



# Aging out of adolescent delinquency: Results from a longitudinal sample of youth and young adults

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## ARTICLE INFO

### Keywords:

Add health  
Age-crime  
Aging out  
Delinquency  
Socialization

## ABSTRACT

One of the most consistent findings to emerge from criminological research is the age-crime curve. To date, however, there has not been much consensus regarding the mechanism(s) that are responsible for creating the distribution of crime across age. The current study uses this backdrop as a springboard to examine the potential factors that might account for why some adolescents who are heavily involved in nonviolent and violent delinquency “age out” of crime and delinquency during the transition to adulthood whereas others persist with such behavior. To do so, data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) are analyzed. The results reveal relatively inconsistent effects of multiple socialization and individual differences measures on the aging out process across multiple time periods. Two measures—delinquent peers and low self-control—however, do have some statistically significant effects on some of the aging out measures. The potential reasons for the results are discussed and directions for future research are offered.

## 1. Introduction

One of the most well-known findings to emerge from criminological research is the age-crime curve, wherein criminal involvement is largely nonexistent until around the age of 12, rises precipitously until around the age of 19, and then declines thereafter (Farrington, 1986). By the mid-twenties, criminal involvement is typically confined to a very small group of chronic offenders (Moffitt, 1993). This age-crime distribution has been detected in virtually every society, across every historical time period, and in virtually every sample ever analyzed (Hirschi & Gottfredson, 1993). Despite the near universal nature of the age-crime curve, the causes of it remain a matter of debate (Blumstein, Cohen, & Farrington, 1988; Greenberg, 1985; Hirschi & Gottfredson, 1993). Even though a wide number of explanations have been advanced to try to explain at least part of the age-crime curve (Farrington, 1986; Moffitt, 1993; Sampson & Laub, 1993), much remains unknown about what accounts for this distribution of crime across age groups, particularly why youth “age out” of crime after adolescence. Explanations range from shifts in exposure to delinquent peers that occur across the life course (Warr, 1993, 2002) to changes in brain maturation and

biochemistry that occur in late adolescence (Collins, 2004; Wright, Tibbetts, & Daigle, 2008).

Despite such research, and despite some recent research providing important information about the factors that might account for the age-crime curve (Sweeten, Piquero, & Steinberg, 2013), findings across studies have yet to converge fully on the factors that definitively account for the age-crime distribution. This is a particularly noteworthy lapse in the knowledge base for at least two key reasons. First, without more specific details regarding the factors that give rise to the age-crime curve, criminological theories—particularly developmental theories of crime—are at a disadvantage at providing a fully specified and accurate account of criminal involvement across the life course. Second, and relatedly, delinquency prevention and treatment programs could gain some much-needed insight into how to prevent delinquency and/or help to rehabilitate adolescent offenders if the factors that account for the drop in delinquent involvement in the late teens and early twenties were understood. Against this backdrop, the current study is designed to shed some additional light on factors that might account for changes in delinquent involvement that occur during adolescence and into young adulthood. To do so, data drawn from a longitudinal sample

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of adolescence and early adulthood were analyzed.

### 1.1. Adolescence-limited offending framework

While the age-crime curve is largely considered a “brute fact” of crime, there remains a great deal of debate regarding what, if any, criminological factors are able to account for the nexus between age and crime (Greenberg, 1985; Hirschi & Gottfredson, 1983; Sweeten et al., 2013). One of the key contemporary theoretical contributions to provide a direct explanation of the age-crime connection comes from Moffitt's (1993) developmental taxonomy. In her theory, Moffitt identifies two groups of offenders: adolescence-limited (AL) offenders and life-course-persistent (LCP) offenders. To begin with, LCP offenders are chronic criminals who engage in offending behaviors across their entire life course. In childhood, they are troublesome and engage in age-inappropriate antisocial behaviors, in adolescence they engage in delinquency, and during adulthood they continue to be involved in criminal behaviors. According to this taxonomy, the cause of LCP offending is an interplay between neuropsychological deficits and an adverse environment, particularly the environment found within the family.

The causes of AL offending, however, are quite different from the causes of LCP offending. AL offending occurs because of the interplay between social mimicry and what is known as the maturity gap. The maturity gap, according to Moffitt, occurs in adolescence because of the disjuncture that exists between youths' physical development and the limits that are placed on them socially. For instance, adolescents are often physically mature in the sense that they resemble adults and may be able to procreate. At the same time, though, they are not afforded the same opportunities and privileges as adults. They are not allowed to purchase and consume alcohol legally, they are not granted the right to vote in elections, and they are forced to attend school. The end result is that there is dissonance between their physical maturity and their social maturity and this dissonance is referred to as the maturity gap. To alleviate this disjuncture, adolescents tend to mimic the “adult-like” behaviors of LCP offenders, such as drinking alcohol, engaging in risky sexual behaviors, and skipping school. After AL offenders are afforded all of the same responsibilities as adults, typically around the ages of 18–21, they no longer need to reduce the gap between their physical and social maturity. As a result, they cease offending during this time period which corresponds almost perfectly with the sudden decrease in criminal involvement in early adulthood that characterizes the age-crime curve.

