2- sometimes 3- fairly often 4- very often	
How often have you felt confident in your ability to handle your personal problems? (H4MH4)	0- never 1- almost never 2- sometimes 3- fairly often 4- very often	4- never 3- almost never 2- sometimes 1- fairly often 0- very often
How often have you felt that things were going your way? (H4MH5)	0- never 1- almost never 2- sometimes 3- fairly often 4- very often	4- never 3- almost never 2- sometimes 1- fairly often 0- very often
How often have you felt that difficulties were piling up so high that you could not overcome them? (H4MH6)	0- never 1- almost never 2- sometimes 3- fairly often 4- very often	

Alcohol and Other Drug Use (Wave IV) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded** (no recoding for this variable)
During the past 12 months, on how many days have you been drunk or very high on alcohol? (H4TO38)	0- none 1- 1 or 2 days in the past 12 months 2- once a month or less (3 to 12 days in the past 12 months) 3- 2 or 3 days a month 4- 1 or 2 days a week 5- 3 to 5 days a week 6- every day or almost every day	
During the past 12 months, on how many days did you use marijuana? (H4TO70)	0- none 1- 1 or 2 days in the past 12 months 2- once a month or less (3 to 12 days in the past 12 months) 3- 2 or 3 days a month 4- 1 or 2 days a week 5- 3 to 5 days a week 6-every day or almost every day	
During the past 12 months, on how many days did you use {favorite drug} (H4TO98) FAVORITE DRUG USE CATEGORY: 'sedatives' (downers, such as barbiturates, sleeping pills, Quaalude, or Seconal). 'tranquilizers' (such as Librium, Valium, or Xanax). 'stimulants' (uppers, such as amphetamines, prescription diet pills, Ritalin, Preludin, or speed). 'pain killers' (opioids, such as Vicodin, OxyContin, Percocet, Demerol, Percodan, or Tylenol with codeine). 'steroids' ('body building' drugs). 'cocaine' (crack, coca leaves). 'crystal meth' (ice). 'other illegal drugs' (such as LSD, PCP, ecstasy, heroin, or mushrooms; or inhalants)	0- none 1- 1 or 2 days in the past 12 months 2- once a month or less (3 to 12 days in the past 12 months) 3- 2 or 3 days a month 4- 1 or 2 days a week 5- 3 to 5 days a week 6-every day or almost every day	

Obesity (Wave IV) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
Body Mass Index classification (H4BMICLS)	1- underweight: <18.5 2- normal 18.5-<25 3- overweight: 25-<30 4- obese I: 30-<35 5- obese II: 35-<40 6- obese III: 40+	Underweight not included in analysis 0- normal 1- overweight 2- obese I 3- obese II 4- obese III

Criminal Behaviors (Wave IV) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
In the past 12 months, how often did you: deliberately damage property that didn't belong to you? (H4DS1)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
In the past 12 months, how often did you: steal something worth more than $50? (H4DS2)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
In the past 12 months, how often did you: go into a house or building to steal something? (H4DS3)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): use or threaten to use a weapon to get something from someone? (H4DS4)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): sell marijuana or other drugs? (H4DS5)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): steal something worth less than $50? (H4DS6)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): take part in a physical fight where a group of your friends was against another group? (H4DS7)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): buy, sell, or hold stolen property? (H4DS8)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): use someone else's credit card, bank card, or automatic teller card without their permission or knowledge? (H4DS9)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	

Criminal Behaviors (Wave IV) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
(In the past 12 months, how often did you): deliberately write a bad check? (H4DS10)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): get into a serious physical fight? (H4DS11)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
(In the past 12 months, how often did you): hurt someone badly enough in a physical fight that he or she needed care from a doctor or nurse? (H4DS12)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	system missing= 0 0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times
Which of the following things happened in the past 12 months: you pulled a knife or gun on someone? (H4DS19)	0- no 1- yes	
Which of the following things happened in the past 12 months: you shot or stabbed someone? (H4DS20)	0- no 1- yes	

