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Examining the Intergenerational Effects of Adverse Childhood Experiences on Parenting
Practices, Offspring Antisocial Behavior, and Later Criminal Offending

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Abstract

Examining the Intergenerational Effects of Adverse Childhood Experiences on Parenting
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By April Brown

Background: Crime is considered a threat to community safety and to community health, and therefore has peaked interest across disciplines. Studies have identified associations between 1) parenting practices and antisocial behaviors and 2) antisocial behaviors and criminal offending. Considering the relationships between adverse childhood experiences (ACEs) and parenting practices, ACEs and antisocial behaviors, and ACEs and criminal offending, it is interesting that few studies have examined the intergenerational effects of ACEs on antisocial behavior and criminal offending.

Purpose: The purpose of this study was to evaluate the role of ACEs in predicting parenting practices, offspring antisocial behavior, and later criminality. Using the Life Course Model as a framework for how intrapersonal and interpersonal factors influence behavioral development, this study aimed to assess 1) the effects of caregiver ACEs on offspring ACEs and parenting practices; 2) the intergenerational effects of ACEs and parenting practices on offspring antisocial behavior, and 3) the intergenerational effects of ACEs, parenting practices, and antisocial behavior on subsequent criminal offending.

Method: This study used data from the Longitudinal Studies of Child Abuse and Neglect Assessments 0-18, which includes a sample of children (N=902) and their mothers who were followed from age ≤4 through age 18 to assess the etiology and impact of child maltreatment. The effects of caregiver-level factors on child-level factors and criminal offending were estimated by constructing a series of regression models, including tests for effect modification.

Results: Results indicated that caregiver history of maltreatment predicted later family hardship, caregiver discipline tactics, and offspring antisocial behaviors; offspring childhood adversity, parental monitoring, and caregiver discipline tactics were associated with offspring antisocial behavior; and offspring exposure to violence and antisocial behaviors predicted later criminal offending.

Conclusion and Recommendation: Results may allude to distal associations when assessing the intergenerational effects of adverse childhood experiences on criminal offending, but it is clear that the primary point of intervention may be to increase effective parenting practices. Discipline tactics that mirror an authoritative style appear to reduce child antisocial behavior, and may potentially mitigate the effects of antisocial behaviors and exposure to violence on later criminal offending.

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I. Introduction

Violence and criminal offending are a popular study topic in the social science research community, as society has attempted to identify motivations for offending and best practices for sanctioning perpetrators. The terms "violence," "crime," and "public health" were rarely used in the same sentence prior to 35 years ago, but with the United States' success in preventing and treating infectious disease, the numbers and rates of homicide and suicide have risen into the top 20 causes of death in the U.S. (Centers for Disease Control and Prevention [CDC], 2014a; Dahlberg & Mercy, 2009). In fact, the CDC (2014b) identifies violence as a public health problem that impacts the health of communities and affects hosts of individuals around the country, and deaths associated with criminal violence cost the US an estimated $107 billion annually. With an increasing acceptance of multilevel social determinants of health and the acknowledgement of behavioral factors in the development and prevention of health outcomes, public health professionals remain optimistic about addressing the behavioral mechanisms that are associated with interpersonal violence and crime perpetration (Dahlberg & Mercy, 2009).

In 2013, the National Crime and Victimization Survey indicated that an estimated 6.1 million US residents age 12 years or older were victims of violent crime, and an alarming 16.8 million were victims of property crime (Truman & Langton, 2014). The rates of violent crime (i.e. rape or sexual assault, robbery, aggravated assault, and simple assault) and property crime (i.e. burglary, theft, and motor vehicle theft) have marginally declined since 2011, but there have been no significant changes in the rate of violent crime since 2012 (Truman & Langton, 2014).

Crime is considered a threat to community safety and to community health, and therefore has peaked interest across disciplines. Traditionally, the medical community has focused its attention on victims and the suffering that results from injustices inflicted through criminal behavior such as shootings or assault (Moore, 1995). Of chief importance to the justice system is *who* committed the crime, how they might be apprehended, and how they might be prosecuted in an effort to discourage crime perpetration (Moore, 1995). Psychological researchers and criminologists, however, have been primarily interested in understanding the expression of violent and criminal behaviors, such as personality characteristics, familial relationships, and the quality of perpetrator's childhood home environment (Liu, 2004; Miner & Clarke-Stewart, 2008). From a public health perspective, researchers who are working towards examining key risk factors for offending and developing intervention and prevention programs (e.g. Farrington, 2000) would benefit from taking a multidisciplinary approach to understand the psychosocial mechanisms that function across life span and underlie crime perpetration.

Crime perpetration and delinquency are of increasing interest to researchers in the public health arena, who are attempting to work towards crime prevention in order to lessen the burden of crime victimization on society. Developmental psychopathologists, juvenile justice system experts, and criminologists have dedicated many years to understanding the causes of crime and delinquency through longitudinal studies, but researchers note that the path to criminality is complex (Shader, 2001). Different theoretical models have been proposed, but in actuality there are numerous risk factors that increase youth's chance of offending. There are several ways in which these risk

factors can interact to have multiplicative effects that can be either protective or lead to

greater risk for the outcome of interest. (Shader, 2001). In order to thoroughly understand

the equifinality of crime perpetration, the investigation of the perpetrator's childhood

experiences, relationship with caregivers, and stability of antisocial behavior patterns is

essential.

II. Literature Review

Pathways to Criminality

Charting the course of development throughout life span is the hallmark of the social and behavioral sciences, and criminologists have long been interested in tracking criminal activity over time. There is an extensive research literature on the longitudinal patterning of criminality via trajectory methods, and an assortment of risk and protective factors have been identified. For example, males are at greater risk for delinquency, along with those who demonstrate hyperactivity, aggression, antisocial behavior in early childhood and adolescence, and engage in risk taking behaviors (Moffit & Capsi, 2001; Moffitt, Lynam, & Silva, 1994; Tremblay & LeMarquand, 2001; Shader, 2001). Examining longitudinal trajectories of criminality and their predictors allows researchers to draw inferences about stability and change of behaviors, as well as variation in criminal offending over the life-course. Consequently, the path to criminality is rarely discussed in the absence of one's history of juvenile delinquency, early antisocial behavior, and caregiver parenting practices (e.g. Patterson, DeBaryshe, & Ramsey, 1990; Reid, Patterson, & Snyder, 2002; Sampson & Laub, 1993).

Antisocial behaviors are characterized by aggression and other patterns of behavior that are verbally or physically harmful to people and violate societal expectations or norms (Liu, 2004; Miner & Clarke-Stewart, 2008). The relationship between antisocial behaviors and crime is well documented in the literature (Bliesener, Beelmann, & Stemmler, 2012), and age at first offense has been identified as one of the best predictors of future criminality (Farrington et al., 1990). This association between

antisocial behaviors, age of first offense, and criminality, however, is best understood

using Moffit's (1993) Developmental Taxonomy of Antisocial Behavior.

According to Moffit's (1993) theory, there are substantial differences in the

stability of antisocial behavior, delinquency, and criminal offending among individuals.

For some, antisocial behavior patterns persist throughout the life course, but for the large

majority of others, antisocial behaviors are limited primarily to the adolescent period,

peak around age 17, and tend to subside shortly after entering young adulthood (Moffit,

1993). Moffitt (1993) describes individuals who fall into the *life-course persistent*

subtype as rare and behaviorally coherent (having *heterotypic continuity*), where their

underlying disposition remains the same but their expressions of antisocial behaviors

change throughout lifespan in response to new social opportunities.

The *adolescence-limited* subtype, however, is ubiquitous and is characterized by

discontinuity (Moffitt, 1993). Specifically, these individuals have no history of antisocial

behavior in childhood and are at lower risk for the expression of antisocial behaviors in

adulthood relative to those of the *life-course persistent* subtype. Change in delinquent

involvement is abrupt. Individuals in the *adolescence-limited* subtype have occasional

"crime-free" periods, and there will be little to no consistency in their antisocial behavior

patterns across situations. Relative to their *life-course persistent* peers, *adolescence-

limited* delinquents are likely to engage in antisocial behaviors when profitable, but are

also able to engage in prosocial behaviors when more socially rewarding.

Moffitt (1993) suggested that children's predispositions toward antisocial

behavior may be exacerbated under deviant rearing conditions, and numerous studies

have since indicated that negative parenting practices (e.g., harsh discipline, emotional

neglect) are risk factors for antisocial behaviors and delinquency (e.g. Ehrensaft et al., 2003). In 2001, Moffitt and Capsi found that childhood-onset delinquents were more likely to have inadequate parenting, neurocognitive deficits, and temperament and behavior problems when compared to adolescent-onset delinquents. The prevalence of this pathological pathway differed for males and females, however, as males were ten times more likely to have childhood-onset delinquency when compared to their female counterparts (Moffitt & Capsi, 2001).

Findings from other studies have been consistent with this finding, demonstrating that certain parenting styles are particularly relevant to the early onset of conduct problems in boys (Ehrensaft et al., 2003). High parent-child conflict, harsh physical punishment, and low parental monitoring have all been associated with antisocial behaviors (Ehrensaft et al., 2003). A number of studies have revealed that individuals exposed to child-rearing practices ranging from lax parenting to punitive parenting, to severe childhood abuse tend to be antisocial, aggressive, and later commit violent crimes (Haapasalo & Pokela, 1999).

Parental maltreatment during childhood might prevent the child from reaching important developmental milestones, including self-regulation, which places that individual at greater risk of poor psychological functioning in adulthood (Schroeder, Bulanda, Giordan0 & Cernkovich, 2010). Kaplow and Widom (2007), for example, found a positive association between age of onset of child maltreatment and antisocial personality disorder symptoms. Few studies, however, have examined potential mediating mechanisms that might explain the relationship between later age of onset of maltreatment and higher levels of antisocial and externalizing problems in adulthood

(Kaplow & Widom, 2007). It is possible that older children respond to maltreatment with maladaptive coping strategies in the form of oppositional behaviors towards others (e.g. disobedience or hostility).

Taken together, the literature might lead one to posit that the primary point of intervention for crime perpetration is antisocial behavior. Nonetheless, the delineation between groups of offenders under Moffitt's (1993) taxonomy clearly indicates that developmental patterns of criminality exhibit different shapes at different ages, vary between the sexes, and patterns may be differentially affected by certain risk factors (Piquero, 2008). In addition, certain factors may be protective, while others may interact with one another to have positive, negative, or offsetting effects.