A small body of research has examined directly whether Moffitt's maturity gap explanation for AL offenders has merit. Overall, the available research provides some support for the role of the maturity gap in AL offending. For instance, in the first direct test of the maturity gap explanation, Barnes and Beaver (2010) analyzed data drawn from a longitudinal and nationally representative sample of youth. Their analysis revealed that the maturity gap predicted involvement in minor forms of delinquent acts and for drug use, but not for more serious types of offending behaviors. Importantly, the predictive ability of the maturity gap was isolated largely to males as the findings were not as predictive for females. Although the measurement of the maturity gap varies across studies, overall the results from other studies have revealed similar findings in respect to the connections between the maturity gap and AL offending (Dijkstra et al., 2015; Piquero & Brezina, 2001).

The results bearing on the maturity gap and AL offending have provided some support in favor of Moffitt's developmental taxonomy. At the same time, however, the results generated from such studies have shown that the maturity gap is only weakly correlated with AL offending and thus only accounts for a small percentage of the variance in AL offending. Such a weak association strongly suggests that there are other as-of-yet uncovered factors that also play an integral role in the development of AL-only offending and in the shaping of the age-crime curve. What these other factors might be are not fully known at this point, as there has been little research that has examined a broad

array of factors that might account for AL offending. However, some direction into the factors that might be involved can be garnered by relying on some of the seminal research to derive from life-course criminology and its focus on discontinuity and change in antisocial behavioral patterns.

### 1.2. The life-course perspective and adolescent delinquency

More than 25 years ago, Sampson and Laub (1993) imported the life-course perspective into criminology by advancing an age-graded theory of informal social control. Since that time, the life-course perspective has guided and shaped a long line of research which has examined a wide array of research issues. One area that has received a considerable amount of attention focuses on behavioral stability and change over different sections of the life course. Sampson and Laub's (1993; Sampson, Laub, & Wimer, 2006) scholarship, in particular, has focused on desistance from criminal behavior—that is, being involved in crime at one point in time and yet abstaining from it later on in the life course. To do so, they highlighted the importance of salient social institutions, such as entering into a high-quality marriage or obtaining lawful, valued employment, in deflecting individuals off of an antisocial pathway and onto a prosocial pathway. A substantial amount of research has evaluated their claims regarding the factors that promote behavioral change and the findings from these studies have produced a great deal of support in favor of their propositions (Bersani & Doherty, 2018; Laub, Nagin, & Sampson, 1998; Laub & Sampson, 2011; Maume, Ousey, & Beaver, 2005).

While Sampson and Laub's work drew attention to factors that might be involved in why some criminals desist from future criminal involvement, the thrust of their work and the studies testing their theory have focused on adulthood criminal behavior (Laub & Sampson, 2011; Sampson & Laub, 1993; Sampson, Laub, & Wimer, 2006). Their theoretical framework and subsequent tests of it were comparatively less concerned with the change in delinquent involvement that occurs at the end of adolescence and the beginning of adulthood. Even so, it stands to reason that if adulthood social bonds, such as marriage and employment, are related to desistance from crime in adulthood, then socialization factors in adolescence might also be involved in the aging out process that typically occurs during the transition from adolescence to adulthood. In particular, socialization factors and social bonds that are found within the family—particularly in respect to mothers—have been shown to be quite important when it comes to resiliency to antisocial behaviors and reductions in criminal behaviors both within adolescence and later in the life course (Hirschi, 1969; Smith, Lizotte, Thornberry, & Krohn, 1995; Weinraub & Wolf, 1983; Werner, 1993; Werner & Smith, 1982).

Of course, other social institutions besides those found within the family are particularly salient to adolescents and their behavioral patterns; chief among these is the adolescent peer group. Research has shown consistently that exposure to delinquent peers is one of the strongest predictors of adolescent delinquent involvement (Warr, 2002). Moreover, and particularly germane to the current study, is that research has shown that changes in exposure to delinquent peers might account for at least part of the age-crime curve distribution (Warr, 1993) and that desistance from criminal behavior later in the life course is structured largely by reductions in contact with antisocial peer groups (Warr, 1998).

At the same time, however, there has also been a line of inquiry underscoring the possibility that social-environmental issues might not be the only factors salient to behavioral changes in adolescence and adulthood. Propensity-based approaches focus on how personality traits and other individual differences might predispose to behavioral stability and even to behavioral change (Nagin & Farrington, 1992; Nagin & Paternoster, 2000; Wilson & Herrnstein, 1985). Perhaps the most well-known of these propensity-based approaches is Gottfredson and Hirschi's (1990) theory of low self-control, wherein they posit that

individual variation in levels of self-control are the key cause of delinquent and criminal involvement. Their theory is designed to explain stability in antisocial behaviors over the life course, however, there are some research revealing that offenders who have higher levels of self-control are much more apt to cease offending when compared with offenders who have lower levels of self-control (Ragan & Beaver, 2010).

In addition to self-control perhaps the other individual difference that has been scrutinized closely when it comes to crime is intelligence. Findings from studies have shown that lower scores on intelligence tests and reductions in cognitive skills are risk factors for involvement in crime, delinquency, and antisocial behaviors (Beaver et al., 2013; Schwartz et al., 2015). Whether variation in intelligence scores would foster or impede the aging out process in the transition from adolescence to adulthood remains an open-empirical question. However, given that intelligence has been shown to predict a wide array of both antisocial and prosocial outcomes (Herrnstein & Murray, 1994), it stands to reason that intelligence might be an important factor to consider when examining the age-crime distribution.

