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## Adult criminal involvement: A cross-sectional inquiry into correlates and mechanisms over the life course

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### Abstract

In this paper, we examine the relative contribution of four domains of predictors that have been linked to adult criminal involvement: (1) socio-demographic characteristics, (2) family-of-origin factors, (3) proximal processes developed during adolescence, and (4) current lifestyle and situational factors. Cross-sectional data were collected through face-to-face interviews with 242 community-recruited adults. Data analysis involved negative binomial regression. Being male, family size, juvenile delinquency, aggression, living with someone involved in illegal activity and recent violent victimization were independently associated with non-violent criminal involvement. Aggression, association with deviant peers, and recent violent victimization were independently associated with violent criminal involvement. Juvenile delinquency and aggression mediated the affect of multiple family-of-origin characteristics on non-violent criminal involvement and aggression mediated the effect of childhood physical abuse on violent criminal involvement. The results emphasize the importance of investigating both antecedents and proximal risk factors predictive of different types of criminal involvement, which, in turn, will assist in developing risk-focused prevention and intervention programs.

### INTRODUCTION

The link between adult criminal involvement and social disadvantage has been widely explored (Fergusson, Swain-Campbell, & Norwood, 2004). Specifically, the role of poverty (Conger et al., 1992), low social capital (Farrington, 1990; Sampson & Laub, 1993), limited opportunities for upward social mobility (Merton, 1938; Agnew, 1999, 2005), and neighborhood disorder (Stewart, Simons, & Conger, 2002; Stewart & Simons, 2006; Warner, 2003) have been examined. Researchers also have shown that adult criminal involvement is linked to cumulative disadvantage over the course of one's life (Caspi, 1998; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996; Fergusson et al., 2004; South & Messner, 2000). Moreover, being exposed to adult criminal involvement as a means to gain social status teaches the younger generation it is an acceptable behavior. Shaw and McKay (1969) were among the first to highlight such positive reinforcement.

Others have cautioned against directly connecting pre-adult social disadvantage to adult criminal involvement and recommend consideration of mediating factors at the individual, familial and peer level (Ferguson, Swain-Campbell & Norwood, 2004). This study builds on this recommendation by expanding on the ecological model (Bronfenbrenner, 1979) and the life course perspective (Sampson & Laub, 1992). The ecological model provides a means of organizing potential contextual factors based on proximity to the individual. It encompasses a set of nested systems that range from the micro (e.g., socio-demographic characteristics) to

the meso (e.g., familial) and, ultimately, the macro level (e.g., health care policies) over the life course. Each level contributes to the pathway to adult criminal behavior. A complimentary viewpoint for a study of adult criminal behavior that takes into account childhood and adolescent experiences is the life course perspective (Sampson & Laub, 1992). In his later work, Bronfenbrenner (1986) incorporated life course theory. The role of time was further woven into an extension of the ecological model as repeated interactions in a child's proximate environment called "proximal processes" (Bronfenbrenner, 1999, p. 5). Such processes affect a developing child and are influenced by the child and their environment over time. Therefore, the processes a person undergoes are considered in conjunction with the person's individual characteristics as well as the context in which the person lives, over time. The integration of an ecological model and a life course paradigm allows for an inquiry into adult criminal involvement that considers individual, familial, peer, and current factors (Bronfenbrenner, 1986; 1999; Sampson & Laub, 1992).

### **Socio-demographic Characteristics**

Focusing on the context of individual daily lives allows for insights into the complex set of factors associated with adult criminal involvement (Theall, Elifson, Sterk, & Stewart, 2007; Sampson & Laub, 2005; Stewart, Elifson, & Sterk, 2004). For example, racial differences in offending and subsequent criminal justice involvement have been linked with conditions characteristic of segregated inner-city neighborhoods such as limited employment options, an active underground economy, relatively high levels of violence, and low social control (Sampson & Laub, 1992, 1993, 2005; Sampson & Wilson, 1995). Gender differences in criminal involvement have also been linked to broader contextual factors such as gender role expectations. The latter often are presented as an explanation for more criminal involvement among men than women (Alarid, Burton, & Cullen, 2000).

### **Family of Origin**

Family-of-origin characteristics provide a historical context in which to place one's current life. In Bronfenbrenner's model (1999) the family is placed one level beyond the individual in the meso-system. Adult criminal involvement has been associated with a number of factors that fall into the meso-system of familial influences such as adverse childhood experiences, including negative childhood learning experiences, inadequate social bonding, parental neglect, and a lack of family cohesion (Farrington, Barnes, & Lambert, 1996; Hoffmann, 2003; Kierkus & Baer, 2002; Sorenson & Brownfield, 1995). In addition to these processes, family characteristics such as family size also have been linked to adult criminal involvement (Argys, Rees, Averett, & Witoonchart, 2006; Barrett & Turner, 2006; Reinhertz, Giacconia, Hauf, Wasserman, & Paradis, 2000; Sampson & Laub, 1993).