Theoretical Framework

The Socio-ecological Perspective

Researchers have categorized risk and protective factors in a variety of ways. One review of the literature suggests that the major risk and protective factors of criminality and delinquency can be classified using three broad socio-ecological categories: intrapersonal, interpersonal, and community level factors (McLeroy, Bibeau, Steckler, & Glanz, 1988; Shader, 2001).

Intrapersonal levels of influence include individual psychological, behavioral, or mental characteristics that are associated with a given behavior (Robinson, 2008). In this case, gender, early antisocial behaviors, aggression, low IQ, and hyperactivity have all been linked to crime perpetration (Moffitt, Lynam, & Silva, 1994; Tremblay & LeMarquand, 2001).

Interpersonal levels of influence refer to exchanges or interactions within primary groups such as family, friends, or peers (Robinson, 2008), which have been evidenced in this case through well-documented associations between criminality, family environment, and caregiver dynamics (Ehrensaft et al., 2003; Haapasalo & Pokela, 1999). For example, negative parenting practices such as low levels of monitoring, high levels of rejection and hostility, along with weak parent-child bonds have consistently predicted juvenile delinquency and criminal offending in adulthood (Sampson & Laub, 1993; Schroeder, Bulanda, Giordano, & Cernkovich, 2010). The relationship between parenting practices and delinquency is not static, however, and correlates of may change during the life-course (Hoeve et al., 2009). For instance, warm and supportive relationships with parents or other adults during early childhood are more likely to decrease chances of delinquency relative to warm and supportive relationships with parents or other adults during mid and late adolescence (Hoeve et al., 2009; Shader, 2001). Nonetheless, supportive parenting behaviors are negatively associated with delinquency in general, further indicating that parental support, warmth, responsiveness, and acceptance are protective factors against delinquency and criminality (e.g. Barnes & Farrell, 1992; Simons, Robertson, & Downs, 1989).

Lastly, community level influences include social networks within schools or neighborhood environments that may promote or constrain behaviors (Robinson, 2008). One of the most established predictors of criminality is residing in an adverse environment. Disorganized environments are believed to have weak social control networks, and high levels of poverty and crime, which are associated with increased risk

for involvement in delinquent behaviors for children living in these environments (Shader, 2001).

Ultimately, it is clear that behavior does not develop in a vacuum, but is instead the result of complex interactions between the person and their environment over time. The Social Ecological Model is useful for organizing and interpreting well-established risk and protective factors for criminality, but borrowing from other theoretical frameworks could bolster our understanding of pathways to criminality. The Life Course Model, in particular, posits that there is a unique relationship between time and human behavior and looks at how chronological age, transitions, life experiences, and relationships shape people's lives from birth to death (Fine & Kotelchuck, 2010; Hutchinson, 2008).

Life Course Model: A Coherent Framework for the Development of Criminality

Taken together, the literature suggests that parenting practices are associated with childhood and adolescent antisocial behavior, and early antisocial behavior is linked to subsequent criminal offending during adulthood. What has been less studied, however, is the cyclic effect of adverse childhood experiences at varying levels of influence along the pathway to criminality. In this section, associations between adverse childhood experiences, parenting practices, antisocial behavior patterns, and criminal offending are explored using the Life Course Model.

The Life Course Model is relatively young, has evolved substantially over the past 45 years (Hutchinson, 2008), and makes an important contribution to understanding the development of criminality. First, it offers a framework for understanding the development and sustainability of behavioral patterns; particularly how broad social,

economic, and environmental factors affect individual personal and social development (Fine & Kotelchuck, 2010; Sampson & Laub, 2005a). According to Fine and Kotelchuck (2010), scholars who take on the life course perspective draw on growing and converging scientific evidence ultimately centered on five major themes: *pathways or trajectories, early programming, critical or sensitive periods, cumulative impact*, and *risk and protective factors*.

Pathways or trajectories refer to the integrated continuum of exposures, experiences, and interactions for individuals, which can be predicted for populations based on social, economic, and environmental factors (Fine & Kotelchuck, 2010). Throughout the life course, individuals go through a number of transitions (changes in role and status) and turning points (life events) that can modify trajectories of behaviors (Hutchinson, 2008). *Early Programming* occurs in response to early experiences, and adverse experiences can either result directly in disease or condition, or make an individual more susceptible to a condition in the future (Fine & Kotelchuck, 2010). Adverse, traumatic, or stressful experiences can occur at any point in the life course, but events that occur within *critical or sensitive periods* (which include, for example, the perinatal period, early childhood, or adolescence) have the greatest impact (Felliti et al., 1998). Still, episodic stress that may have had minimal impact on positive trajectories otherwise may have cumulative effects on health and development (i.e. *cumulative impact*) if an individual is exposed to multiple stressful episodes over the life course (Hutchinson, 2008).

However, pathways are not finite. Throughout lifespan, there are *protective factors* that can improve outcomes, and attenuate the effects of *risk factors* that

negatively affect health or development (Fine & Kotelchuck, 2010). While the major risk and protective factors of criminality and delinquency can be classified using the Socio-Ecological Model, Life Course Model provides insight into how these factors can be examined longitudinally. Exposure to risk factors can accumulate over many years, and studies indicate that there is a dose-response relationship between individual risk factor accumulation across multiple domains and an increased probability of later negatives outcomes (Loeber, Burke, & Pardini, 2009).

The life course perspective encourages researchers to think critically about how concepts such as *early programming* and *cumulative impact* can affect human behavior over time and how phases of life are intertwined. This framework also emphasizes the role of the intergenerational relationships, which support and control individual behavior (Hutchinson, 2008). From this perspective, the family is the "primary arena for experiencing and interpreting wider historical, cultural, and social phenomena" (Hutchinson, 2008, p. 21). Under this premise, family adversity during *critical or sensitive periods* has the potential to have lasting effects on behavioral development, which can cross generational lines.

Adverse Childhood Experiences: The Intergenerational Transmission of Violence

Adverse childhood experiences (ACEs) refer to non-normative experiences such as child abuse or neglect, parental substance abuse, witnessing violence, caregiver mental illness, or poverty (Felitti et al., 1998), each of which have been identified as key risk factors in the Life Course Model (Hutchinson, 2008). There is substantial evidence that childhood adversity has long-term consequences on individual achievement, economic productivity, and health status (Felitti et al., 1998). In fact, adults with adverse childhood

experiences are significantly more likely to have initiated alcohol use at younger ages, partaken in illicit drug use, and engaged in risky behaviors (Anda et al. 1995; Anda et al. 2006). Those who present with more risk behaviors are more likely to have difficulty maintaining supportive relationships and are at higher risk of violent crime, incarceration, and poverty (Scherrer et al., 2007). Studies have also documented direct associations between ACEs and criminality, where offenders have reported nearly four times as many ACEs as non-offenders (Reavis, Looman, Franco, & Rojas, 2013).

In the absence of sufficient protective relationships that reinforce healthy adaptation to stress, the probability of developing psychopathology, including antisocial behavior disorder, increases (American Academy of Pediatrics, 2012). Per the Life Course Model, life adversity during sensitive developmental periods like childhood has the potential to have a role in the progression of criminal offending and violent behavior, which lends support to the rationale behind identifying and intervening on modifiable risk factors.

Longitudinal studies of childhood adversity and mental health in young adults have revealed that the cumulative effect of ACEs is significantly associated with antisocial behaviors, depressive symptoms, and drug use during early transition to adulthood (Schilling, Aseltine, & Gore, 2007). Studies have also shown that a history of childhood abuse is associated with poorer parenting practices, specifically the use of physical and verbal punishment (Ferrari, 2002). One of the most common perspectives in the literature refers to a "cycle of violence" or the "intergenerational transmission of violence," in which theorists suggest that experiencing violence in childhood leads to the perpetration of violence in adulthood or to the abuse of children and partners (Widom &

Wilson, 2015). In this section, the theoretical mechanisms to explain the intergenerational transmission of violence will be explored from a Life Course perspective.

Family factors, such as discipline techniques and quality of the parent-child relationship, have been at the forefront of studies aiming to understand antisocial behavior for years, but it is first necessary to clearly distinguish between types of parenting styles. A number of studies have indicated that child-rearing practices, ranging from lax parenting to harsh parenting to severe childhood abuse, are associated with antisocial behavior, aggression, and violent crime perpetration (Haapasalo & Pokela, 1999).

In the literature, harsh parenting has been characterized as use of threats and/or physical punishment as corrective action against child problem behavior (Chang, Schwartz, Dodge, & McBride-Chang, 2003). Other major parenting typologies include authoritative parenting, which is characterized by nonviolent discipline strategies, reasoning, and setting clear, nonintrusive or restrictive boundaries, and permissive parenting (also called "lax parenting"), which is characterized by leniency and avoidance of parent-child confrontation (Baumrind, 1991).

What is still not well understood, however, are the reciprocal processes within families that may lead to harsh parenting practices (Shaw & Bell, 1993). Perhaps the most popular theory used to describe the intergenerational transmission of violence is Bandura's (1973) Social Learning Theory (Widom & Wilson, 2015). According to this model, children acquire their behaviors through modelling and reinforcement and by imitating the behavior of people of higher influence, such as a parent (Bandura, 1973).

Bowlby's (1969) attachment theory has also been commonly used in an attempt to explain the cycle of violence (Widom & Wilson, 2015). According to this framework, individuals develop an "internal working model" during infancy, which is derived from the bond that infants develop with their caregiver. The "internal working model" serves as the basis of individuals' worldview. The infant signals its needs for care, and differences in the quality of attachment are due to the caregiver's sensitivity to its needs and responsiveness. Infants then form their basic expectations about the physical and interpersonal environment (Shaw & Bell, 1993). Under this framework, abuse, inconsistency, or rejection from a primary caregiver can diminish the quality of the bond, thereby facilitating the development of a hostile worldview (Widom & Wilson, 2015).

Therefore, individuals with a history of abuse and maltreatment might respond to normative interactions with others with hostility or aggressiveness. Interestingly, Rodriguez and Tucker (2011) have demonstrated that poor attachment history predicts child abuse potential and dysfunctional disciplinary style independent of personal history of abuse. Since child maltreatment can come from a variety of sources (e.g. non-parental figures), it is therefore possible that the quality of caregiver attachment mediates the relationship between history of abuse and later antisocial behaviors or violence perpetration.

From the neurophysiological perspective, adverse childhood experiences can affect biological stress response systems, which can have a global and negative impact on neurological development. Animal studies have revealed that the dysregulation of multiple systems, such as the sympathetic nervous system or the hypothalamic-pituitary-adrenal axis, can inhibit an effective response to stress. Chronic exposure to childhood

adversity, such as abuse or neglect, may result in an elevated and prolonged stress response, which is believed to prime individuals to react aggressively in certain situations and could impact child rearing practices (e.g. Sanchez, Ladd, & Plotsky, 2009).