### 1.3. Current study

The current study is designed to examine the potential factors that might be involved in why adolescents who were heavily engaged in delinquency during adolescence age out of such behavior at subsequent points in the life course. Unlike previous research, the current study does not conceptualize adolescent offenders as belonging to a particular group from Moffitt's developmental taxonomy, but rather focuses on changes in delinquent behavior in the transition from adolescence to early adulthood. To do so, we rely on existing research to identify factors that are likely most salient in this regard. Specifically, we analyze the role of family dynamics, peer exposure, and social support on aging out of adolescent offending as well as the role of individual differences, including levels of self-control and intelligence.

## 2. Methods

### 2.1. Data

Data for this study were drawn from the National Longitudinal Study of Adolescent to Adult Health (Add Health; Udry, 2003). The Add Health is a longitudinal and nationally representative sample of youth who were attending middle or high school during the 1994–1995 school year. To date, four waves of data have been collected (with a fifth wave being currently collected). The first wave of data—known as the wave 1 in-school survey—included more than 90,000 youth who were nested within 132 different middle or high schools. This component of the survey was administered during a school day and information was collected via self-report. A wide range of questions were asked, including those relating to peers, behaviors, and family dynamics. Of the respondents who participated in the wave 1 in-school component of the study, 20,745 (and 17,700 of their primary caregivers) were asked to be reinterviewed in their homes (Harris et al., 2003). This component of the survey—known as the wave 1 in-home survey—included more detailed questions and more questions pertaining to sensitive information. For instance, respondents were asked questions about their delinquent involvement, their drug use, their sexual behaviors, and their family life.

About 1.5 years after the Add Health study began, a second round of data was collected (Harris et al., 2003). This component of the study—referred to as the wave 2 component of the study—included 14,197 youth who were administered survey instruments that were very similar to those that were administered during the wave 1 in-home component to the study. Once again, adolescents were asked questions about their involvement in risky and delinquent behaviors as well as questions regarding their social lives. The third wave of data was then collected in the 2001–2002 when approximately 15,000 respondents

were successfully reinterviewed. Given that most of the respondents were no longer adolescents, the survey instruments were changed to be more age-appropriate. Participants, for example, were asked questions about their educational history, their marital status, and their involvement in criminal behaviors. Finally, in 2007–2008 the fourth wave of data was collected. In total, 15,701 respondents—who were between the ages of 24 and 32 years of age—participated in the wave 4 component of the study. They were asked a wide range of questions pertaining to multiple spheres of their lives, including contact with the criminal justice system, sexual behaviors, and physical health. Collectively, these data span approximately 13 years of human development from adolescence to early adulthood.

### 2.2. Measures

#### 2.2.1. Delinquency measures

**2.2.1.1. Nonviolent delinquency.** A nonviolent delinquency scale was created by using data collected from wave 1 interviews. Nine items were identified that tapped variation in nonviolent delinquency during adolescence. For instance, youth were asked to indicate the frequency in the previous 12 months with which they engaged in damaging property, selling drugs, stealing something worth less than \$50, and stealing something worth more than \$50. Item responses were coded as follows: 0 = never, 1 = one or two times, 2 = three or four times, and 3 = five or more times. Responses to these items were then summed together to create a nonviolent delinquency scale ( $\alpha = 0.79$ ).

**2.2.1.2. Violent delinquency.** A violent delinquency scale was developed based on responses to six questions regarding the respondent's participation in acts of violent delinquency at wave 1. Specifically, youth were asked to indicate the frequency (during the previous 12 months) with which they were part of a physical fight, used a weapon in a fight, and participated in a group fight. Responses to these items were coded using the following response set: 0 = never, 1 = one or two times, 2 = three or four times, and 3 = five or more times. In addition, youth were asked the following two questions: how whether they had shot or stabbed someone and whether they had pulled a knife or gun on someone. These two items were originally coded dichotomously (0 = no, 1 = yes). However, to provide more weight to these items, and following the lead of previous research (Guo, Roettger, & Shih, 2007), these responses were recoded, such that 0 = no, and 3 = yes. These item responses were then summed together to create the violent delinquency scale ( $\alpha = 0.76$ ).

**2.2.1.3. Total delinquency.** A total delinquency scale was created by combining the items from the nonviolent delinquency and violent delinquency scales garnered during wave 1 interviews. Doing so helps to provide a more comprehensive account of involvement in delinquency regardless of the type of delinquent act. A total of 15 items were included in this scale ( $\alpha = 0.84$ ).

#### 2.2.2. Aging out measures

**2.2.2.1. Aging out of nonviolent delinquency.** Aging out of nonviolent delinquency was measured separately at waves 2, 3, and 4. To develop these aging out measures, a two-step process was followed. First, a wave-specific nonviolent delinquency scale was created. These scales were summated scales that consisted of a broad range of nonviolent acts of delinquency. Specifically, at wave 2 nine items were summed ( $\alpha = 0.78$ ), at wave 3 eight items were summed ( $\alpha = 0.68$ ), and at wave 4 eight items were summed ( $\alpha = 0.62$ ). Higher values on these scales represent greater levels of involvement in nonviolent delinquency. The second step in the process was to dichotomize these items to indicate whether aging out occurred. To do so, a strict interpretation of aging out was employed, such that aging out was only viewed as being present (at each wave) if the respondent indicated complete abstention from nonviolent delinquency. As a result, each of

the summated nonviolent delinquency scales was transformed into a dichotomous measure of aging out by using the following coding scheme: 0 = involvement in at least one act of nonviolent delinquency and 1 = no reported involvement in nonviolent delinquency. Therefore, 0 = not aging out of nonviolent delinquency and 1 = aging out of nonviolent delinquency for each specific wave of data.