### **Proximal Processes during Childhood and Adolescence**

Juvenile delinquency has previous associations with adult criminality (Eggleston & Laub, 2002; McCord, 1991). Childhood aggression has also been found to predict the odds of arrests, a proxy for criminal involvement, among men by the time they turn thirty (Huesmann, Eron, & Dubow, 2002). Being involved with crimes as a juvenile or displaying aggressive behavior toward other children during childhood and adolescence seem representative of repeated interactions that are associated with later criminal behavior.

### **Current Contextual and Situational Factors**

In recent years, the role of current contextual and situational characteristics versus predisposing developmental risk factors in explaining adult criminal involvement has become a topic of debate (Beauregard, Lussier, & Proulx, 2007). For example, scholars began investigating whether community characteristics, such as neighborhood disorder and a

violent street culture, yielded higher rates of criminal involvement and violent behavior among certain populations (Stewart, Simons, & Conger, 2002; Stewart & Simons, 2006). Similarly, the work of Warner (2003) examined the association between cultural strength and informal social control and found that although the two were related, the latter was still impacted by larger forces. This perspective is in keeping with Bronfenbrenner's (1999) postulation that proximal processes must be distinguished from the context in which they occur, while also recognizing that these vary as a function of this context. Therefore, when exploring criminal involvement it is important to examine the context as well a person's daily routine (Cohen & Felson, 1979). Current contextual and situational factors that have been associated with adult criminal involvement include illicit drug use, association with deviant peers, and environmental stressors, such as victimization and neighborhood disorder (Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996; Sterk, 1999; Stewart et al., 2004; Theall et al., 2007).

### **Potential Mechanisms**

It also is important to consider the potential mechanisms that, over time, affect the likelihood of adult criminal involvement. Family-of-origin characteristics (e.g., parent-child interaction and parental criminal involvement) have been shown to be associated with criminal behavior among the offspring (Farrington, Gundry, & West, 1975; McCord, 1991). However, when aggressiveness in childhood was included in a multivariate model of parental influence on adult criminal behavior, the majority of previously significant bivariate associations between parental influence and adult criminal behavior became non-significant (Huesmann et al., 2002). Parental influence was also associated with childhood aggression and it may be posited within the ecological model (Bronfenbrenner, 1999) as a meso-system feature that creates a backdrop for a proximal process (e.g., aggression) linked to adult criminal involvement. Considering the meso-system characteristics, proximal processes forged in adolescence and current contextual and situational factors provide a means of comparing the relative influence of these domains.

### **The Current Study**

In this paper, data are presented from a cross-sectional study to examine the joint effects of socio-demographic characteristics, family-of-origin characteristics, proximal processes defined in Bronfenbrenner's (1999) ecological model, and current lifestyle and situational factors on adult criminal involvement. The goal is to disentangle the relative influence of these domains on adult criminal involvement. Additionally, the proximal processes of juvenile delinquency and aggression were investigated as mediators of the association between family-of-origin characteristics and adult criminal involvement.

First, we examine what influence family-of-origin characteristics have on adult criminal involvement relative to proximal processes (juvenile delinquency and aggression) and current contextual and situational characteristics. Second, we investigate whether the two proximal processes, juvenile delinquency and aggression, mediate the effect of family-of-origin characteristics on adult criminal involvement.

## **METHODS**

### **Study Procedures**

The data presented in this paper are part of Project Target, a study on intergenerational dynamics. In this paper the focus is on adult criminal involvement among a sample of 242 adults. Data were collected between September 2002 and August 2006 in Atlanta, Georgia. The study area from which the respondents were recruited was typical of many impoverished U.S. inner-city neighborhoods that are racially segregated and have high

unemployment and crime rates, low levels of education, and overcrowded housing (see for example, Sampson & Raudenbush, 2004; Sterk, Elifson, & Theall, 2007). To be eligible for inclusion in the study, the respondents had to be at least 18 years of age at the time of the interview and reside in one of the study areas. The main exclusion criteria were the inability to conduct the interview in English and being housed in an institutional setting (e.g., prison/jail or drug treatment) at the time of the interview. Research has shown such institutional involvement to result in biased reporting on external conditions such as neighborhood effects and life prior to institutionalization. As is common in community-based studies that target hidden populations, the initial recruitment phase was driven by ethnographic mapping and windshield surveys (Tashima, Crain, O'Reilly, & Sterk-Elifson, 1996). Targeted sampling was complemented with chain referral sampling (Strauss & Corbin, 1998). The mix of sampling strategies has been shown to be effective in community-based studies for the recruitment of respondents from a wide range of settings to ensure representativeness of the sample (Sterk, 1999). The field staff was given alternative instructions on sites and types of respondents as additional information emerged. Less than three percent of the eligible respondents declined participation, most often due to lack of ability to commit the time required for an interview. Those who declined participation did not differ from those who enrolled in terms of recruitment location, area of residence, or key demographic characteristics. The field staff included two men and one woman with one of the men and the woman being African American. The other male staff interviewer was white. This team was supplemented with four graduate students who worked part-time, with an equal number of men and women and three of the four being white. One of the male graduate students was African American. All interviewers received extensive training that covered interviewing in general, questionnaire-based interviewing, and interviewing specific to the project.