More recently, behavioral geneticists have postulated that these physiological responses to stress are heritable (Capsi et al., 2002; Moffit, 2005). Some researchers believe that cycle of violence is due in part to the development and transmission of modified biological pathways (i.e. epigenetic factors), which result from prior maltreatment and adversity (e.g. Moffit, 2005). From this perspective, the activity of genes is altered, and individuals can be predisposed to antisocial or violent behavior (Widom & Wilson, 2015). Animal models of neglect, abuse, and trauma suggest that adversity has a lasting epigenetic impact on those directly exposed to the adversity and also on subsequent generations (Roth, Lubin, Funk, & Sweatt, 2009). Additionally, there is compelling evidence from twin and adoption studies that suggest some children might hold genetic predispositions towards violence or criminality, further supporting the notion that offense behavior is a multifactorial disorder with genetic and environmental contributions (see DiLalla & Gottesman, 1991).

In any case, it is clear that the intergenerational transmission of violence is plausible from a number of perspectives. The consequences of childhood adversity remain compelling, perplexing, and appear to cascade across several domains of functioning (Widom & Wilson, 2015). Adverse childhood experiences have been associated with a host of intrapersonal and interpersonal risk factors for violence and criminal offending, so its inclusion when examining pathways to criminality is justified. Although social scientists have dedicated many years to unfolding the short- and long-

term consequences of early life adversity, most of the research in this area has relied on cross-sectional studies and retrospective accounts (Widom & Wilson, 2015). It is therefore crucial that the influence of adverse childhood experiences on parenting, antisocial behaviors, and criminal offending is examined using prospective research designs.

Bridging the Gap: Study Aims

In summary, the literature on criminality is dense, but fragmented. Studies have identified associations between 1) parenting practices and criminal offending; 2) parenting practices and antisocial behaviors; and 3) antisocial behaviors and criminal offending. Considering the relationships between ACEs and parenting practices, ACEs and antisocial behaviors, and ACEs and criminal offending, it is interesting that few studies have examined the intergenerational effects of ACEs on antisocial behavior and criminal offending. Research in support of the cycle of violence has been limited to cross-sectional and retrospective deigns, and few (if any) have been able to take into account the caregiver's history of victimization as an antecedent factor in the nature of parenting practices when examining offspring antisocial behaviors and later criminality. This omission was addressed in the current study.

The purpose of this study was to evaluate the role of adverse childhood experiences in predicting parenting practices, offspring antisocial behavior, and later criminality. Using the Life Course Model as a framework for how intrapersonal and interpersonal factors influence behavioral development, this study aimed to assess 1) the effects of caregiver ACEs on offspring ACEs and parenting practices; 2) the intergenerational effects of ACEs and parenting practices on offspring antisocial

behavior, and 3) the intergenerational effects of ACEs, parenting practices, and antisocial

behavior on subsequent criminal offending (see Figure 2).

III. Method

Sample and Setting

This study used data from the Longitudinal Studies of Child Abuse and Neglect (LONGSCAN) Assessments 0-18, which includes a sample of children (N=902) and their mothers who were followed from age ≤4 through age 18 to assess the etiology and impact of child maltreatment (see Larrabee & Lewis, 2014; Runyan et al., 2014). LONGSCAN was a consortium of research studies that were initiated in 1991 at the University of North Carolina at Chapel Hill and five data collection sites around the US. There were three sites in the East (EA), Midwest (MW), and Northwest (NW), which were primarily urban, in addition to one site in the Southwest (SW) that was primarily suburban. There was also one statewide site in the South (SO), which included urban, suburban, and rural communities.

The sites' samples varied systematically in the level of risk for (and actual) maltreatment. Children in the EA cohort ($n=$ 282) were sampled from the clients of three pediatric clinics serving low-income, inner-city children. The MW cohort consisted of children ($n=245$) who were recruited from families reported to Child Protective Services, and the NW cohort ($n=254$) was selected from a pool of children who were judged to be at moderate risk, following a report to CPS for suspected child maltreatment. Participants from the SO cohort ($n=243$) were drawn from a population of children identified as high risk at birth by a state public health surveillance system, and the SW study cohort ($n=330$) consisted of maltreated children who had entered a county dependency system, specifically out-of-home placement with a relative or foster family, due to confirmed maltreatment.

Each site's cohort participated in extensive evaluations at age ≤4, 6, 8, 12, 14, 16, and 18, during which face-to-face interviews were conducted with the primary caregiver and child. Data were collected from multiple informants, including the primary caregiver, the study child, CPS case narratives, and Central Registry records. Gender was approximately evenly distributed (49% male, 51% female), and the majority of participants were African American (55.6%), followed by Caucasian (25.1%), Mixed Race (11.0%), Latino/a (6.8%), and those of "Other" ethnicities (1.3%).

Measures

Socio-demographic Characteristics. Data regarding sex, race/ethnicity, and family income at baseline were included in analyses. In addition to indicating the study child's sex, race/ethnicity, and family income, primary maternal caregivers also provided information about their race/ethnicity, employment status, marital status, and level of education at baseline.

Adverse Childhood Experiences (ACEs). ACEs were assessed in both primary caregivers and child participants by measuring exposure to adverse events such as sexual or physical abuse, violence, psychological maltreatment, and economic hardship. For the primary caregiver, ACEs were assessed using data from the study's "Caregiver's History of Loss and Victimization" module, which was administered at baseline. The current study used caregiver self-report data that was collected retrospectively regarding childhood exposure to maltreatment (i.e. physical and sexual abuse before the age of 18). For each child participant, data were collected prospectively regarding the occurrence of select adverse events at various assessment points. The current study used child self-

report data collected during adolescence (age 12, 14, and 16) regarding the child's

exposure to violence, child maltreatment, and experience with family hardship.

Caregiver Childhood Abuse. Primary maternal caregivers were asked to

retrospectively report history of childhood and adolescent physical abuse (2 items) and

sexual abuse (6 items). For example, caregivers were asked questions such as, "When

you were a child or teenager, did you experience excessive punishment by a parent

figure?" Items were designed to ask about the experience of specific acts, without

describing the acts as abusive, and were worded to align with conservative behavior-

based definitions of physical and sexual abuse. An indicator variable was derived to

denote history of sexual abuse and/or history of physical abuse, i.e. caregiver history of

childhood abuse.

Child Exposure to Violence. Childhood exposure to violence was measured using

items that assessed whether the child respondent had ever witnessed each of 8

increasingly serious acts of violence ranging from physical altercations to rape or murder.

Average exposure to violence was computed by averaging the sum of the indicator

variables for having witnessed arrests, physical violence, and sexual violence from each

assessment point. Higher scores indicate more exposure to violence.

Child Maltreatment. Child maltreatment was assessed using items from the

physical abuse, psychological maltreatment, sexual abuse, and parental neglect measures

that captured the study child's experience with a range of parental and household member

behaviors before elementary school, since starting elementary school, and in the last year.

Physical abuse was assessed in three domains: physical abuse by caregivers,

physical assault by non-caregiver household members, and community assault. The 15-

item physical abuse measure was designed to capture both experienced harm and threat of harm by asking about specific behaviors and injuries in a yes/no format.

Psychological maltreatment was assessed using 18 items. For example, respondents were asked questions such as, "Have any of your parents ever humiliated you very badly by putting you down a lot in front of other people?" Responses were collected on a 3-point scale, ranging from (0) *never* to (2) *often*.

To assess sexual abuse, the study child was administered an 11-item questionnaire, which asked about increasingly severe sexual experiences, which included: non-contact, fondling/attempted fondling, oral-genital contact/attempted contact, and penetration/attempted penetration. Respondents were asked to answer questions such as, "Has any adult or older kid ever made you look at something sexual, like pictures or a movie?" or "Has anyone ever gotten you to touch their private parts or bottom in some way?"

Parental neglect was assessed using select items from the study's "Neglectful Behavior Scale" module. Child respondents were asked questions such as, "How often did your parents make sure you bathed regularly?" or, "how often did your parents make sure you saw a doctor when you needed one?" in order to determine whether their caregiver appropriately responded to their basic and physical needs.

A single child maltreatment indicator was derived by examining endorsement of one or more items from each of the abuse, maltreatment, and neglect scales. Physical, psychological, and sexual abuse items were designed to ask about the experience of specific acts, without describing the acts as abusive, and were worded to align with conservative behavior-based definitions of abuse or maltreatment.

Family Economic Hardship. Family economic hardship was assessed using select items from the study's "Poverty Measure" module, which was administered to primary maternal caregivers at the study child's age 12, 14, and 16. Caregivers provided information on family food insecurity, hunger, lack or loss of basic needs and services, and financial worry or hardship during the past 30-days. A 15-item index was created for the current study, which included items that assessed food insecurity, hunger, and financial hardship. For example, responses to yes/no questions such as, "Did your household run out of money to buy food?" or, "have your lights been cut off because you did not have enough money to pay the bill?" were summed, and each family received an average family economic hardship score. Scores could range from 0-15, with higher scores indicating greater family hardship.

Parenting Practices. Parenting practices were assessed using the Conflict Tactics Scale (CTS; Straus, 1979) and a parental monitoring questionnaire, which were administered to primary maternal caregivers at age 12, 14, and 16. Responses to the CTS were averaged across all three assessment points.

Discipline Tactics. The CTS includes 22 items that broadly measure the extent to which caregivers use certain discipline tactics in response to the study child's problem behavior. Caregivers responded to questions such as "In the past year, how often have you [explained why something was wrong?], [hit him/her on the bottom with an object?], or [swore or cursed at him?]" Items ask about the frequency of nonviolent and violent parent-child interactions that have occurred in the past year, which included non-violent discipline (Cronbach's α= .70), psychological aggression (Cronbach's α= .68) and physical assault (Cronbach's α= .63). A single, three level discipline tactics variable was

derived to represent primary use of *permissive discipline tactics* (i.e. no discipline),

authoritative discipline tactics (i.e. nonviolent discipline), and *harsh discipline tactics*

(i.e. use of psychological aggression or physical assault).

   Parental Monitoring. Parental monitoring was assessed using a 5-item measure

of knowledge of youth's use of money, whereabouts and activities, and friends.

Caregivers responded to questions such as, "How much do you really know about what

[child] does with his or her free time?" Response options ranged from (0) *don't know* to

(2) *know a lot*. Scores could range from $0 - 10$, and higher scores indicate higher levels

of monitoring. A final parental monitoring score was derived by summing and averaging

scores from all three assessment points. Cronbach's alpha reliability coefficients for

parental monitoring varied, and indicated that this measure also has fair to good internal

consistency ($\alpha = .68$ at age 12; $\alpha = .79$ at age 14; and $\alpha = .82$ at age 16).