**2.2.2.2. Aging out of violent delinquency.** A process identical to measuring aging out of nonviolent delinquency was used to measure aging out of violent delinquency. The difference, of course, was that instead of nonviolent behaviors being assessed, violent behaviors were assessed instead. Specifically, wave-specific violent delinquency scale were created that consisted of a broad range of violent acts of delinquency. Specifically, at wave 2 six items were summed ( $\alpha = 0.78$ ), at wave 3 five items were summed ( $\alpha = 0.60$ ), and at wave 4 five items were summed ( $\alpha = 0.60$ ). Higher values on these scales represent greater levels of involvement in violent delinquency. Next these scales were dichotomized to indicate aging out or the continued involvement of violent delinquency. To do so, aging out was only viewed as being present (at each wave) if the respondent indicated complete abstention from violent delinquency. As a result, each of the summated violent delinquency scales was transformed into a dichotomous measure of aging out by using the following coding scheme: 0 = involvement in at least one act of violent delinquency and 1 = no reported involvement in violent delinquency. Therefore, 0 = not aging out of violent delinquency and 1 = aging out of violent delinquency for each specific wave of data.

**2.2.2.3. Aging out of total delinquency.** Finally, measures of aging out of total delinquency were developed. These measures combined together the nonviolent and violent delinquency items specific to each wave (i.e., the wave 2 nonviolent delinquency scale and the wave 2 violent delinquency scale, the wave 3 nonviolent delinquency scale and the wave 3 violent delinquency scale, and the wave 4 nonviolent delinquency scale and the wave 4 violent delinquency scale). This process resulted in a wave 2 total delinquency scale ( $\alpha = 0.84$ ), a wave 3 total delinquency scale ( $\alpha = 0.73$ ), and a wave 4 total delinquency scale ( $\alpha = 0.57$ ). Next these scales were dichotomized to indicate whether the aging out process had occurred. To do so, aging out was only viewed as being present (at each wave) if the respondent indicated complete abstention from total delinquency. As a result, each of the summated violent delinquency scales was transformed into a dichotomous measure of aging out by using the following coding scheme: 0 = involvement in at least one act of delinquency and 1 = no reported involvement in delinquency. Therefore, 0 = not aging out of total delinquency and 1 = aging out of total delinquency for each specific wave of data.

## 2.2.3. Socialization measures

**2.2.3.1. Delinquent peers.** One of the strongest and most consistent findings to emerge from criminological research is the relationship between exposure to delinquent peers and delinquent involvement (Warr, 2002). As a result, a three-item delinquent peers scale was included in the analyses. Importantly, this scale is identical to the one that has been used previously (Bellair, Roscigno, & McNulty, 2003). Specifically, during wave 1 interviews, respondents were asked how many of their three closest friends smoke at least one cigarette per day, smoke marijuana more than once per month, and consume alcohol at least once per month. Responses to these items were coded such that 0 = zero friends, 1 = one friend, 2 = two friends, and 3 = three friends. Responses to these items were then summed together to create the delinquent peers scale ( $\alpha = 0.76$ ).

**2.2.3.2. Maternal disengagement.** Parents who are disengaged from their children tend to be at-risk for raising offspring who are delinquent or criminal (Loeber & Stouthamer-Loeber, 1986). To take

this finding into account, a maternal disengagement scale was included in the analyses. Specifically, during wave 1 interviews participants were asked five questions pertaining to maternal disengagement, including the overall quality of their relationship with their mother and how much warmth she provided them. Identical to previous research (Beaver, 2008), responses to these items were summed together to create the maternal disengagement scale ( $\alpha = 0.84$ ), wherein higher values indicated greater levels of maternal disengagement.

**2.2.3.3. Maternal attachment.** A significant amount of research has shown that maternal attachment is critical to prosocial behavior among adolescents (Gottfredson & Hirschi, 1990). As a result, and in line with previous research using these data (Schreck, Fisher, & Miller, 2004), a maternal attachment measure was included in the analysis. During wave 1 interviews, adolescents were asked two questions tapping maternal attachment: how close they feel to their mother and their perceptions of how much their mother cares about them. Responses to these two questions were added together to create the maternal attachment scale, where higher values reflect greater levels of maternal attachment ( $\alpha = 0.64$ ).

**2.2.3.4. Maternal involvement.** Findings from a large body of research have shown maternal-child involvement to be associated with delinquent and criminal behaviors (Loeber & Stouthamer-Loeber, 1986). As a result, a maternal involvement index was included in the analyses. Specifically, during wave 1 interviews respondents were asked to report on their involvement with their mothers on ten different activities. For instance, youth were asked whether they had gone shopping with their mother, played a sport with their mother, or went to a museum with their mother during the previous four weeks. Similar to previous research (Crosnoe & Elder, 2004), responses to these items were coded dichotomously, such that 0 = no and 1 = yes. These responses were then summed together to create the maternal involvement index ( $\alpha = 0.55$ ).