Data collection involved computer-assisted, structured interviews. The average length of time to complete the interviews was approximately two hours (range from 1 to 3.5 hours). Respondents were reimbursed \$25 for their participation. Interviews were conducted in one of the project office locations at the university (approximately two-thirds of the interviews) or at a location that was more convenient for the respondent such as the respondent's home, or a local community based organization. We did not identify any differences in the data collected across interview setting. The Institutional Review Boards at Georgia State University and at Emory University approved the informed consent procedures.

## Measures

Data were collected using an instrument developed specifically for the study during the formative phase (see for example, Elifson, Klein, & Sterk, 2006; Klein, Elifson, & Sterk, 2003; Theall, Elifson, Sterk, & Klein, 2003). The instrument included several established scales, as referenced in the text below, as well as items drawn from instruments shown to produce both valid and reliable results from drug users such as the risk behavior assessment (RBA), the Addiction Severity Index (ASI), and the DSM-IV partial substance abuse module (SAM) (Coyle, 1998; McLellan et al., 1985). These measures, which are based on self-reports exhibit excellent face validity and nearly all have good internal consistency, as indicated below.

**Dependent Variable—*Adult criminal involvement***, was categorized into two dependent variables for the current study using items derived from the Crime and Violence Scale (Conrad, Riley, Conrad, Chan, & Dennis, 2010). *Non-violent crimes* included eight items: driving under the influence, stealing property from a store, stealing property from somewhere other than a store, destroying property, passing bad checks or forging prescriptions, breaking into a house or building, selling, distributing, or helping to make drugs and taking someone else's car. The scale demonstrated marginal reliability ( $KR_{20}^1 = .$

69). *Violent crimes* included physical assault with or without a weapon, use of a knife or a gun to get something from someone, setting a fire and hurting someone badly enough that they needed medical treatment. The scale demonstrated satisfactory reliability ( $KR_{20}^1 = .75$ ). Higher scores represented greater criminal involvement for both scales. We limited criminal activity to the past year to ensure that respondents would be able to recall their criminal involvement.<sup>2</sup>

**Independent Variables**—The independent variables cover four domains: (1) socio-demographic characteristics; (2) family-of- origin factors; (3) proximal processes; and (4) current lifestyle and situational factors.

**Socio-demographic characteristics**—These variables included *gender*, *age* (in years), *racial background* (white/non-white), *education* (years in school), *employment status* (employed in legal job at least part-time), *relationship status* (cohabiting/not cohabiting), and whether the respondent had any *children* (yes/no).

**Family-of-origin characteristics**—*Family size* was measured using the reported number of siblings for each respondent (1/>1) to indicate if there were more than two children in their family growing up. *Family structure* was defined based on the number of biological parents (0/1) living in the home when the respondent was growing up. *Maternal drug use* was assessed by asking the respondents if they knew their mother had a drug problem while they were growing up (yes/no). Due to large amounts of missing data on fathers, we limit parental drug use to that among mothers.<sup>3</sup> Measures of *sexual abuse*, *physical abuse* and *parental neglect* were derived from the Childhood Trauma Questionnaire (Bernstein et al., 1994). These items were scored as “never true,” “rarely true,” “sometimes true,” “often true,” or “very true.” *Sexual abuse* was measured using four items, including the perception of being touched in a sexual way or made to touch someone else, threatened unless they did something sexual, made to do or watch sexual things and being molested while growing up (Cronbach’s alpha = .95). This variable was collapsed to never and ever (0/1) due to lack of normality. *Physical abuse* was measured using four items, including the perception of being physically abused, being hit so badly it was noticed by somebody like a teacher, neighbor, or doctor, getting hit so hard by a family member that the injury required medical care, and receiving marks or bruises from a family member (alpha = 0.72). Higher scores indicated more physical abuse. We used five items to measure *parental neglect*, including not having enough to eat, parents too drunk or high to take care of the family, having to wear dirty clothes, lack of adequate medical care, and an overall lack of parental care and protection (alpha = 0.76). Higher scores indicated more parental abuse. *Perceived family cohesion* was measured using eight items, including questions adapted from the Family Adaptability and Cohesion Scales, second edition (FACES-II) (Olson, Portner, & Bell, 1982). Items assessed whether or not: support was provided during difficult times, it was easy for everyone in the family to express opinions, discipline was fair, it was easier to discuss problems with people outside of the family, people in the family knew each others’ close friends, everyone in the family shared responsibilities, and family members participated in activities together or went

<sup>1</sup>The Kuder-Richardson ( $KR_{20}$ ) internal consistency reliability coefficient is appropriate for use with dichotomous items and is equivalent to Cronbach’s alpha.

<sup>2</sup>Given the high levels of criminal activity, seeking information over a longer period of time likely would result in recall bias. This measure of criminal involvement reflects the respondent’s perspective and not based on criminal convictions. The main reasons for this are (1) self-reported criminal activity may more accurately reflect levels of crime than reported crime rates based on convictions. For example, rape or other forms of sexual abuse may be underreported due to fear further victimization by the perpetrator, and (2) it is not uncommon for crimes to be underreported, especially during times of political elections, which was the case for the city as well as the county.