Adult Well-Being Outcomes at Wave III

Depression (Wave III) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
You were bothered by things that usually don't bother you. (H3SP5)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You could not shake off the blues, even with help from your family and your friends, during the past seven days (H3SP6)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You had trouble keeping your mind on what you were doing, during the past seven days (H3SP8)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You were depressed, during the past seven days (H3SP9)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You enjoyed life, during the past seven days (H3SP11)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	3- never or rarely 2- sometimes 1- a lot of the time 0- most of the time or all of the time
You were sad, during the past seven days (H3SP12)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You felt that people disliked you, during the past seven days (H3SP13)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	
You felt that you were just as good as other people, during the past seven days. (H3SP7)	0- never or rarely 1- sometimes 2- a lot of the time 3- most of the time or all of the time	3- never or rarely 2- sometimes 1- a lot of the time 0- most of the time or all of the time

Stress (Wave III) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded** (no recoding for this variable)
In the past 12 months, have you taken any prescription medication—that is, a medicine that must be prescribed by a doctor or nurse? (H3ID25)	0- no 1- yes	
For which of the following conditions have you taken prescription medication in the past 12 months: depression or stress (H3ID26F)	0- no 1- yes	

Alcohol and Other Drug use (Wave III) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
During the past 12 months, on how many days have you been drunk or very high on alcohol? (H3TO43)	0- none 1- 1 or 2 days in the past 12 months 2- 2 once a month or less (3 to 12 times in the past 12 months) 3- 2 or 3 days a month 4 -1 or 2 days a w eek 5- 3 to 5 days a w eek 6- every day or almost every day	0 -no 1 to 6- recoded to 1- yes
In the past year, have you used anabolic steroids or other illegal performance enhancing substances for athletes? (H3TO107)	0 -no 1 -yes	
In the past year, have you used marijuana? (H3TO109)	0 -no 1 -yes	
In the past year, have you used any kind of cocaine? (H3TO112)	0 -no 1 -yes	
In the past year, have you used crystal meth? (H3TO115)	0 -no 1 -yes	
In the past year, have you used any of these types of illegal drugs? (H3TO118)	0 -no 1 -yes	
In the past year, have you injected an illegal drug? (H3TO121)	0 -no 1 -yes	

Obesity (Wave III) Add Health Survey Questions (variable names)	**Responses Coded**	**Responses Recoded**
Body mass index (BMI) was calculated according to the metric imperial formula: BMI (kg/m^2) = weight _kg/ (height in meters* height in meters)		
Measured height [feet] (H3HGT_F)	4 thru to 7 feet	
Measured height [inches] (H3HGT_I)	0 thru to 5 inches	
Measured height, partial inch (H3H GT_PI)	0 thru to 0.875 inches	
Measured weight (H3WGT)	84 thru to 330 lbs. over 330 lbs.	
BMI categories	1- underweight: <18.5 2- normal 18.5-<25 3- overweight: 25-<30 4- obese I: 30-<35 5- obese II: 35-<40 6- obese III: 40+	Underweight not included in analysis 0- normal weight 1- overweight 2- obese I 3- obese II 4- obese III

Criminal Behaviors (Wave III) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
In the past 12 months,		
how often did you deliberately damage property that didn't belong to you? (H3DS1)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you steal something worth more than $50? (H3DS2)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you go into a house or building to steal something? (H3DS3)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you use or threaten to use a weapon to get something from someone? (H3DS4)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you sell marijuana or other drugs? (H3DS5)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you steal something worth less than $50? (H3DS6)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you take part in a physical fight where a group of your friends was against another group? (H3DS7)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you buy, sell, or hold stolen property? (H3DS8)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you use someone else's credit card, bank card, or automatic teller card without their permission or knowledge? (H3DS9)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you deliberately write a bad check? (H3DS10)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	

Criminal Behaviors (Wave III) Add Health Survey Questions (variable names)	Responses Coded	Responses Recoded
In the past 12 months,		
how often did you use a weapon in a fight? (H3DS11)	0- never 1- 1 or 2 times 2- 3 or 4 times 3- 5 or more times	
how often did you hurt someone badly enough in a physical fight that he or she needed care from a doctor or nurse? (H3DS17)	0- 0 times 1- 1 time 2- 2 times 3- 3 times 4- 4 times 5- 5 times 7- 7 times 8- 8 times 12- 12 times 15- 15 times 23- times 50- times	0- 0 never 1- 1 to 2 times 2- 3 to 4 times 3- 5 to 50 times
You pulled a knife or gun on someone. (H3DS18H)	0- no 1- yes	
You shot or stabbed someone. (H3DS18I)	0- no 1- yes	