**2.2.3.5. Parental permissiveness.** Research has documented the importance of parental monitoring and supervision on adolescent development (Gottfredson & Hirschi, 1990). Against this backdrop, a parental permissiveness scale was included in the analyses. During wave 1 interviews, youth were asked seven questions related to the degree of autonomy afforded to them by their parents. Adolescents, for instance, were asked whether they had any influence on issues related to their choice of friends and their bedtimes. In line with previous research (Barnes & Morris, 2012), responses to these questions were coded dichotomously, such that 0 = no and 1 = yes. Item responses were then summed together to create the parental permissiveness index, with higher scores representing greater levels of parental permissiveness ( $\alpha = 0.63$ ).

**2.2.3.6. Social support.** There is some evidence to indicate that high levels of social support help to promote prosocial development and to reduce involvement in risky and antisocial behaviors (Cullen, 1994). To account for this possibility, a social support scale was included in the analyses. During wave 1 interviews, youth were asked eight questions that tapped the amount of social support that they received from teachers, peers, and family members. For instance, they were asked whether their family pays attention to them, how much they want to leave home, and whether people in their family understand them. Responses to these items were coded as follows: 1 = not at all, 2 = very little, 3 = somewhat, 4 = quite a bit, and 5 = very much. These responses were then summed together to create the social support scale, where higher values represent greater levels of social support ( $\alpha = 0.71$ ).

## 2.2.4. Individual differences

**2.2.4.1. Low self-control.** Low levels of self-control have been shown to



**Table 1**  
Binary logistic regression models predicting aging out of nonviolent delinquency.

	Wave 2		Wave 3		Wave 4	
	b	OR	b	OR	b	OR
Socialization measures						
Delinquent peers	−0.022 (0.02)	0.937–1.022	−0.007 (0.02)	0.959–1.028	−0.015 (0.02)	0.948–1.024
Maternal disengagement	−0.004 (0.02)	0.954–1.041	0.007 (0.02)	0.972–1.043	0.020 (0.02)	0.982–1.061
Maternal attachment	−0.106 (0.06)	0.804–1.006	0.087 (0.05)	0.990–1.202	0.097 (0.05)	0.995–1.220
Maternal involvement	0.002 (0.03)	0.942–1.065	0.010 (0.03)	0.962–1.060	−0.013 (0.03)	0.935–1.042
Parental permissiveness	−0.048 (0.04)	0.882–1.030	−0.004 (0.03)	0.934–1.062	−0.037 (0.04)	0.897–1.036
Social support	0.036 (0.02)	1.002–1.074	−0.015 (0.01)	0.972–0.998	−0.026 (0.02)	0.961–0.989
Individual differences						
Low self-control	−0.008 (0.01)	0.975–1.008	−0.015 (0.01)	0.972–0.998	−0.026 (0.01)	0.961–0.989
Intelligence	−0.010 (0.00)	0.982–0.999	−0.012 (0.00)	0.981–0.995	−0.003 (0.00)	0.989–1.005
Control variables						
Gender	0.060 (0.13)	0.825–1.367	−0.968 (0.11)	0.309–0.467	−0.617 (0.12)	0.429–0.679
Age	0.166 (0.04)	1.083–1.287	0.121 (0.03)	1.058–1.205	0.126 (0.04)	1.055–1.219
Nonwhite	−0.100 (0.13)	0.699–1.172	−0.087 (0.11)	0.745–1.128	−0.325 (0.12)	0.576–0.906
Public assistance	0.122 (0.20)	0.762–1.675	0.050 (0.18)	0.737–1.499	0.168 (0.20)	0.800–1.747
Cox and Snell R-squared	0.02		0.06		0.03	
N	2112		2058		2225	

among the strongest and most robust predictors of a wide array of antisocial, criminal, and delinquent behaviors (Pratt & Cullen, 2000). As a result, a low self-control scale was included in the analyses. During wave 1 interviews, adolescents were asked 23 questions that tapped variation in levels of self-control. Youth, for instance, were asked whether they have trouble paying attention at school, whether they have trouble keeping their mind focused, and whether they go with their “gut feelings” without reflecting too much on the consequences. Responses to these items were then summed together to create the low self-control scale, where higher values represent lower levels of self-control ( $\alpha = 0.76$ ). This same scale has been used previously by researchers analyzing the Add Health data (Beaver, Ratchford, & Ferguson, 2009).

**2.2.4.2. Intelligence.** During wave 1 interviews, respondents were administered the Picture Vocabulary Test (PVT) which is an abridged version of the Peabody Picture Vocabulary Test. Scores on this test index verbal aptitude and receptive vocabulary and previous research has shown that scores on this test are correlated with scores on other tests designed to measure intelligence, such as the Wechsler Adult Intelligence Scale (WAIS; Bell, Lassiter, Matthews, & Hutchinson, 2001; Dunn & Dunn, 1997). Moreover, previous researchers analyzing the Add Health have used this same measure to account for intelligence (Rowe, Jacobson, & van den Oord, 1999).

#### 2.2.5. Control variables

**2.2.5.1. Gender.** Gender was included in the analyses as a dichotomous dummy variable, where 0 = female and 1 = male.

**2.2.5.2. Age.** Age was included as continuous variable and was measured as the respondent's age during wave 1 interviews.