<sup>3</sup>A large percentage (70%) of participants reported living in female-headed households while growing up (defined as before the age of 18) and almost one-half (47%) reported having no contact with their biological father during this time.

their own way. Responses to items ranged from “never” to “always” on a 5-point scale, with higher scores representing higher levels of perceived family cohesion ( $\alpha = .80$ ).

**Proximal processes during childhood and adolescence—*Juvenile delinquency*** was assessed using six dichotomous (yes/no) items adapted, in part, from questions used in the Monitoring the Future Project (Bachman & Johnston, 1978) including using someone’s credit card or forging a check, shoplifting, taking money or other things from someone’s purse or wallet, breaking into a house, school, or car, telling lies or playing tricks on people to obtain something and lying or fooling people to avoid fulfilling responsibilities. Possible scores on this measure ranged between 0 and 6, with higher scores representing higher levels of delinquency ( $KR_{20} = .70$ ). *Aggression* was derived from a scale constructed to measure individuals’ self conceptions related to violence (Giordano, Millhollin, Cernkovich, Pugh, & Rudolph, 1999). It included seven items that tapped individuals’ view of themselves in adolescence and adulthood, including getting into a lot of physical fights growing up, feeling the need to retaliate against those who inflicted verbal or physical assaults, getting pleasure from using one’s words to insult people, sometimes making fun of people to their faces, having trouble controlling one’s temper, becoming mean when drunk, and characterizing oneself as “a bully” when younger. Responses to items ranged from “strongly disagree” to “strongly agree” on a 5-point scale with higher scores reflecting a stronger perception of oneself as violent ( $\alpha = .71$ ).

**Current contextual and situational factors—*Illicit drug use*** included five dichotomous items asking whether respondents had used powder cocaine, crack, heroin, marijuana, or other illicit drugs in the past 90 days. Possible scores ranged from one to five, with higher scores indicating higher levels of substance use. *Living with someone involved in illegal activity in the past year* and *recent criminal justice involvement* (arrested, charged, and booked on a charge in the past year) were dichotomous variables. *Association with deviant peers* was measured using 17 questions adapted from the Crime and Violence Scale (Conrad et al., 2010) that assessed peer involvement in deviant activities in the past year, including violent and non-violent offending, drug activity and prostitution. Responses to items ranged from “none of them” to “all of them” on a 5-point scale and were summed such that higher scores indicated higher levels of deviant activity among peers ( $\alpha = .92$ ). *Perceived threat of victimization* was an 18-item measure based on the Fear of Victimization Scale (Warr & Stafford, 1983) that included fear of: home invasion, being raped, being hit by a drunk driver, having strangers hang out near one’s home late at night, being approached by a homeless person and being robbed or mugged on the street, among others. Items were scored as “not at all afraid,” “not very afraid,” “somewhat afraid,” “afraid,” or “very afraid.” Possible mean scores ranged from 0 to 3.78, with higher scores reflecting higher levels of perceived threat ( $\alpha = .95$ ). The mean score was used due to missing data on specific questions, such as fear of one’s car being stolen, which was not applicable for people who did not own cars. We used seven dichotomous (yes/no) items to assess *violent victimization* (Stewart et al., 2004) in the past year, including having money or possessions taken from one’s home or person, being threatened with a gun, being attacked with a gun, knife, stick, bottle or other weapon, being threatened with being beaten, having one’s property destroyed, and being beaten badly enough to sustain bruises. Higher scores reflected a higher occurrence of victimization ( $KR_{20} = .80$ ).

## Statistical Analyses

PASW Statistics 18.0 was used to estimate negative binomial regression given the count nature of the data. Family structure was eliminated from analyses because nearly 95% of the sample had lived with at least one biological parent growing up. There was minimal missing in the final models (6.6%) and case wise deletion was applied. A square root transformation

was applied to association with deviant peers due to a lack of normality. Separate repeated regressions were used to assess possible mediated effects of family-of-origin characteristics by the proximal processes of juvenile delinquency and aggression. Evidence of mediation was determined if family-of-origin variables had a significant effect on the mediating variables, family-of-origin variables each had a significant effect on the outcome variables when entered individually into a regression model that did not include the hypothesized mediators, and if the effects of family-of-origin variables were reduced to non-significance when the mediating variables were entered into the model using criteria outlined by Baron and Kenny (1986). Statistical significance of mediation was not reported due to necessity of using a non-linear model to predict the outcomes (MacKinnon & Dwyer, 1993). This study included family members and observations were therefore non-independent. To account for this, we used generalized estimating equations, applying the negative binomial distribution with a log link and the Huber-White Sandwich estimator (Rogers, 1993; Williams, 2000). This method accounted for the correlation of error terms between individuals within the same family to obtain robust standard errors. Prior to conducting multivariate analyses, Pearson correlations were computed and the findings showed that none of the independent variables were highly correlated. Only two demonstrated Pearson  $r$ 's of greater than .40, the highest of which was between maternal drug use and parental neglect ( $r = .45$ ). Full models consisted of variables that were significant at  $p < .10$  in bivariate analyses and final models consisted of variables that were significant at  $p < .10$  in full models.