   Antisocial Behaviors. Antisocial behaviors were assessed using data from the

Child Behavior Checklist/4-18 (CBCL/4-18; Achenbach, 1991), which was given to

primary caregivers at when the study child was 6, 8, 10, 12, 14, and 16. The CBCL

consists of 118 items that measure the following eight syndromes: social withdrawal,

somatic complaints, anxiety/depression, social problems, thought problems, attention

problems, delinquent behavior, and aggressive behavior. The Externalizing Problems

subscale (Cronbach's $\alpha = .93$) combines the Delinquent Behavior and Aggressive

Behavior scales (33 items), and was used in the current study. The CBCL contains items

coded from *not true in the last six month* (0) to *very true/often true in the last six months*

(2), and raw scores reflect the sum of behaviors. Raw scores were averaged across all

assessment points, and a change score was computed by subtracting the baseline CBCL

externalizing behaviors raw score from the raw score at age 16.

Criminal Offending. The current study's primary outcome, criminal offending,

was assessed using data from LONGSCAN's "Young Adult Criminal Justice

Involvement" survey module. Data regarding each respondent's history of specific

charges and convictions was obtained at age 18. All charges and/or convictions have been

grouped into four broad categories: violent crimes, property crimes, drug-related crimes,

and other felonies or misdemeanors. For the purposes of this study, a single dichotomous

indicator variable was derived, which indicated whether the respondent had "1 or more

offenses" or "no offenses."

Data Analyses

Descriptive analyses were performed to assess sample demographic

characteristics and study-related factor characteristics. Data were examined for

multicollinearity and normality using tolerance statistics and univariate procedures.

Transformations were applied where necessary. Missing data were imputed using the

Expectations-Maximization algorithm in SPSS Version 18 (IBM Corp., 2013)

The effects of caregiver-level factors on child-level factors and criminal offending

were estimated by constructing a series of regression models, including tests for effect

modification. Semi-partial eta squared estimates (η_p^2) were used to assess effect size, and

were interpreted using the guidelines proposed by Wuensch (2012) (see also Rosnow &

Rosenthal, 2003). The values 0.01, 0.06, and 0.14 were interpreted as small, medium, and

large effects, respectively. Estimates were considered statistically significant at $p < 0.05$.

All analyses were conducted using SAS software, Version 9.3 for Windows (2011).

All analyses were adjusted for individual socio-demographic characteristics. Preliminary bivariate analyses indicated that child sex, child and caregiver race/ethnicity, caregiver marital status, and family income were significantly associated with the primary study outcome, offender status ($p < 0.01$). Due to multicollinearity between marital status and family income, only family income was used as a measure of socioeconomic status. Analyses containing only caregiver-level factors were adjusted for caregiver race/ethnicity and family income at baseline. Analyses containing child-level factors were adjusted for the study child's race/ethnicity, sex, and family income.

IV. Results

Sample Characteristics

The majority of child participants (N=902) in this study were Black (n = 436; 55.6%), and approximately 441 participants were female (56.2%). The majority of the sample had not committed any offenses by age 18 (n = 714; 79.2%), and approximately half of participants (n=467; 51.8%) had experienced some form of maltreatment during childhood.

At baseline, approximately 36.8% of primary maternal caregivers had *some high school education or less* (n = 267; 36.8%). The majority of caregivers were *single/never married* (n = 292; 40.1%), unemployed (n=420; 57.8%), and earned less than $24,999K per year (n = 517; 72.0%). Approximately, 32.9% of maternal caregivers experienced childhood maltreatment (n=297). Other sample characteristics are reported in Table 1, Table 2 and Figure 3.

Aim 1: Examine the Effects of Caregiver ACEs on Offspring ACEs and Parenting Practices

To examine the effects of caregiver childhood abuse on offspring ACEs, a series of multivariate regression analyses were performed using caregiver childhood abuse as the primary predictor (see Table 3). In the first step, the effects of caregiver childhood abuse on child ACEs were assessed. Results indicated that caregiver childhood abuse was not a significant predictor of offspring exposure to violence ($p = 0.45$) or offspring child maltreatment ($p = 0.36$). Analyses also indicated that caregiver childhood abuse significantly predicted later family economic hardship ($R^2 = 0.04$, F = 6.56, $p < 0.01$). Specifically, caregivers with a history of abuse during childhood scored significantly

higher on the family economic hardship index than caregivers without history of abuse during childhood ($b = 0.20$, $p = 0.004$, $\eta_p^2 = 0.013$).

In the second step, the effects of caregiver childhood abuse on discipline tactics and parental monitoring were assessed (see Table 4). Results from a multinomial logistic regression indicated that caregiver childhood abuse significantly predicted later discipline tactics ($\chi^2 = 30.68$, $p < .01$). Caregivers with a history of childhood abuse were nearly 1.5 times more likely to use authoritative discipline tactics (OR=1.46; 95%CI = 1.00, 2.12; $p = 0.04$) than permissive discipline tactics. Results also indicated that caregivers with a history of childhood abuse were not significantly more likely to use harsh discipline tactics than permissive discipline tactics ($p = 0.46$). Furthermore, results from a multiple linear regression indicated that caregiver history of childhood abuse was not significantly associated with parental monitoring ($p = 0.41$).

Aim 2: Examine the Intergenerational Effects of ACEs and Parenting Practices on Antisocial Behavior

In order to assess the intergenerational effects of ACEs and parenting practices on antisocial behavior, a series of four multivariate regression analyses were performed using caregiver childhood abuse, offspring ACEs, and parenting practices as the primary predictors, respectively. The final multivariate regression analysis was conducted to assess the main effects of caregiver and offspring ACEs and on antisocial behaviors while adjusting for parenting practices and vice-versa (see Table 3).

In the first step, the main effect of caregiver childhood abuse on child antisocial behavior was estimated (see Table 5). Results from the first multiple linear regression (Model 2A) indicated that caregiver childhood abuse significantly predicted offspring

antisocial behavior and met the criteria for small effects ($R^2 = 0.03$, F = 4.59, $p < 0.01$).

On average, children of caregivers with history of childhood abuse exhibited more

antisocial behaviors than children of caregivers without history of childhood abuse ($b =$

0.23, $p = 0.003$, $\eta_p^2 = 0.014$).

In the second step, the association between child ACEs and antisocial behavior

were estimated. Results from the second multiple linear regression (Model 2B) indicated

that child maltreatment, child exposure to violence, and family economic hardship were

significantly associated with child antisocial behavior ($R^2 = 0.08$, F = 9.81, $p < 0.01$).

Specifically, children who had experienced maltreatment, had greater exposure to

violence, and had more family hardship exhibited significantly more antisocial behaviors

($b = 0.30$, $p < 0.01$, $\eta_p^2 = 0.024$; $b = 0.14$, $p = 0.04$, $\eta_p^2 = 0.024$; $b = 0.22$, $p < .01$, $\eta_p^2 =$

0.027, respectively). Family economic hardship had the largest effect ($\eta_p^2 = 0.027$) on

antisocial behavior of all child-level ACE variables and met the criteria for small to

medium effects.

In the third step, the association between discipline tactics and parental

monitoring and antisocial behavior were estimated. Results from the third multiple linear

regression model (Model 2C) indicated that discipline tactics and parental monitoring

were significantly associated with child antisocial behaviors ($R^2 = 0.11$, F = 13.65, $p <$

0.01). On average, children of caregivers who used harsh discipline discipline tactics

exhibited greater antisocial behaviors relative to children of caregivers who used

permissive discipline tactics ($b = 0.19$, $p = 0.04$, $\eta_p^2 = 0.02$). The antisocial behaviors of

children with caregivers who used authoritative discipline tactics, however, did not

significantly differ from the behavior of children with caregivers who used permissive

discipline tactics ($p = 0.06$). Results further indicated that parental monitoring was positively associated with child antisocial behaviors, such that on average, with each unit increase in parental monitoring, there was a 0.65 point increase in child antisocial behavior with medium effects ($b = 0.65$, $p < 0.01$, $\eta_p^2 = 0.06$).

The final multiple linear regression analysis was conducted in order to assess the effects of caregiver and offspring ACEs on antisocial behaviors while adjusting for parenting practices and vice-versa (Model 2D). Results indicated that caregiver childhood abuse, offspring child maltreatment, and family hardship significantly predict offspring antisocial behavior ($R^2 = 0.16$, $F = 14.56$, $p < 0.01$). On average, children of caregivers with history of childhood abuse exhibited significantly greater antisocial behaviors ($b = 0.22$, $p = 0.003$, $\eta_p^2 = 0.01$). Children who experienced maltreatment and had greater family hardship also exhibited significantly greater antisocial behaviors ($b = 0.30$, $p < 0.01$, $\eta_p^2 = 0.024$; $b = 0.18$, $p < 0.01$, $\eta_p^2 = 0.027$, respectively). In this model, when adjusting for parenting practices, child exposure to violence was no longer a significant predictor of antisocial behavior ($p = 0.10$).

The relationship between parenting practices and offspring antisocial behavior while adjusting for ACEs also changed in this model. While there was still a positive association between parental monitoring and antisocial behavior ($b = 0.58$, $p < 0.01$, $\eta_p^2 = 0.049$), results indicated that children of caregivers who used authoritative discipline tactics had fewer antisocial behaviors than children of caregivers who use permissive discipline tactics ($b = -0.22$, $p = 0.008$, $\eta_p^2 = 0.025$). The antisocial behaviors of children with caregivers who used harsh discipline tactics did not significantly differ from those with caregivers who used permissive discipline tactics ($p = 0.08$).

Aim 3: Examine the Intergenerational Effects of ACEs, Parenting Practices, and

Antisocial Behavior on Subsequent Criminal Offending

In order to assess the intergenerational effects of ACEs, parenting practices, and antisocial behavior on criminal offending, a series of five multivariate logistic regression analyses were performed using caregiver childhood abuse, offspring ACEs, discipline tactics, and parental monitoring, and antisocial behavior as the primary predictors, respectively (see Table 3 and Table 6). An additional multivariate logistic regression model was performed in order to assess potential interaction effects between discipline tactics, parental monitoring, and child antisocial behavior on criminal offending.

In the first step, the main effect of caregiver childhood abuse on offspring criminal offending was estimated. Results from the first logistic regression (Model 3A) indicated that caregiver childhood abuse was not significantly associated with criminal offending ($p = 0.09$).