**2.2.5.3. Race.** Race was included as a dichotomous dummy variable

based on self-reported race at wave 1, where 0 = Caucasian and 1 = nonwhite.

**2.2.5.4. Public assistance.** Public assistance was measured by a single question asked to the primary caregiver indicating whether the family had received any type of public assistance. This question was coded such that 0 = received no public assistance and 1 = received public assistance.

#### 2.2.6. Plan of analysis

In order to estimate the factors that might be involved in aging out of delinquency, it was important to identify a subsample of respondents who were involved in delinquency at wave 1. Since respondents at wave 1 were near the peak of their offending years (i.e., adolescence), we did not want to simply include respondents who had participated in any delinquent act as a vast majority of adolescent's engage in at least some form of delinquency (Moffitt, 1993). As a result, we opted to employ a more rigorous approach by identifying youth who were in approximately the 75th percentile of offending. In doing so, we analyzed nonviolent delinquency, violent delinquency, and total delinquency separately. For nonviolent delinquency, the 75th percentile corresponded to a score of 4 or greater on the nonviolent delinquency scale, for violent delinquency, the 75th percentile corresponded to a score of 2 or greater on the violent delinquency scale, and for total delinquency, the 75th percentile corresponded to a score of 5 or greater.

Aging out of nonviolent delinquency, violent delinquency, and total delinquency was analyzed separately. To do so, only respondents who scored in the top 75th percentile of each respective delinquency scale were included in the analysis. So to predict the odds of aging out of nonviolent delinquency, only respondents who scored 4 or greater on the nonviolent delinquency scale were retained for those analyses. Then, binary logistic regression models were estimated to predict the

odds of aging out for each wave-specific measure (in this case, aging out of nonviolent delinquency at each wave). Recall that the aging out measures were created at each wave to index complete abstention from delinquent involvement at each wave. As a result, the logit models were analyzing a sample of the most delinquent adolescents at wave 1 and then predicting wave-specific aging out at waves 2, 3, and 4. This same process was then employed to estimate aging out of violent delinquency and total delinquency.

### 3. Results

The analysis began by examining the factors that predict aging out of nonviolent crime and delinquency. Table 1 contains the results of these binary logistic models. The first model in the table presents the results for wave 2 aging out. Recall that this model is predicting whether the adolescent refrained from involvement in any type of nonviolent delinquency at wave 2 (the measure is coded, such that aging out = 1, not aging out = 0). Of the socialization measures, only social support emerged as statistically significant, wherein adolescents with higher levels of social support had an increased odds of aging out. Intelligence also emerged as a statistically significant predictor of aging out, but interestingly the association was negative, meaning that higher scores on intelligence were related to a reduction in the odds of aging out. Of the control variables, only age was a significant predictor of wave 2 aging out.

The next column of Table 1 contains the results of the models predicting aging out of nonviolent delinquency at wave 3. Once again social support was a significant predictor of delinquency, but the effect in this model was negative, indicating that adolescents with higher levels of social support were less likely to age out. In contrast to the first model, low self-control emerged as a significant predictor of the aging out process, wherein adolescents with lower self-control were less likely to age out. As with the previous model, both intelligence and age were significantly related to aging out as too was gender, with females being more likely to age out than males.

The last model in Table 1 shows the results for wave 4 aging out and the results are strikingly similar to those generated in the previous model. Social support, low self-control, gender, and age all maintained statistically significant associations with the odds of aging out and all were in the same direction as the previous model. Unlike the previous model, intelligence was no longer related to the odds of aging out at wave 4.

We next turn our attention to the models predicting aging out of violent delinquency. The results of these models are presented in Table 2 and the models estimated are identical to those estimated for nonviolent delinquency. In the first column are the results generated using the wave 2 aging out variable. As can be seen, delinquent peers was the only socialization measure to emerge as a statistically significant predictor of the aging out process. In this case, adolescents who reported greater numbers of delinquent peers were less likely to age out of violent delinquency when compared to adolescents with fewer delinquent peers. In addition, adolescents with lower levels of self-control were also less likely to age out of violent delinquency. Of the control variables, gender and age were related to the odds of aging out, with females and older adolescents being more likely to age out.

The next model of Table 2 contains the results predicting aging out of violent delinquency at wave 3. In line with the previous model, delinquent peers was related to the odds of aging out as was gender and age. Low self-control, however, dropped from statistical significance, but maternal involvement emerged as a significant predictor of aging out at wave 3. The effects of maternal involvement were opposite of what would be anticipated: adolescents who reported higher levels of maternal involvement had a reduced odds of aging out of violent delinquency.

The results predicting aging out of violent delinquency at wave 4 are contained in the next model. In this model, delinquent peers is the

only socialization variable to predict the odds of aging out at wave 4. Neither of the individual differences measures were related to the odds of aging out, but gender, age, and nonwhite emerged as statistically significant predictors. In this model, females, older adolescents, and respondents who self-identified as white all had a higher odds of aging out than their counterparts.

Lastly, Table 3 contains the results of models predicting aging out of total delinquency—that is, both nonviolent and violent delinquency. The first model shows that delinquent peers was inversely related to the odds of aging out as was intelligence. Keep in mind that while the effect of delinquent peers was in the expected direction, the effect of intelligence was in the opposite direction (i.e., higher levels of intelligence were related to a reduced odds of aging out). Of the control variables included in the model, only age was related to the odds of aging out.