## RESULTS

### Descriptive Statistics and Correlations

Table 1 presents the descriptive statistics and correlations. The sample was nearly evenly split between men and women. The mean age of the respondents was 21.60 years ( $SD=2.18$ ). Eighty-five percent of participants were non-white. The mean years of education were 11.05 ( $SD=1.62$ ). The majority of the sample was not employed and less than one-fifth were cohabitating. Nearly one-half had at least one child.

Men were more likely to have committed non-violent crimes, but there was no statistically significant association between gender and adult violent criminal involvement. There was an inverse association between age and having committed both types of crime. Greater education was negatively associated with involvement in violent crimes but not with non-violent crimes. Similarly, having at least one child was negatively related with non-violent criminal involvement but not with involvement in violent crimes.

Among the family-of-origin characteristics, having more than one sibling was correlated with a decrease in non-violent criminal involvement. On the other hand, maternal drug use was associated with an increase in involvement with violent crimes. Experiencing child sexual abuse was also associated with an increase in adult non-violent criminal involvement, whereas it only demonstrated a trend toward an association with adult violent criminal involvement. Child physical abuse and parental neglect were both related to an increase in adult non-violent and violent criminal involvement. However, family cohesion was only associated with a decrease in adult non-violent criminal involvement. The proximal processes of juvenile delinquency and aggression were associated with an increased involvement for both types of crimes. Living with someone involved in illegal activity and involvement with the criminal justice system in the past year both were correlated with an increase in committing non-violent crimes. Criminal justice engagement in the past year demonstrated a trend toward a significant association with adult violent crime involvement. Association with deviant peers in the past year was associated with increased involvement in both types of crimes, while perceived threat of victimization was only associated with a



decrease in non-violent criminal involvement. Violent victimization in the past year was associated with increased adult non-violent and violent criminal involvement.

### Multivariate Results

Poisson regression requires that the mean and the variance of the outcome variable be equal. Given that the variances for non-violent crime and violent crime were slightly larger than their respective means, negative binomial regression was used to account for this indication of over dispersion (Hilbe, 2008). In these analyses, the negative binomial regressions model the log of the expected counts of non-violent and violent crime. An exponentiation of the coefficients yields an estimate of the percentage change in the outcome for a one-unit change in each independent variable (Long, 1997).

In the full model predicting non-violent crime, gender demonstrated a trend toward a positive association (see Table 2). Age, having more than one sibling and parental neglect demonstrated trends toward negative associations with non-violent crime while juvenile delinquency, aggression and living with someone involved in illegal activity during the past year were positively associated with non-violent crime. Criminal justice involvement in the past year demonstrated a trend toward a positive association with non-violent crime and having been victimized in the past year was positively associated with non-violent crime. In the final model predicting non-violent crime, males were expected to have a rate of non-violent crime that was 37% greater than females. Having more than one sibling also was also associated with a 34% decrease in rate of non-violent crime compared to having fewer siblings. An increase in juvenile delinquency was associated with a rate increase in non-violent crime of 18% and an increase in aggression was associated with a rate increase of 4%. Living with someone involved in illegal activities was associated with a 57% increase in non-violent crimes and an increase in violent victimization was also associated with a 13% increase in non-violent crimes.

In the full model predicting violent crime, age demonstrated a trend toward a negative association with the outcome. Aggression, association with deviant peers and violent victimization in the past year either demonstrated a trend toward association with violent crimes or were positively associated with violent crimes. In the final model predicting violent crime, an increase in aggression was associated with an 8% rate increase in violent crimes, an increase in association with deviant peers was associated with a 13% increase in violent crimes and an increase in violent victimization was associated with an 18% increase in violent crimes.

### Mediation Analyses

Four family-of-origin characteristics demonstrated the potential for being antecedents of non-violent crime mediated by juvenile delinquency based on their association with the mediator and the outcome, controlling for gender: childhood sexual abuse ( $r=.18$ ,  $b=.45$ ), childhood physical abuse ( $r=.17$ ,  $b=.06$ ), parental neglect ( $r=.30$ ,  $b=.05$ ), and perceived family cohesion ( $r=-.34$ ,  $b=-.04$ ). In separate regression analyses controlling for gender, each of the coefficients were no longer statistically significant with juvenile delinquency in the model. Aggression was tested as a mediator of family size ( $r=-.16$ ,  $b=-.45$ ), childhood physical abuse ( $r=.15$ ,  $b=.06$ ), parental neglect ( $r=.30$ ,  $b=.05$ ), and perceived family cohesion ( $r=-.13$ ,  $b=-.04$ ). Only family size and parental neglect were no longer significant in models including aggression (Table 3).

Two family-of-origin characteristics were potentially mediated in their effect on violent crime by juvenile delinquency based on their association with the mediator and the outcome, controlling for education: childhood physical abuse ( $r=.17$ ,  $b=.09$ ) and parental neglect ( $r=-$

30,  $b=.09$ ). Both of these were still significant when juvenile delinquency was included in regression models.