Appendix C

Self-Regulation Deficiency Measure for Current Study

Add Health Survey Questions used by Beaver et al. (2009; Wave III)

Add Health Survey Questions (and variable names)	Responses Coded	Responses Recoded
How satisfied are you with your life as a whole (H3S P3)	1 -very satisfied 2 -satisfied 3 -neither satisfied nor dissatisfied 4 -dissatisfied 5 -very dissatisfied	5 -very satisfied 4 -satisfied 3 -neither satisfied or dissatisfied 2 -dissatisfied 1 -very dissatisfied
Do you agree or disagree that you go out of your way to avoid having to deal with problems in your life? (H3S P17)	1- strongly agree 2 -agree 3 -neither agree nor disagree 4- disagree 5- strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree
Do you agree or disagree that when making a decision, you go with your "gut feeling" and don't think much about the consequences of each alternative? (H3S P18)	1- strongly agree 2 -agree 3- neither agree nor disagree 4 -disagree 5- strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree
Do you agree or disagree that you like yourself just the way you are (H3S P21)	1- strongly agree 2 -agree 3 -neither agree nor disagree 4 -disagree 5- strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree
Do you agree or disagree that you feel you are doing things just about right (H3S P22)	1- strongly agree 2 -agree 3- neither agree nor disagree 4 -disagree 5- strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree

Add Health Survey Questions (and variable names)	Responses Coded	Responses Recoded
Do you agree or disagree that you like to take risks? (H3S P23)	1- strongly agree 2- agree 3 -neither agree nor disagree 4 -disagree 5- strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree
Do you agree or disagree that you live your life without much thought for the future? (H3S P24)	1- strongly agree 2- agree 3- neither agree nor disagree 4 -disagree 5 -strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree
Do you agree or disagree that in social situations, you tend not to follow the crowd, but instead behave in a way that suits your mood at the time? (H3S P26)	1- strongly agree 2 -agree 3 -neither agree nor disagree 4 -disag ree 5 -strongly disagree	5- strongly agree 4 -agree 3 -neither agree nor disagree 2 -disagree 1- strongly disagree
I often try new things just for fun or thrills, even if most people think they are a waste of time. (H3TO27)	1 -not true 2 -a little true 3 -somewhat true 4 -pretty true 5 -very true	
When nothing new is happening, I usually start looking for something exciting. (H3TO28)	1- not true 2 -a little true 3 -somewhat true 4 -pretty true 5- very true	
I can usually get people to believe me, even when what I'm saying isn't quite true. (H3TO29)	1 -not true 2 -a little true 3 -somewhat true 4- pretty true 5 very true	

Add Health Survey Questions used by Beaver et al. (2009; Wave III) continued

Add Health Survey Questions (and variable names)	Responses Coded	Responses Recoded
I often do things based on how I feel at the moment. (H3TO30)	1- not true 2 -a little true 3- somewhat true 4- pretty true 5 -very true	
I sometimes get so excited that I lose control of myself. (H3TO31)	1- not true 2- a little true 3-somewhat true 4 -pretty true 5 -very true	
I like it when people can do whatever they w ant, without strict rules and regulations. (H3TO32)	1- not true 2 -a little true 3 -somewhat true 4 -pretty true 5- very true	
I often follow my instincts, without thinking through all the details. (H3TO33)	1- not true 2- a little true 3 -somewhat true 4 -pretty true 5 -very true	
I can do a good job of "stretching the truth" when I'm talking to people. (H3TO34)	1- not true 2 -a little true 3 -somewhat true 4 -pretty true 5 -very true	
I change my interest a lot because my attention often shifts to something else. (H3TO35)	1- not true 2 -a little true 3 -somewhat true 4- pretty true 5 -very true	
You had trouble keeping your mind on what you were doing, during the past seven days (H3S P8)[a]	0- never or rarely 1 -sometimes 2 -a lot of the time	

Add Health Survey Questions (and variable names)	Responses Coded	Responses Recoded
	3 -most or all the time	
You enjoyed life, during the past seven days (H3S P11)[a]	0 -never or rarely 1 -sometimes 2-a lot of the time 3- most or all the time	
You were sad, during the past seven days (H3S P12)[a]	0 -never or rarely 1 -sometimes 2 -a lot of the time 3- most or all the time	

Note. Add Health survey questions used by Beaver et al. (2009) Wave III Low Self-Control Scale. These questions were used to create the self-regulation deficiency measure for the current study.