The second model of Table 3 shows the results for aging out at wave 4. In this model, low self-control and intelligence were negatively related to the odds of aging out, meaning that adolescents with lower self-control and higher intelligence had reduced odds of aging out. Two control variables—gender and age—were related to the odds of aging out, with females (in comparison with males) and older respondents being more likely to age out at wave 3.

The last model of Table 3 shows the results of the model predicting aging out of nonviolent and violent delinquency at wave 4. As can be seen, low self-control, gender, age, and nonwhite were the only covariates to predict the odds of aging out at wave 4. Specifically, youth with higher levels of self-control, youth who were female, youth who were older, and youth who were white had higher odds of aging out.

### 4. Discussion

Perhaps the most consistently replicated finding in all of criminology is the age-crime curve (Farrington, 1986; Hirschi & Gottfredson, 1983). The inverted-U relationship between age and crime has been detected across time, across space, and across studies. What is particularly interesting, however, is that there is a lack of consensus regarding what accounts for this finding or for why most adolescents—even those who were heavily engaged in delinquency—tend to refrain from criminal behavior during adulthood. Certainly theories and explanations have been advanced (e.g., Moffitt, 1993), but studies have failed to identify the causal mechanism(s) that are completely able to explain the age-crime curve in all time periods, cultures, and nations. The current study used this as a backdrop to examine some of the potential factors that might help to explain the reduction in offending that occurs between adolescence and adulthood for youth who were previously involved in delinquency—that is, the aging out process. The results of this study revealed three broad findings.

First, in respect to aging out of nonviolent delinquency there was a general lack of statistically significant results. Across all of the socialization measures, the only measure to emerge as statistically significant was social support. And, even here, the results were somewhat shaky as social support increased the odds of aging out at wave 2, but decreased them at wave 4. Importantly, self-control was the most consistent predictor of aging out, where lower self-control reduced aging out of nonviolent delinquency at waves 3 and 4.

Second, for violent delinquency, again there was a general lack of statistically significant findings. None of the family or parenting measures were consistently related to aging out of violent delinquency, but delinquent peers had a consistent effect across all of the models. Adolescents with fewer delinquent peers were more likely to age out of violent delinquency when compared to adolescents with greater numbers of delinquent peers. In contrast to the previous model, neither of the individual differences measures had any consistent effects across the models.

The last key set of findings were those that pertained to the models predicting aging out of total delinquency. As with the previous models,

**Table 2**  
Binary logistic regression models predicting aging out of violent delinquency.

	Wave 2		Wave 3		Wave 4	
	b	OR	b	OR	b	OR
Socialization measures						
Delinquent peers	−0.114 (0.02)	0.864–0.921	−0.051 (0.02)	0.914–0.987	−0.039 (0.02)	0.928–0.997
Maternal disengagement	−0.004 (0.02)	0.964–1.028	0.009 (0.02)	0.970–1.050	0.011 (0.02)	0.976–1.049
Maternal attachment	0.020 (0.02)	0.933–1.115	0.050 (0.06)	0.940–1.177	0.092 (0.04)	0.999–1.204
Maternal involvement	0.001 (0.02)	0.961–1.043	−0.077 (0.03)	0.880–0.974	−0.017 (0.02)	0.937–1.031
Parental permissiveness (0.03)	0.018	0.964–1.074 (0.04)	−0.009	0.926–1.061 (0.03)	−0.032	0.910–1.032
Social support	0.018 (0.01)	0.995–1.041	0.013 (0.02)	0.985–1.043	0.014 (0.01)	0.988–1.041
Individual differences						
Low self-control	−0.018 (0.01)	0.971–0.994	−0.014 (0.01)	0.973–1.000	−0.008 (0.01)	0.979–1.005
Intelligence	−0.002 (0.00)	0.992–1.004	0.001 (0.00)	0.993–1.009	0.002 (0.00)	0.994–1.009
Control variables						
Gender	−0.379 (0.09)	0.572–0.819	−1.455 (0.13)	0.179–0.303	−0.535 (0.11)	0.474–0.725
Age	0.190 (0.03)	1.033–1.159	0.156 (0.04)	1.091–1.252	0.122 (0.03)	1.060–1.206
Nonwhite	−0.099 (0.09)	0.758–1.082	−0.198 (0.11)	0.657–1.025	−0.320 (0.10)	0.592–0.889
Public assistance	−0.113 (0.13)	0.696–1.146	−0.207 (0.16)	0.594–1.12	−0.241 (0.14)	0.593–1.042
Cox and Snell R-squared	0.04		0.06		0.02	
N	2513		2402		2553	