In the second step, the main effects of child ACEs on criminal offending were estimated. Results from the second logistic regression (Model 3B) indicated that those who had experienced childhood maltreatment were 1.5 times more likely to offend (OR = 1.51, 95%CI = 1.1, 2.1; $p = 0.02$), and for each unit increase in exposure to violence, the odds of criminal offending increased by approximately 1.5 (OR = 1.54, 95%CI = 1.13, 2.1; $p = 0.007$). Family economic hardship during childhood, however, did not significantly predict criminal offending ($p = 0.58$).

In the third step, the main effects of discipline tactics and parental monitoring on offspring criminal offending were estimated. Results from the third logistic regression (Model 3C) indicated that for each unit increase in parental monitoring, the odds of

criminal offending increased by 1.96 (OR = 1.96, 95%CI = 1.36, 2.83; p = 0.0003).

Discipline tactics, however, were not significantly associated with criminal offending (p. = 0.56).

In the fourth step, the main effects of antisocial behavior and change in antisocial behavior from age 6 to age 16 on offspring criminal offending were estimated. Results from the fourth logistic regression (Model 3D) indicated that antisocial behavior and change in antisocial behavior are significant predictors of criminal offending. Specifically, for each unit increase in antisocial behaviors, the odds of criminal offending increased by 1.7 (OR=1.70, 95%CI = 1.45, 1.01; $p < .01$). Also, for each unit increase in change in antisocial behavior, the odds of criminal offending increased by 1.13 (OR=1.01, 1.27; p = 0.04).

In order to test for moderation effects between parental monitoring and antisocial behavior on criminal offending, an additional multivariate regression was performed, which included parental monitoring, antisocial behavior, and an interaction term. Results indicated that there was no significant interaction between parental monitoring and child antisocial behavior (p. = 0.33).

Lastly, a multivariate logistic regression analysis was conducted to assess the main effects of the significant ACE and parenting practice predictors (i.e. child maltreatment, exposure to violence, and parental monitoring) on criminal offending while adjusting for antisocial behavior and change in antisocial behavior. Results (Model 3E) indicated that childhood exposure to violence significantly predicted criminal offending. For each unit increase in childhood exposure to violence, the odds of criminal offending increased by 1.4 (OR = 1.41, 95%CI=1.02, 1.93; p = 0.04). Child maltreatment and

parental monitoring were no longer significant predictors of criminal offending ($p. = 0.12$

and $p = 0.14$, respectively) when adjusting for antisocial behaviors. Final estimates from

the reduced model are located in Table 7.

V. Discussion

The purpose of this study was to evaluate the role of adverse childhood experiences in predicting parenting practices, offspring antisocial behavior, and later criminality. Since the literature has routinely linked 1) parenting practices with criminal offending and antisocial behavior; 2) antisocial behaviors with criminal offending, and 3) childhood adversity with parenting practices, antisocial behavior, and criminal offending this study aimed to provide evidence in support of the intergenerational transmission of violence.

This study aimed to assess 1) the effects of caregiver ACEs on offspring ACEs and parenting practices; 2) the effects of caregiver ACEs and parenting practices on offspring antisocial behavior, and 3) the intergenerational effects of ACEs, parenting practices, and antisocial behavior on subsequent criminal offending. Findings from this study are largely consistent with research linking childhood adversity to parenting practices, antisocial behavior, and criminal offending. The current findings suggest that these relationships are complex when assessed simultaneously.

Aim 1: Examine the Effects of Caregiver ACEs on Offspring ACEs and Parenting Practices

Caregiver Childhood Abuse Predicts Later Family Economic Hardship

When examining the effects of caregiver childhood abuse on offspring ACEs and parenting practices, findings indicated that caregiver history of abuse significantly predicts later economic hardship. While there is an abundance of evidence suggesting that childhood abuse is associated with increased risk for impaired psychological, behavioral, and social development (Greenfield, 2010), there is limited evidence to

support the link between caregiver history of childhood abuse and later economic

hardship.

Childhood maltreatment is a well-established "social determinant of health" in the

literature, and the Life Course perspective guides much of the research on the long-term

outcomes associated with child abuse (Greenfield, 2010). Under Life Course Model,

childhood maltreatment can influence future outcomes well into adulthood through

interconnected behavioral, social, and cognitive domains that affect physical and mental

health (Cicchetti & Toth, 1995; Settersten, 2003; Repetti, Taylor, & Seeman, 2002).

Results from this study provide evidence that childhood abuse also has the potential to

affect later economic stability, which generally aligns with other studies that suggest

early childhood victimization affects income trajectory (Fernandez et al., 2015).

Findings also support the work of Zielinski (2009) and Mullen et al. (1996) who

found direct associations between childhood abuse and adult socioeconomic well-being.

According to Zielinski (2009), victims of child maltreatment are at increased risk for

financial and employment-related difficulties. Since low socioeconomic status has been

identified as a salient risk factor for child abuse perpetration (Trickett, Aber, Carlson, &

Cichetti, 1991), results support a potential mechanism in the intergenerational

transmission of violence (Zielinski, 2009).

Caregiver Childhood Abuse Predicts Later Discipline Tactics

Findings also indicated that caregiver childhood abuse significantly predicted

discipline tactics, as caregivers with history of victimization were more likely to use

authoritative discipline tactics than permissive discipline tactics. Results also suggest that

caregivers with history of childhood were not significantly more likely to use harsh

discipline tactics. This finding is a direct contradiction to the work of other researchers, who suggest that survivors of childhood physical and/or sexual abuse may be more likely to be permissive parents or to use harsh discipline tactics (e.g. Bailey et al., 2012; Banyard, 1997; DiLillo & Damashek, 2003; Lyons-Ruth & Block, 1996). It is possible that the relationship between childhood abuse and later parenting is mediated by other factors, such as emotion dysregulation or beliefs about maternal efficacy (e.g. Smith, Cross, Winkler, Jovanovic, & Bradley, 2014; Michl, Handley, Rogosch, Cicchetti, & Toth, 2015).

Aim 2: Examine the Intergenerational Effects of ACEs and Parenting Practices on Antisocial Behavior

Caregiver and Offspring Childhood Adversity Predict Antisocial Behaviors

When assessing the initial intergenerational effects of ACEs on antisocial behavior, findings indicated that caregiver childhood abuse significantly predicted later antisocial behavior in children. This finding is consistent with the few studies that have cited maternal childhood abuse as a predictor of increased externalizing behaviors in offspring (e.g. Dubowitz et al., 2001; Myhre, Dyb, Wentzel-Larsen, Grogaard, & Thoresen, 2014). This finding further supports the intergenerational transmission of violence hypothesis by demonstrating that maternal adverse childhood experiences can predict delinquent and aggressive behavior in their children.

Among child-level adverse experience factors, this study revealed that child maltreatment, childhood exposure to violence, and family economic hardship were significantly associated with greater antisocial behavior. These findings are consistent with the general body of antisocial behavior literature, and further indicate that children's

externalizing behaviors are associated with environmental adversity (e.g. Anda et al., 2006). Longitudinal studies of childhood adversity and mental health have revealed that the cumulative effect of ACEs is significantly associated with antisocial behaviors (Schilling, Aseltine, & Gore, 2007), and some suggest cumulative childhood stress has a dose response relationship with aggression-related outcomes (Anda et al., 2006). In the present study, it is apparent that child exposure to maltreatment, violence, and family hardship each has unique effects on antisocial behavior.

Specifically, of all child-level ACEs, family economic hardship had the largest effect (i.e. explained the most variance in the antisocial behavior outcome). This finding is particularly interesting as preceding analyses indicated that caregiver history of childhood abuse significantly predicted later family economic hardship. Taken together, this may also provide additional evidence in support of the intergenerational transmission of violence hypothesis.

When examining these relationships while adjusting for parenting practices, however, a slightly different pattern emerged. Findings indicated that caregiver childhood abuse, child maltreatment, and family economic hardship remained significant predictors of child antisocial behavior, but the effects of exposure to violence were no longer significant. This was surprising considering the host of other studies asserting that exposure to violence directly affects maladaptive behaviors and interacts with other factors to elicit and amplify their effects (Dodge & Pettit, 2003). Results from the present study, however, might suggest that the association between childhood exposure to violence and antisocial behaviors is mediated by other factors such as parenting practices or family cohesion (e.g. Bacchini, Miranda, & Affuso (2011); Barr et al., 2011).

Parenting Practices and Antisocial Behaviors

When assessing the association between discipline tactics and antisocial behavior, findings indicated that children of caregivers who used harsh discipline tactics exhibited greater antisocial behaviors relative to children of parents who used permissive discipline tactics. This finding may be best interpreted using the Social Cognitive Theory (SCT).

Social Learning Theory evolved into SCT in 1986, and proposed that learning occurs in a social context through reciprocal and dynamic interactions that occur between the person, their environment, and their behavior (DiClemente, Crosby, & Kegler, 2010). Under SCT, behavior is learned via *observational learning,* which occurs by watching the behavior of peer models; *incentive motivation*, which refers to the use and misuse of rewards and punishments to modify behavior; and can be *facilitated* through tools, resources, or environments that make the behavior easier to perform (DiClemente, Crosby, & Kegler, 2010). Therefore, physical aggression from a primary caregiver may serve as a model of conflict resolution, normalizing physical punishment, and providing an environment that fosters other types of violent behavior (White & Straus, 1981). Furthermore, while corporal punishment and psychological aggression (i.e. harsh parenting tactics) are associated with immediate corrected behavior in children, it is also associated with more externalizing behaviors (Gershoff, 2002).

When adjusting for the effects of caregiver and offspring ACEs, however, results revealed that authoritative discipline tactics were associated with fewer antisocial behaviors relative to permissive discipline tactics. Results align with previous studies that have suggested nonviolent reasoning is associated with the prevention of future misbehavior (Larzelere, 1987). Moreover, studies have shown that discipline practices

that match the authoritative parenting typology are most preventive of later externalizing

behavior because parents focus on fostering situations that promote self-regulation and

minimize problem behavior (Dishion et al., 2008; Shaw, Bell, & Gilliom, 2000).

Surprisingly, parental monitoring was also associated with greater antisocial

behavior. This finding does not align with prior research suggesting higher parental

monitoring is a protective factor against antisocial behavior (e.g. Pettit, Laird, Dodge,

Bates, & Criss, 2001) and that low monitoring is associated with more antisocial behavior

(e.g. Ehrensaft et al., 2003). Still, parenting practices are believed to be bi-directional, as

studies have shown that child disruptive behaviors exert greater or equal influence on

parenting behaviors (Burke, Pardini, & Loeber, 2008). It is possible that these findings

are the result of residual confounding, a statistical artifact that makes corrective actions

by parents appear to increase children's antisocial behaviors due to child effects on

parents (Larzelere, Cox, & Smith, 2010).