Childhood physical abuse ( $r=.15$ ,  $b=.09$ ) and parental neglect ( $r=.30$ ,  $b=.09$ ) were antecedents of violent crime that were potentially mediated by aggression. Of these, only childhood physical abuse was no longer statistically significant when aggression was included in the model (Table 4).

## DISCUSSION

In this paper, we examine the relative contribution of four domains of predictors hypothesized to influence adult criminal involvement: (1) socio-demographic characteristics; (2) family-of-origin characteristics; (3) the proximal processes of juvenile delinquency and aggression; and (4) current contextual and situational characteristics. Additionally, the proximal processes of juvenile delinquency and aggression are explored as mediators of the association between family-of-origin characteristics and adult criminal involvement.

The respondents in this study reside in neighborhoods in which social chaos, including low levels of social control, is part of everyday life (Sterk, 1999; Stewart et al., 2004). However, it is important to understand if the impact of this environment varies according to multiple levels of influence. Criminal involvement was prevalent, with more than three quarters of the sample reporting some involvement in crime over the past year. Building on earlier studies, a key aim of the current analysis was to identify potential predictors of adult criminal involvement among an at-risk population, paying particular attention to the relative influence of past childhood experiences, as well as the effect of current lifestyle and situational factors.

Among socio-demographic characteristics, only gender was independently associated with an increase in adult non-violent criminal involvement. Having more than one sibling was the only family-of-origin variable associated with non-violent criminal involvement in multivariate regression models. No family-of-origin variables remained significant in the final model predicting violent criminal involvement.

The analyses of the potential mediation of these characteristics by proximal processes provide interesting elaborations to the theoretical models described earlier. For non-violent adult criminal involvement, juvenile delinquency and aggression were significant predictors in multivariate analysis, with a slightly larger effect for juvenile delinquency. This is understandable given that many of the acts described as juvenile delinquency are similar to those encompassed under adult non-violent crime. In separate analyses, juvenile delinquency was shown to mediate the impact of childhood sexual and physical abuse, parental neglect, and perceived family cohesion. There is some evidence that supportive family relationships may buffer children from the adverse effects of poverty and other negative influences in their environment (Gorman-Smith, Henry, & Tolan, 2004; McCord, 1991). Findings from the current study, which focused on individuals living in disadvantaged inner-city neighborhoods, indicate that individuals who lack support from their families may be particularly at risk for criminal involvement. If those familial characteristics lead to acts of juvenile delinquency, it is perhaps the more recent proximal process (Bronfenbrenner, 1999) that lays the groundwork for what ultimately translates to adult non-violent crime.

The current situational factor of living with someone who is involved with illegal activities was also a significant predictor of non-violent crime, providing support for Warner's (2003) discussion of attenuated culture and weakened social control as well as Osgood et al.'s

(1996) extension of the routine activities/lifestyle perspective (Cohen & Felson, 1979; Hindelang, Gottfredson & Garofalo, 1978) which proposes that a broad range of deviant activities, including criminal involvement, may be symbiotically linked based on circumstances of everyday life, including time spent with peers.

In separate analyses, aggression was shown to mediate the impact of family size and parental neglect on involvement in non-violent crime when only considering socio-demographics as potential confounders. It may be that there is potential for family members to limit criminal involvement that is negated for young adults who develop aggressive tendencies with other children. This would again emphasize the importance of repeated interactions on future behaviors (Bronfenbrenner, 1999). Similarly, parental involvement or non-involvement may become less salient as predictors of non-violent crime when considering whether a child has gone on to develop aggressive habits when interacting with other children. While family experiences have been linked to adult criminal involvement (Hoffman, 2003; Kierkus & Baer, 2002; Sorenson & Brownfield, 1995), it has also been shown that parental influences are no longer significant in predicting crime when aggression is considered (Huesmann et al., 2002).

In contrast to non-violent criminal involvement, only the proximal process of aggression was a significant predictor of an increased number of violent criminal acts while juvenile delinquency was no longer significant in multivariate analysis. This might be expected as the components of the aggression scale are far more similar to those described in the violent crime scale in contrast to the composition of the juvenile delinquency measure. Theoretically, aggression as a proximal process or repeated interaction (Bronfenbrenner, 1999) seems to provide a more coherent predictor for later violent behavior. In separate analyses, aggression was found to mediate the effect of childhood physical abuse on violent criminal involvement, perhaps indicating that some children may not develop aggressive tendencies and may not go on to commit violent crimes despite having experienced such maltreatment. Parental neglect, however, remained significantly associated with violent criminal involvement after inclusion of aggression in the model, suggesting that that type of negative family-of-origin experience is associated with violent criminal involvement regardless if the young adult displays aggressive tendencies.

Associating with deviant peers was a significant predictor of violent crime. This expected result corroborates a large body of previous research (see for example, Jensen & Brownfield, 1986; Osgood et al., 1996; Sterk, 1999; Stewart et al., 2004; Theall, Sterk, & Elifson, 2009). Also key is the development of an identity (i.e., norms, values, and beliefs), which condones violence. In addition to negative family influences and childhood maltreatment, certain environmental factors, such as neighborhood violence and disorder that would include deviant peers, may promote such an identity.