**Table 3**  
Binary logistic regression models predicting aging out of total delinquency.

	Wave 2		Wave 3		Wave 4	
	b	OR	b	OR	b	OR
Socialization measures						
Delinquent peers	−0.047 (0.02)	0.913–0.996	−0.025 (0.02)	0.945–1.007	−0.012 (0.02)	0.958–1.019
Maternal disengagement	−0.024 (0.02)	0.934–1.021	0.007 (0.02)	0.975–1.040	0.001 (0.02)	0.971–1.032
Maternal attachment	−0.090 (0.06)	0.813–1.027	0.072 (0.05)	0.983–1.176	0.074 (0.04)	0.991–1.170
Maternal involvement	−0.030 (0.03)	0.914–1.029	−0.020 (0.02)	0.939–1.024	−0.023 (0.02)	0.936–1.019
Parental permissiveness	−0.049 (0.04)	0.883–1.027	0.001 (0.03)	0.944–1.061	−0.056 (0.03)	0.893–1.001
Social support	0.050 (0.02)	1.016–1.087	−0.013 (0.01)	0.962–1.012	0.014 (0.01)	0.990–1.039
Individual differences						
Low self-control	−0.009 (0.01)	0.976–1.008	−0.014 (0.01)	0.975–0.998	−0.014 (0.01)	0.975–0.998
Intelligence	−0.014 (0.00)	0.977–0.994	−0.010 (0.00)	0.984–0.997	0.001 (0.00)	0.995–1.007
Control variables						
Gender	−0.034 (0.13)	0.751–1.243	−1.067 (0.10)	0.285–0.416	−0.671 (0.09)	0.426–0.613
Age	0.123 (0.04)	1.041–1.228	0.127 (0.03)	1.071–1.204	0.135 (0.03)	1.081–1.212
Nonwhite	−0.071 (0.13)	0.725–1.197	−0.100 (0.10)	0.751–1.090	−0.372 (0.09)	0.576–0.825
Public assistance	−0.137 (0.19)	0.598–1.270	0.030 (0.15)	0.768–1.382	−0.105 (0.14)	0.685–1.184
Cox and Snell R-squared	0.02		0.07		0.03	
N	2506		2401		2605	

there was a lack of statistically significant findings for the family and parenting measures. The measure of delinquent peers predicted aging out of total delinquency at wave 2, but not at either of the two following waves. Moreover, low self-control reduced the odds of aging out at waves 3 and 4, but not wave 2. Lastly and perhaps most curiously, intelligence was inversely related to aging out at all three waves, but the effect was in the opposite direction: adolescents with higher intelligence scores were less likely to age out of total delinquency.

Across the calculated statistical models, there were obviously very few consistent factors that led to aging out. The question, of course, is what accounts for the overall pattern of null findings, particularly when such a wide range of variables were included which had previously been shown to be important to delinquent and criminal involvement as well as to changes in criminal offending behaviors in some studies (Bersani & Doherty, 2018; Laub & Sampson, 2003; Ragan & Beaver, 2010). While admittedly speculative, we do offer one reason. As noted previously, the age-crime curve has been reproduced on virtually every data ever recorded. Given that the age-crime curve is a universal finding, perhaps the downward shift in criminal behavior at the end of adolescence and beginning of adulthood is just part of normal, human development that occurs regardless of social-environmental factors or individual differences (Hirschi & Gottfredson, 1993). While certainly there are some variables that might contribute slightly to the process (e.g., exposure to delinquent peers), the effects might be so small in comparison with the developmental process at play that they could be considered relatively inconsequential. Moreover, this normal developmental process might be more pronounced for adolescents who are engaged in delinquent behaviors that are relatively age-normative and are not chronically violent. The fact that the analyses for this study were based off of a school-based sample where most adolescent offenders are not hardened, chronic offenders (even those in the top 75th percentile of the delinquency scales) would lend support to this view. It would be interesting to examine whether a similar pattern of findings would be detected for samples of incarcerated youth or for adolescents who had a long history of criminal violence.

The results of the current study should be viewed with caution due to a number of limitations. First, as noted above, the data were drawn from a school-based sample. On the one hand, this is a positive as most youth attend school and thus the age-crime curve would be driven largely by school-attending youth. On the other hand, however, this study was unable to address whether the same pattern of results would have been detected if a high-risk sample of incarcerated youth were also included in the data. Second, all of the measures included in the analyses were based on self-reports. As a result, there could be issues with shared methods variance that could bias the interrelationships among the covariates. Given the general lack of statistically significant findings, however, it seems unlikely that shared methods variance is driving the results. Nonetheless, future studies would benefit by examining such measures using multiple reporting sources, official crime data, and perhaps even observational measures. Third, while the data span nearly 13 years of development, there were no items relating to antisocial behavior in childhood nor were there any items beyond early adulthood. It would be interesting to determine whether these findings would remain robust when examining antisocial, delinquent, and criminal behavior from childhood through at least mid-adulthood. Until these shortcomings are addressed, the robustness of the reported results remains unknown.

Understanding the reasons why offending behaviors decrease so rapidly and so widely in late adolescence and early adulthood is critical for two key reasons. First, the more we understand about this process, the more that criminological and developmental theories can be tailored to account for this section of the life course. The end result will be theories that are more fully specified, more accurate, and better able to predict the unfolding of lives for both offenders and nonoffenders. Second, and perhaps even more important, if an accurate understanding of the factors that account for aging out of delinquency are in place,

then perhaps that knowledge can be harnessed and used to develop and implement delinquency-prevention and/or treatment programs for the highest-risk offenders (e.g., adolescents who would have become LCP offenders). In other words, perhaps this information could be used to “force” a normal, developmental process onto those youth who are on a lifelong antisocial trajectory. Of course, the effectiveness of all of this will depend, in large part, on future studies that are able to provide additional insight into why most adolescent delinquents age out of criminal behavior.

## Acknowledgements

This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

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