Aim 3: Examine the Intergenerational Effects of ACEs, Parenting Practices, and Antisocial Behavior on Subsequent Criminal Offending

When assessing the final aim of this study, findings offered limited support for

intergenerational effects of childhood adversity on criminal offending. Overall, results

indicated that caregiver history of childhood abuse and discipline tactics were not

significant predictors of criminal offending. Higher parental monitoring, offspring

childhood maltreatment, and greater exposure to violence were initially predictors of

criminal offending. After adjusting for antisocial behaviors, however, parental monitoring

and offspring child maltreatment were no longer significant.

The initial relationship between higher parental monitoring and increased risk of criminal offending was surprising because previous studies suggest that there is a strong negative relationship between active monitoring and parental knowledge and criminal justice system involvement (Hoeve et al., 2009). It is possible that this association was artifact of increased monitoring among offenders with higher antisocial behaviors.

Change in antisocial behaviors also significantly predicted criminal offending, as increases in the antisocial behavior change score increased the odds of criminal offending. This supports the notion that it is possible to predict criminal offending using antisocial behavior scores from very early in life, which broadly aligns with work of Loeber (1991) who suggests that the malleability of child behaviors decreases as children grow older, and with the work of Moffit (2006) who asserts that the antisocial behaviors of those in the *life-course persistent* subtype are enduring. Findings suggest that it may be of chief importance to identify children who engage more antisocial behaviors during early childhood and intervene in order to alter the pathway to criminality.

In the final model, when considering all caregiver-level and child-level factors, childhood exposure to violence, antisocial behavior, and change in antisocial behavior were salient predictors of criminal offending. This finding bolsters the work of Eitle and Turner (2002), who found that recently witnessed community-based violence (past year) was significantly associated with young adult criminal behavior by indicating that exposure to violence during adolescence may also play a role in later offending. It is possible that exposure to certain kinds of violent acts (e.g. witnessing murder or assault) have unique effects on later crime perpetration, which may be of interest to researchers in the future.

Conclusion

In summary, findings from this study offered mixed support for the initial conceptual framework (Figure 2). Caregiver history of maltreatment predicted later family hardship, parenting practices, and antisocial behaviors; childhood adversity and parenting practices were associated with antisocial behavior; and childhood exposure to violence and antisocial behaviors predicted later criminal offending (see Figure 4). Results may allude to distal associations when assessing the intergenerational effects of adverse childhood experiences on criminal offending, but it is clear that the primary point of intervention may be to increase effective parenting practices. Discipline tactics that mirror an authoritative style appear to reduce child antisocial behavior, and may potentially mitigate the effects of these behaviors and exposure to violence on later criminal offending.

Study Limitations

While findings are revealing, there are several limitations that must be considered when interpreting the results. First, despite the level of confidence participants may feel during an intimate face-to-face interview, self-report data is still subject to social desirability bias (Furnham, 1986). It is possible that participants answered survey questions in a manner consistent with what is deemed socially or morally acceptable instead of reporting actual beliefs or behaviors. Therefore, some individuals may have over- or under-reported certain experiences or practices. Secondly, though analyses were performed on a moderate sample size, participants in this study may not be a true representation of youth in the general population, since all participants were intentionally sampled to represent varying levels of risk for child-maltreatment.

Additionally, data on various parenting practices were averaged across each time point during adolescence. According to Sampson and Laub's (2005) *age-graded theory*, the relationship between parenting and delinquency changes with time. Data regarding parental monitoring and discipline tactics were collected at age 12, 14, and 16, and though these data could be used to predict criminal offending at age 18, data on selected parenting practices were not available at earlier time points to effectively predict antisocial behavior. It is also important to note that parents realistically use multiple forms of discipline, which means it is difficult to pinpoint discrete effects between discipline categories. Previous studies have also shown that pre-adolescent antisocial behaviors have substantial and concurrent negative effects on the quality of parental discipline. Parenting practices might somehow be involved in maintaining the stability of antisocial behaviors (Vuchinich, Bank, & Patterson, 1992).

Furthermore, findings should be interpreted with caution. Study variables had small to medium effects, and all models explained a limited amount of variance in study outcomes (~4% to ~16%). This indicates that there are many other factors that must be taken into consideration when studying antisocial behaviors and criminal offending. It is also important to note that recent studies have suggested ACEs may have differential impact on outcomes of interest (Schilling, Aseltine, & Gore, 2008). Abuse and maltreatment variables in the current study were dichotomized to assess odd ratios, but it would be useful to examine adversity measures in a continuous manner to gain insight on potentially nonlinear relationships. Future studies should consider the severity of experiences such as abuse and neglect, in order to identify potential risk thresholds for negative outcomes. Finally, in order to truly assess the intergenerational effects of ACEs on study outcomes, more powerful statistical

techniques are needed, such as structural equation modeling, which would allow further exploration of the complex mediational relationships that are evident here.

Implications and Recommendations

Future studies in this area should pay special attention to reactive and instrumental parenting over time in order to determine best practices for overcoming negative environmental influences. It would also be of interest to assess effects prospectively using genetically sensitive designs. Researchers could then, for example, examine rates of discordance among twins who were adopted and raised within their biological families to clearly examine genetic and environmental influences.

Moreover, while research has demonstrated that children's problem behavior can provoke harsh discipline from adults (Jaffe et al., 2007), it is also likely that parent behaviors have genetic influences, as individuals differ in their reactivity to the environment (Kendler & Baker, 2007). Caregiver history of victimization could have effects that impact later reactivity to child disruptive behavior (Roth, Lubin, Funk, & Sweatt, 2009). Since there is a two-way interplay between individuals and their environment, it is important to acknowledge these interactions in the study of the intergenerational effects of adverse childhood experiences on parenting practices and offspring behavior.

By examining these data and their conclusions, health scientists can devise innovative and targeted behavioral modification programs. Further consideration of genetic, community, and interpersonal relationships will clarify the extent to which these influences can explain the development of antisocial behavior and criminality.

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Table 1. Study Child Characteristics

	All Participants	Offenders	Non-Offenders
	N = 902	n = 188	n = 714
	N (%)	n (%)	n (%)
Child Sex			
Male	344 (43.82)	104 (63.03)	240 (38.71)
Female	441 (56.18)	61 (36.87)	380 (61.29)
Child Race/Ethnicity			
Black	436 (55.61)	79 (47.88)	357 (57.67)
White	206 (26.28)	43 (26.06)	163 (26.33)
Hispanic	54 (6.89)	19 (11.52)	35 (5.65)
Other	88 (11.22)	24 14.55)	64 (10.34)
Antisocial Behavior			
Average Antisocial Behavior Raw Score, M (SD)	11.84 (7.52)	15.50 (8.51)	10.88 (6.93)
Average Change in Antisocial Behavior, M (SD)	-2.24 (10.17)	-0.19 (12.73)	-2.74 (9.38)
Adverse Childhood Experiences			
Child Maltreatment			
Yes	467 (51.77)	111 (59.04)	356 (49.86)
No	435 (48.23)	77 (40.04)	358 (50.14)
Ever Sexually Abused	141 (15.63)	32 (17.02)	109 (15.27)
Ever Physically Abused	259 (28.71)	75 (39.89)	184 (25.77)
Ever Psychologically Abused	384 (42.57)	91 (48.40)	293 (41.04)
Ever Neglected	110 (12.20)	25 (13.30)	85 (11.90)
Average Exposure to Violence			
1 to 5 acts	577 (82.66)	114 (76.00)	463 (84.59)
6 to 10 acts	108 (15.47)	31 (20.67)	77 (14.05)
Greater than 10 acts	13 (1.86)	5 (3.33)	8 (1.46)
Average Family Economic Hardship, M (SD)	2.18 (2.36)	2.39 (2.42)	2.12 (2.34)

Table 2. Primary Maternal Caregiver Characteristics

	All Participants N = 902 N (%)	Offenders n = 188 n (%)	Non-Offenders n = 714 n (%)
Race/Ethnicity			
Black	434 (55.64)	86 (50.59)	348 (57.05)
White	244 (31.28)	52 (30.59)	192 (31.48)
Hispanic	59 (7.56)	22 (12.94)	37 (6.07)
Other	43 (5.51)	10 (5.88)	33 (5.41)
Marital Status			
Married	253 (34.75)	38 (24.36)	215 (37.59)
Single, Never Married	292 (40.11)	71 (45.51)	221 (38.64)
Divorced, Separated, or Widowed	183 (25.14)	47 (30.13)	136 (23.78)
Education			
Some High School or Less	267 (36.78)	59 (22.10)	208 (77.90)
High School Graduate	233 (32.09)	54 (23.18)	179 (76.82)
Some College or Higher	226 (31.13)	42 (18.58)	184 (81.42)
Employment Status			
Employed	420 (57.77)	65 (41.67)	242 (42.38)
Unemployed	307 (42.23)	91 (58.33)	329 (57.62)
Family Income			
Less than $24,999	517 (72.01)	125 (82.24)	392 (69.26)
Greater than $25,000	201 (27.99)	27 (17.76)	174 (30.74)
Childhood Abuse			
Yes	297 (32.93)	75 (39.89)	222 (31.09)
No	605 (67.07)	113 (60.11)	492 (68.91)
Ever Sexually Abused	217 (24.06)	52 (27.66)	165 (23.11)
Ever Physically Abused	209 (23.17)	56 (29.79)	153 (21.43)
Primary Discipline Tactic			
Permissive Parenting Tactics	262 (29.05)	63 (33.52)	199 (27.87)
Authoritative Discipline Tactics	385 (42.68)	69 (36.70)	316 (44.26)
Harsh Parenting Tactics	255 (28.27)	56 (29.79)	199 (27.87)
Average Parental Monitoring, M (SD)	1.77 (0.26)	1.71 (0.28)	1.79 (0.26)