Consistent with previous research (Gottfredson & Hirschi, 1990; Jensen & Brownfield, 1986; Kingston, Huizinga, & Elliott, 2009; Schreck, Wright, & Miller, 2002), results from the current study showed a strong association between violent victimization and both non-violent and violent criminal involvement, indicating that offenders are at high risk of becoming victims of crime. Given our finding that aggression is predictive of violent adult criminality, these findings may reflect a coping strategy identified among youths growing up in disadvantaged communities marked by violence referred to as the “code of the street” (Anderson, 2000; Stewart et al., 2002; Stewart & Simons, 2006). The code of the street is described as a way of managing day-to-day threats and defending one’s life and possessions by developing an aggressive self-concept that legitimates violence and deviant behavior (Stewart et al., 2002). According to this code, individuals must show no fear and react aggressively to threats or risk loss of reputation (Anderson, 2000). Others have expanded on

this work, most notably by emphasizing the importance of culture (Warner, 2003). Shaw and McKay (1969) introduced the notion of divergent values systems, especially in communities with a concentration of crime. Children growing up in such communities are exposed to crime, criminally active individuals and values that provide incentives such as status and success for such behaviors. Kornhauser (1978) and later Anderson (2000) build on the notion of cultural disorganization in addition to structural disorganization. Warner (2003) also highlights the role of a weakened normative culture on informal social control.

If Anderson's (2000) street code thesis is correct, individuals living under these conditions may have few other options for survival, indicating a need to consider the larger economic, social, and political contexts that shape communities. Our findings also showed that juvenile delinquency and aggression each mediated the effect of multiple family-of-origin characteristics on adult criminal involvement, indicating that these factors are associated with juvenile delinquency and the development of aggressive behavior, which, in turn, may increase the likelihood of adulthood criminal involvement. Aggression was also found to mediate the effect of child physical abuse on violent criminal involvement. These findings support the "cycle of violence" theory, which proposes that a history of childhood physical abuse predisposes victims to develop violent tendencies and engage in criminal behavior. Although this study is cross-sectional, preventing us from establishing causality, these findings showed an association between more recent violent victimization and both non-violent and violent criminal behavior. These results lend some support to previous research showing that offending and victimization may have reciprocal effects, resulting in repeat offending and repeat victimization (Fagan & Mazerolle, 2008; Zhang, Welte, & Wieczorek, 2001).

This study is subject to a number of limitations. As stated above, the cross-sectional design precludes causality. The sample is also purposive and generalizations must be made with caution; the participants were low-income, primarily non-white, living in the inner-city and a large proportion had participated in criminal activity. However, the antecedent variables in our mediation analyses were retrospective and enabled us to establish theoretical temporality. To better establish validity, longitudinal or perhaps retrospective case control designs comparing criminals and non-criminals that match participants on other past and current factors would be helpful.

At an individual and a neighborhood level, these findings have important implications for programs aimed at reducing risk of criminal involvement and associated victimization. One strategy for counteracting negative family influences affecting youth living in disadvantaged communities may be the promotion of alternate role models through youth mentoring programs, such as Big Brothers and Big Sisters. Interventions aimed at adults will require addressing the long-term impact of abuse and violence and providing non-violent and legal options for achieving status and survival in the community. Intervention studies examining the impact of providing such opportunities in disadvantaged communities have shown that criminal involvement, as well as other related health risks, tends to decrease (see, for example, Sterk et al., 2007). Finally, the findings show the need for more research aimed at disentangling the influence of individual and situational factors, as well as family and community factors that may promote criminal behavior and associated victimization.

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TABLE 1

## Descriptive Statistics and Correlations

	Mean	SD	Adult Non-Violent Crime	Adult Violent Crime
<i>Socio-demographic Characteristics</i>				
Gender (male)	.53		.25***	.04
Age	21.60	2.18	-.19**	-.18**
Racial background (non-white)	.85		-.10	.04
Education (years)	11.05	1.62	-.08	-.14*
Employment status (employed)	.29		.10	-.06
Relationship status (cohabitating)	.19		.07	.05
Children (at least one)	.47		-.15*	-.00
<i>Family-of-Origin Characteristics</i>				
Family size (>1 siblings)	.87		-.20**	.04
Maternal drug use	.50		.01	.15*
Childhood sexual abuse	.21		.21**	.12 <sup>†</sup>
Childhood physical abuse	1.92	2.76	.21**	.23***
Parental neglect	3.55	3.54	.22**	.32***
Perceived family cohesion	18.03	5.88	-.26***	-.08
<i>Proximal Processes during Childhood and Adolescence</i>				
Juvenile delinquency	2.83	1.72	.44***	.32***
Aggression	19.56	4.69	.42***	.43***
<i>Current Contextual and Situational Factors</i>				
Illicit drug use, past 90 days	2.54	.68	.08	.03
Living with someone involved in illegal activity, past year	.53		.28***	.10
Criminal justice involvement, past year	.38		.26***	.11 <sup>†</sup>
Association with deviant peers, past year <sup>d</sup>	3.78	1.65	.29***	.35***
Perceived threat of victimization (mean)	1.49	1.02	-.13*	-.07
Violent victimization, past year	1.93	2.10	.52***	.51***
Adult Non-Violent Crime	2.09	1.84		
Adult Violent Crime	1.20	1.39		