[a]Questions not included in the current study as they overlapped with the measure for depression at Wave IV.

Adapted from "Evidence of Genetic and Environmental Effects on the Development of Low Self-Control," by K.M. Beaver, M. Ratchford, & C.J. Ferguson, 2009, Criminal Justice and Behavior, 36(11), p.1170. (https://doi.org/10.1177/0093854809342859).

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PUBLICATIONS AND PRESENTATIONS

Huang, H., Fernandez, S. B, Rhoden, M.A., & Joseph, R. (2019a). Mental disorder, service utilization, and GPA: Studying mental health of former child welfare and youth experiencing homelessness in a campus support program. *Families in Society, 101*(1), 54-70. https://doi.org/10.1177/1044389419863177

Huang, H., Fernandez, S. B., Rhoden, M.A., & Joseph, R. (2019b). Elements of a college support program that matter: A case study. *Research on Social Work Practice, 29* (8), 949-960. doi:10.1177/1049731519832105

Huang, H., Fernandez, S., Rhoden, M.A., & Joseph, R. (2018). Serving former foster youth and homeless students in college. *Journal of Social Service Research, 44* (2), 209-222. https://doi.org/10.1080/01488376.2018.1441096

Huang, H., & Rhoden, M.A. (2017). *The effectiveness of service integration: Studying the Crossover Youth Practice Model*. https://pdfs.semanticscholar.org/dc47/64dd24b654550c666788ebb81368f4bc762c.pdf

Huang, H., Rhoden, M.A., Ryan, J.P. (2017). Group homes. In Elizabeth Bulls (Ed.), *Encyclopedia of Juvenile Delinquency and Justice*. Wiley Press. https://doi:.org/10.1002/9781118524275.ejdj0168

Huang, H., Ryan, J.P., & Rhoden, M.A. (2016). Foster care, geographic neighborhood change, and the risk of delinquency. *Children and Youth Services Review, 65*, 32-41. https://doi.org/10.1016/j.childyouth.2016.03.019

Rhoden, M.A. (2018, Sep 6-9). *Community reintegration and health outcomes of youth offenders: The effectiveness of service programs* [Poster session]. 23rd International Summit on Violence, Abuse & Trauma, San Diego, CA, USA.

Rhoden, M.A., & Macgowan, M.J. (2017, June 7-10). *Designing effective group interventions for trauma in young offenders: Lessons learned from current research* [Paper session]. International Association for Social Work with Groups Symposium, New York, NY, USA.

Rhoden, M.A., & Macgowan, M.J. (2017, Nov 9-11). *Treating PTSD, anxiety, depression and behavioral problems in youth offenders: An analysis of current research on trauma interventions* [Poster session]. International Society for Traumatic Stress Studies, Chicago, IL, USA.

Rhoden, M.A. Macgowan, M.J. & Huang, H. (2018, Oct 3-7). *Using play-based techniques to address psychological trauma in young offenders* [Poster session]. Association for Play Therapy International Conference, Phoenix, AZ, USA.

Rhoden, M.A., Macgowan, M.J., & Huang, H. (2019). A systematic review of psychological trauma interventions for juvenile offenders. *Research on Social Work Practice*, *29* (8), 892-909. https://doi.org/10.1177/1049731518806578

Rhoden, M.A. Macgowan, M.J., & Huang, H. (2019, Feb 15). *Community reintegration and health outcomes of youth offenders: Research, policy & service programs* [Poster session]. FIU Robert Stempel College of Public Health and Social Work Research Day, Miami, FL, USA.

Rhoden, M.A., Macgowan, M.J., & Huang, H. (2019, June 13-15). *Using current research to inform trauma treatment for young offenders* [Paper session]. National Association of Social Workers Florida Annual Conference, Orlando, FL, USA.