Table 3. Summary of Statistical Analyses

Predictor (s)	Outcome	Type of Analysis	Model Number
Aim 1: Examine Effects of Caregiver ACEs on Offspring ACEs and Parenting Practices			
Caregiver Childhood Abuse	**Step 1**		
	Offspring Exposure to Violence	Multiple Linear Regression	1A
	Family Economic Hardship	Multiple Linear Regression	1B
	Child Maltreatment	Multiple Logistic Regression	1C
	Step 2		
	Discipline Tactics	Multinomial Logistic Regression	1D
	Parental Monitoring	Multiple Linear Regression	1E
Aim 2: Examine Intergenerational Effects of ACEs and Parenting Practices on Antisocial Behavior			
	Step 1		
Caregiver Childhood Abuse	Offspring Antisocial Behavior	Multiple Linear Regression	2A
	Step 2		
Offspring Exposure to Violence			2B
Family Economic Hardship	Offspring Antisocial Behavior	Multiple Linear Regression	
Child Maltreatment			
	Step 3		
Discipline Tactics			2C
Parental Monitoring	Offspring Antisocial Behavior	Multiple Linear Regression	
	Step 4		
Caregiver Childhood Abuse			2D
Offspring Exposure to Violence	Offspring Antisocial Behavior	Multiple Linear Regression	
Family Economic Hardship			

Child Maltreatment			
Discipline Tactics			
Parental Monitoring			
Aim 3: Examine Intergenerational Effects of ACEs, Parenting Practices, and Antisocial Behavior on Criminal Offending			
	Step 1		
Caregiver Childhood Abuse	Offspring Criminal Offending	Multiple Logistic Regression	3A
	Step 2		
Offspring Exposure to Violence	Offspring Criminal Offending	Multiple Logistic Regression	3B
Family Economic Hardship			
Child Maltreatment			
	Step 3		
Discipline Tactics	Offspring Criminal Offending	Multiple Logistic Regression	3C
Parental Monitoring			
	Step 4		
Offspring Antisocial Behavior	Offspring Criminal Offending	Multiple Logistic Regression	3D
Offspring Change in Antisocial Behavior			
	Step 5		
Child Maltreatment	Offspring Criminal Offending	Multiple Logistic Regression	3E
Offspring Exposure to Violence			
Parental Monitoring			
Offspring Antisocial Behavior			
Offspring Change in Antisocial Behavior			

Table 4. Multinomial Logistic Regression Results[*] Examining the Effects Caregiver Childhood Abuse on Discipline Tactics

	Discipline Tactic[†]				
	Use of Authoritative Discipline Tactics	**p-value**	**Use of Harsh Discipline Tactics**	**p-value**	
	OR (95%CI for Exp β)		OR (95%CI for Exp β)		
Race/Ethnicity					
Black	0.23 (0.16 - 2.11)	0.15	0.24 (0.18 - 1.75)	0.18	
Hispanic	**-1.02 (0.27-14.5)**	**<0.001**	-0.44 (0.27 - 2.59)	0.11	
Other	0.41 (0.29 - 2.01)	0.16	-0.14 (0.36 - 0.16)	0.70	
White	REF	.	REF	.	
Income					
Less than $24,999	**0.37 (0.24 - 0.57)**	**<0.001**	0.70 (0.44 - 1.13)	0.15	
Greater than $25,000	REF	.	REF	.	
Caregiver Childhood Abuse					
Yes	**1.46 (1.00 - 2.12)**	**0.04**	1.15 (0.79-1.68)	0.45	
No	REF	.	REF	.	

[*] Values presented in bolded text are significant at $p < 0.05$.
[†] Permissive Discipline Tactics is the referent group.

Table 5. Multiple Linear Regression Results[‡] Examining the Intergenerational Effects of ACEs and Parenting Practices on Antisocial Behavior

	Model 2A (R2 = 0.03)				Model 2B (R2 = 0.08)				Model 2C (R2=0.11)				Model 2D (R2 = 0.16)			
	ηp2	*b*	SE	p-value	ηp2	*b*	SE	p-value	ηp2	*b*	SE	p-value	ηp2	*b*	SE	p-value
Socio-demographic Control Variables													0.004			
Offspring Sex	0.004				0.005				0.00							
Male		0.12	0.08	0.09		0.15	0.07	0.42		0.11	0.07	0.10		0.12	0.07	0.10
Female		REF	.	.		REF	.	.		REF	.	.		REF	.	.
Offspring Race/Ethnicity	**0.01**				**0.014**				**0.02**				**0.019**			
Black		**-0.21**	**0.09**	**0.03**		**-0.28**	**0.09**	**0.002**		**-0.30**	**0.09**	**0.001**		**-0.28**	**0.09**	**0.002**
Hispanic		-0.21	0.17	0.21		-0.25	0.16	0.12		**-0.33**	**0.16**	**0.04**		-0.29	0.16	0.06
Other		0.13	0.14	0.33		0.12	0.13	0.38		0.10	0.13	0.43		0.13	0.13	0.31
White		REF	.	.		REF	.	.		REF	.	.		REF	.	**.**
Income	0.002				0.001				0.001				0.0			
Less than $24,999		-0.11	0.09	0.23		-0.06	0.09	0.48		-0.08	0.09	0.38		0.001	0.0869	0.99
Greater than $25,000		REF	.	.		REF	.	.		REF	.	.		REF	.	.
Caregiver ACEs																
Caregiver Childhood Abuse	**0.014**												**0.010**			
Yes		**0.23**	**0.08**	**0.003**										**0.22**	**0.07**	**0.003**
No		REF	.	.										REF	.	
Offspring ACEs																
Offspring Exposure to Violence					0.005	0.14	0.07	0.04					0.006	0.11	0.07	0.10
Family Economic Hardship					0.027	0.22	0.04	<.0001					0.027	**0.18**	**0.04**	**<0.001**
Child Maltreatment					0.024								0.024			
Yes						0.30	0.07	<0.001						**0.30**	**0.07**	**<0.001**
No						REF	.							REF	.	.
Parenting Practices																
Discipline Tactics									0.02				0.025			
Authoritative Discipline Tactics										0.16	0.09	0.56		**-0.22**	**0.08**	**0.01**
Harsh Discipline Tactics										**0.19**	**0.09**	**0.04**		0.16	0.09	0.08
Permissive Discipline Tactics										REF	.			REF	.	.
Parental Monitoring									0.06	**0.65**	**0.08**	**<0.001**	0.049	**0.58**	**0.08**	**<0.001**

[‡] Values presented in bolded text are significant at *p* < 0.05

Table 6. Multiple Logistic Regression Results Examining the Intergenerational Effects of ACEs, Parenting Practices, and Antisocial Behavior on Criminal Offending

	Model 3A		Model 3B		Model 3C		Model 3D	
	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value	OR (95%CI)	p-value
Socio-demographic Control Variables								
Offspring Sex								
Male	2.49 (1.78 - 3.45)	<0.001	2.56 (1.85 - 3.63)	<0.001	2.55 (1.82 - 3.58)	<0.001	2.53 (1.79 - 3.58)	<0.001
Female	REF	.	REF	.	REF	.	REF	.
Offspring Race/Ethnicity								
Black	0.79 (0.51 - 1.21)	0.001	0.68 (0.44 - 1.05)	0.0002	0.69 (0.45 - 1.06)	0.001	0.85 (0.55 - 1.32)	0.005
Hispanic	2.18 (1.10- 4.33)	0.02	2.0 (1.10 - 3.97)	0.02	1.84 (0.91 - 3.70)	0.045	2.59 (1.28 - 5.25)	0.01
Other	1.37 (0.75 - 2.50)	0.63	1.33 (0.73 - 2.44)	0.51	1.26 (0.68 - 2.31)	0.59	1.26 (0.68 - 2.34)	0.91
White	REF	.	REF	.	REF	.	REF	.
Family Income								
Less than $24,999	2.31 (1.44 - 3.70)	0.001	2.3 (1.43 - 3.73)	0.001	2.30 (1.42 - 3.73)	0.001	2.31 (1.42-3.78)	0.001
Greater than $25,000	REF	.	REF	.	REF	.	REF	.
Caregiver ACEs								
Caregiver Childhood Abuse	1.35 (0.95 - 1.91)	0.09						
Offspring ACEs								
Offspring Exposure to Violence			1.54 (1.13 - 2.10)	0.007				
Family Economic Hardship			1.06 (0.86 - 1.31)	0.58				
Child Maltreatment								
Yes			1.51 (1.07 - 2.13)	0.02				
No			REF					
Parenting Practices								
Discipline Tactics								
Authoritative Discipline Tactics					0.80 (0.53 - 1.21)	0.32		
Harsh Discipline Tactics					0.91 (0.59 - 1.41)	0.90		
Permissive Discipline Tactics					REF			
Parental Monitoring					1.96 (1.36 - 2.83)	0.0003		
Antisocial Behavior								
Offspring Antisocial Behavior							1.74 (1.45 - 2.01)	< .001
Offspring Change in Antisocial Behavior							1.13 (1.01 - 1.27)	0.04

Table 7. Multiple Logistic Regression Results Examining the Effects of Child Maltreatment, Exposure to Violence, Parental Monitoring and Antisocial Behavior on Criminal Offending

	Model 3E		Model 3E - Reduced	
	OR (95%CI)	p-value	OR (95%CI)	p-value
Socio-demographic Control Variables				
Offspring Sex				
Male	**2.56 (1.82 - 3.67)**	**<0.001**	**2.53 (1.79 - 3.59)**	**<0.001**
Female	REF	.	REF	.
Offspring Race/Ethnicity				
Black	**0.75 (0.48 - 1.89)**	**0.001**	**0.78 (0.50 - 1.22)**	**0.002**
Hispanic	**2.38 (1.17 - 4.88)**	**0.01**	**2.44 (1.20 -4.95)**	**0.01**
Other	1.26 (0.67 - 2.35)	0.91	1.22 (0.66 - 2.28)	0.96
White	REF	.	REF	.
Family Income				
Less than $24,999	**2.32 (1.42 - 3.79)**	**0.001**	**2.26 (1.39 - 3.69)**	**0.001**
Greater than $25,000	REF	.	REF	.
Child ACEs				
Child Maltreatment				
Yes	1.32 (0.923 - 1.89)	0.13		
No	REF			
Offspring Exposure to Violence	**1.41 (1.02 - 1.93)**	**0.04**	**1.47 (1.08 - 2.03)**	**0.02**

Parenting Practice

Parental Monitoring	1.35 (0.91 - 2.00)	0.14		

Antisocial Behavior

Offspring Antisocial Behavior	**1.59 (1.34 - 1.89)**	**< 0.001**	**1.67 (1.41 - 1.96)**	**< 0.001**
Offspring Change in Antisocial Behavior	1.11 (0.99 - 1.25)	0.07	**1.13 (1.01 - 1.27)**	**0.04**