<sup>a</sup>Square root transformed

<sup>†</sup>p < .10;

\* p < .05;

\*\* p < .01;

\*\*\* p < .001

TABLE 2

Full and Reduced Negative Binomial Regression Models for Non-Violent and Violent Crime

	Adult Non-Violent Crime Full	Adult Non-Violent Crime Reduced	Adult Violent Crime Full	Adult Violent Crime Reduced
<i>Socio-demographic Characteristics</i>				
Gender (male)	.27 <sup>†</sup>	.32*		
Age	-.06 <sup>†</sup>	-.06 <sup>†</sup>	-.09 <sup>†</sup>	-.07
Education (years)			-.01	
Children (at least one)	-.18			
<i>Family-of-Origin Characteristics</i>				
Family size (>1 siblings)	-.33 <sup>†</sup>	-.42*		
Maternal drug use			.41	
Childhood sexual abuse	.13		-.29	
Childhood physical abuse	.01		.04	
Parental neglect	-.04 <sup>†</sup>	-.03	.00	
Perceived family cohesion	-.01			
<i>Proximal Processes during Childhood and Adolescence</i>				
Juvenile delinquency	.16**	.17***	.08	
Aggression	.04*	.04*	.07**	.08***
<i>Current Contextual and Situational Factors</i>				
Illicit drug use, ever/past 90 days				
Living with someone involved in illegal activity, past year	.37*	.45**		
Criminal justice involvement, past year	.24 <sup>†</sup>	.17	.10	
Association with deviant peers, past year <sup>a</sup>	.01		.13 <sup>†</sup>	.12*
Perceived threat of victimization	-.10			
Violent victimization, past year	.11**	.12**	.15**	.17***

<sup>a</sup>Square root transformed<sup>†</sup>p < .10;

\* p &lt; .05;

\*\* p &lt; .01;

\*\*\* p &lt; .001

TABLE 3

Mediation Testing for Adult Non-Violent Crime: Family-of-Origin through Proximal Processes during Childhood and Adolescence

	Mediator Pearson Correlations (r)	Adult Non-Violent Crime <sup>a,b</sup> (b)	Adult Non-Violent Crime with Mediator <sup>a,b</sup> (b)
<i>Juvenile Delinquency</i> <sup>b</sup>		.23 <sup>***</sup>	
Family size (>1 siblings)	-.07		
Maternal drug use	.10		
Childhood sexual abuse	.18 <sup>**</sup>	.45 <sup>**</sup>	.30
Childhood physical abuse	.17 <sup>**</sup>	.06 <sup>**</sup>	.05 <sup>†</sup>
Parental neglect	.30 <sup>***</sup>	.05 <sup>**</sup>	.01
Perceived family cohesion	-.34 <sup>***</sup>	-.04 <sup>***</sup>	-.02 <sup>†</sup>
<i>Aggression</i>		.08 <sup>***</sup>	
Family size (> 1 siblings)	-.16 <sup>*</sup>	-.45 <sup>*</sup>	-.25
Maternal drug use	.12 <sup>†</sup>		
Childhood sexual abuse	.06		
Childhood physical abuse	.15 <sup>*</sup>	.06 <sup>**</sup>	.04 <sup>*</sup>
Parental neglect	.30 <sup>***</sup>	.05 <sup>**</sup>	.03
Perceived family cohesion	-.13 <sup>*</sup>	-.04 <sup>**</sup>	-.03 <sup>**</sup>

<sup>a</sup> Negative binomial regression

<sup>b</sup> All regressions with juvenile delinquency are controlling for gender

<sup>†</sup> p < .10;

\* p < .05;

\*\* p < .01;

\*\*\* p < .001

TABLE 4

Mediation Testing for Adult Violent Crime: Family-of-Origin through Proximal Processes during Childhood and Adolescence

	Mediator Pearson Correlations (r)	Adult Violent Crime <sup>a,b</sup> (b)	Adult Violent Crime with Mediator <sup>a,b</sup> (b)
<i>Juvenile Delinquency</i> <sup>b</sup>		.21 **	
Family size (>1 siblings)	-.07		
Maternal drug use	.10		
Childhood sexual abuse	.18 **	.26	
Childhood physical abuse	.17 **	.09 **	.06 *
Parental neglect	.30 ***	.09 ***	.06 **
Perceived family cohesion	-.34 ***	-.02	
<i>Aggression</i>		.11 ***	
Family size (>1 siblings)	-.16 *	.14	
Maternal drug use	.12 †		
Childhood sexual abuse	.06		
Childhood physical abuse	.15 *	.09 **	.06 †
Parental neglect	.30 ***	.09 ***	.07 **
Perceived family cohesion	-.13 *	-.02	

<sup>a</sup> Negative binomial regression

<sup>b</sup> All regressions with juvenile delinquency are controlling for education

† p < .10;

\* p < .05;

\*\* p < .01;

\*\*\* p < .001