Figure 1. Life Course Model: The Relationship of Person, Environment, Time (Hutchinson, 2008)
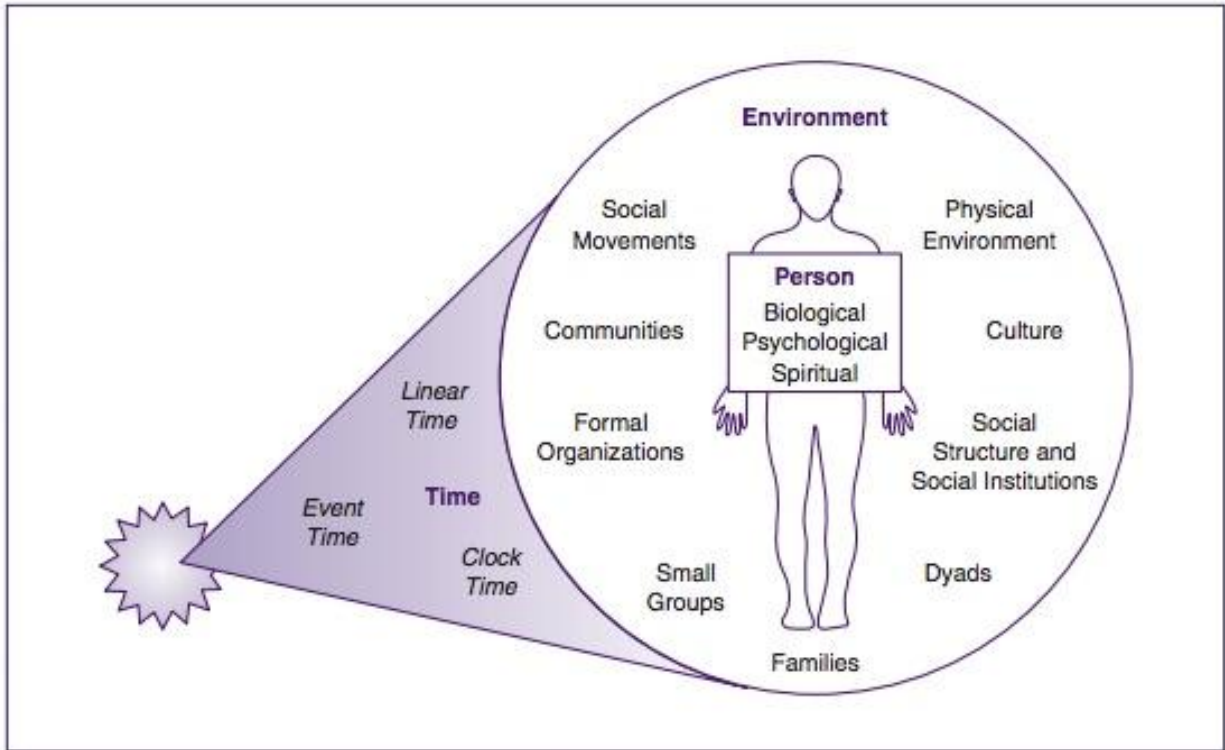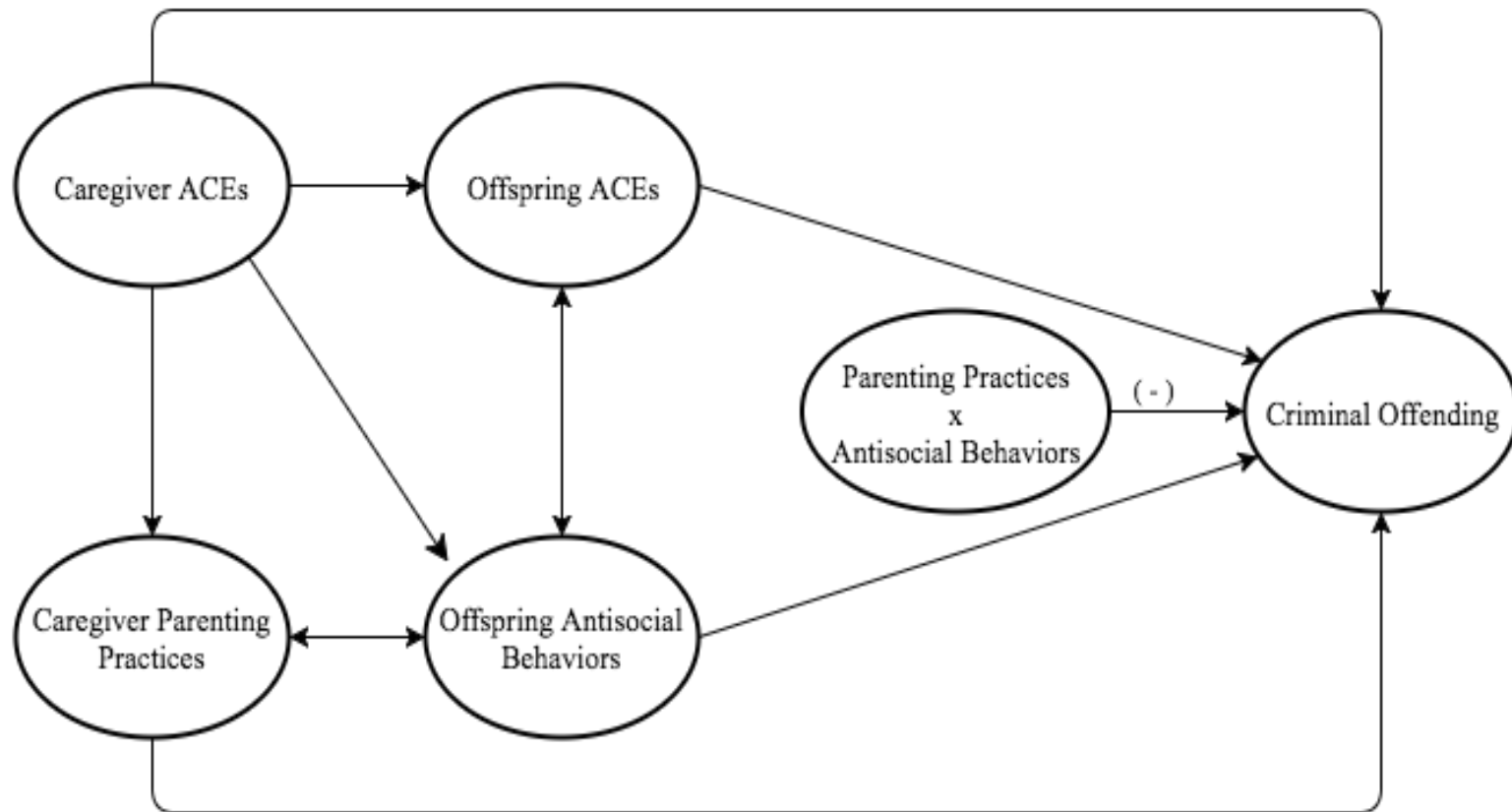
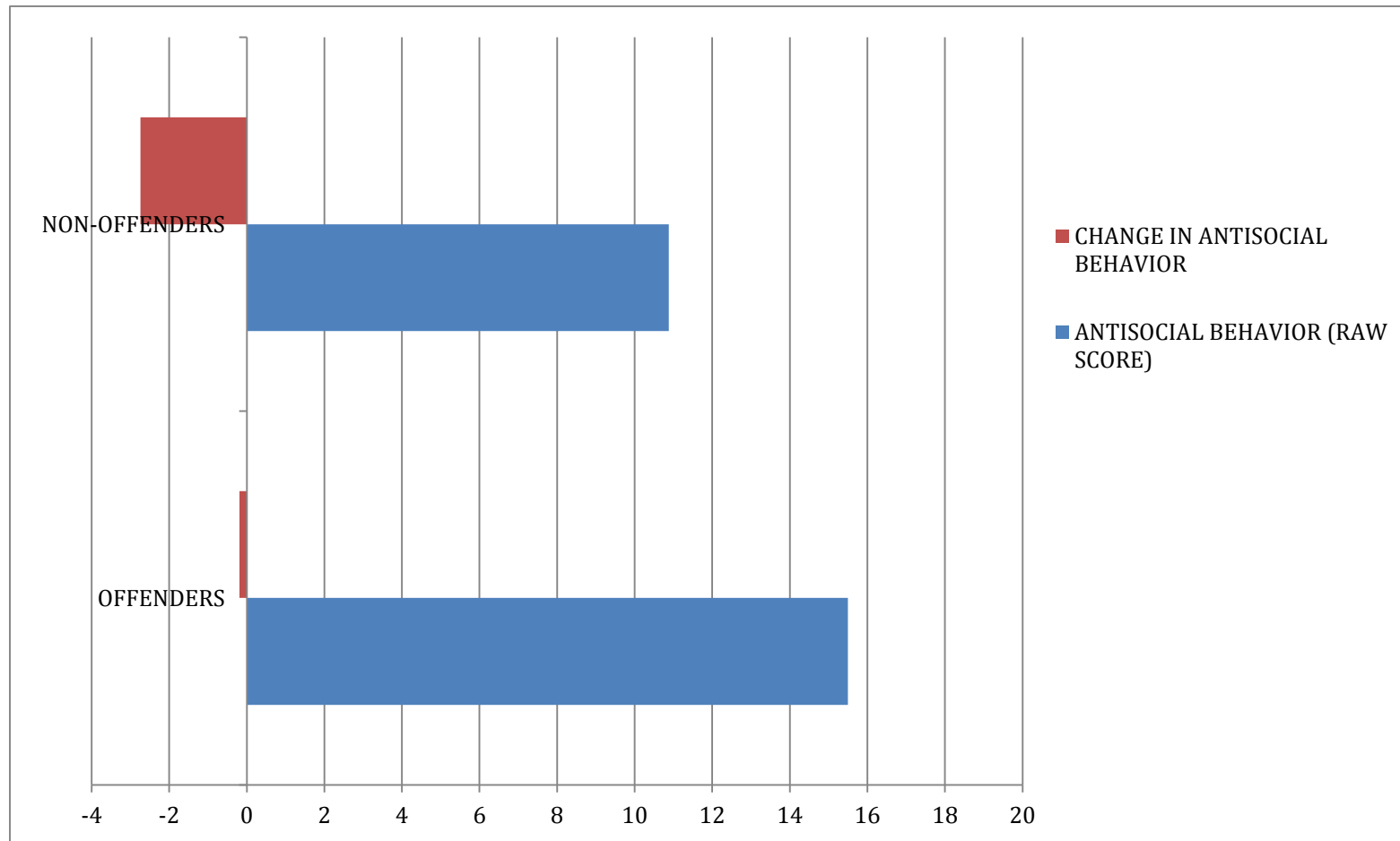**Figure 2. Conceptual Framework**

Figure 3. Change in Antisocial Behavior by Offender Status

Figure 4. Revised Conceptual Framework