



Early starters: Which type of criminal onset matters most for delinquent careers?

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ARTICLE INFO

Available online xxxx

ABSTRACT

Background: Across multiple conceptual models in the social and behavioral sciences, the onset of antisocial behavior is inversely related to the developmental course and severity of the delinquent career. Despite this relation, there is little agreement about the best way to measure early onset.

Materials and methods: Data are derived from a non-probability sample of 252 boys and girls adjudicated and placed in private long-term residential placement facilities in Pennsylvania. Descriptive, negative binomial regression models, and t-tests were used to examine the effects of antisocial behavioral onset, police contact/arrest onset, and juvenile court referral onset on various aspects of the delinquent career.

Results: Arrest onset was most consistently related to antisocial outcomes including two models for career arrests and two models for self-reported delinquency. Antisocial behavioral onset was associated with psychopathic personality in both models. Juvenile court referral onset was not significantly associated with any parameter of the delinquent careers. Youths with ADHD or CD diagnoses experienced earlier onset than their peers without these disorders, and the effects for more consistent for ADHD.

Conclusion: Police contact/arrest onset emerged as the most consistent indicator of delinquent career severity.

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Introduction

Few pieces of information are as important for understanding an individual's antisocial behavior career and psychopathology as the emergence, initiation, or onset of antisocial behavior. Across an array of conceptual models in psychology, developmental psychopathology, psychiatry, and criminology (Barker, Oliver, & Maughan, 2010; DeLisi & Piquero, 2011; DiLalla & Gottesman, 1989; Eme, 2009; Moffitt, 1993; Moffitt & Caspi, 2001; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998; Quay, Routh, & Shapiro, 1987), there are important distinctions made between those whose problem behaviors occur early in life, such as during childhood versus those whose problem behaviors occur later in life, such as during adolescence or adulthood (for reviews, see Lochman, Powell, Boxmeyer, Young, & Baden, 2010; Loeber & Farrington, 2001; Moffitt, Arseneault, Jaffee, Kim-Cohen, Koenen, et al., 2008). Compared to late starters, early starters are often raised in home environments characterized by multiple forms of family dysfunction, are more likely to display temperamental and self-regulatory deficits, are prone to eliciting and engaging in aversive social interactions, are likely to evince more serious and more

sustained conduct problems, and are more likely to experience early contact by and involvement in the juvenile justice system (Barnes & Boutwell, 2012; Calkins & Keane, 2009; DeLisi, 2006; DeLisi et al., 2008; DeLisi & Vaughn, 2011; Eme, 2009; Loeber & Farrington, 2001; Lynam, 1996; Murray, Irving, Farrington, Colman, & Bloxson, 2010). Although there are of course exceptions, the general rule is that the more antisocial the individual, the earlier the onset of antisociality.

In accord to its empirical importance, criminal onset has been linked to a variety of behavioral, psychological, and dispositional outcomes including worse physical and mental health (de Boer, van Oort, Donker, Verheij, & Boon, 2012; Schroeder, Hill, Haynes, & Bradley, 2011), homicide offending (Behnken et al., 2011; DeLisi et al., 2011; Vaughn et al., 2009, 2011), sexual offending (Cale & Lussier, 2011; Carpentier, Leclerc, & Proulx, 2011), violent crime and weapons offenses (McCluskey, McCluskey, & Bynum, 2006), pathological offending (Berg & DeLisi, 2006; Huesmann, Dubow, & Boxer, 2009), and others. Given the theoretical and empirical heft of onset, it is routinely used as an independent variable in multivariate models relating to problem behaviors and delinquency over the life course. As DeLisi and Piquero (2011, p. 290) suggested, "It is axiomatic that criminal career extremity is inversely related to onset, and the demarcation of a childhood-onset of conduct problems is central to the psychiatric diagnosis of behavioral disorders, theorization in the social and behavioral sciences, and the scholarly study of individual crime patterns." In this way, most studies of offending careers include some indicator of when the career began.

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Although the use of onset as a predictor variable is commonplace, there is little agreement among scholars about the operationalization of onset (Loeber & Farrington, 2001; Moffitt et al., 2008). In pediatric and developmental psychopathology research, for instance, constructs such as negative emotionality, difficult temperament, self-regulation deficits, or aggression are commonly used as indicators of precocious problem behaviors. Unfortunately, the display of negative emotions and aggression during infancy, toddlerhood, and early childhood are nearly ubiquitous, thus using these as a marker of antisocial onset likely results in many false positives and false negatives. In psychology and particularly criminology, it is more common to use initial contact with juvenile justice agents, such as law enforcement or the juvenile court, as indicators of criminal onset. While this approach has strengths (e.g., youth who are the most extreme in their antisocial behavior are most likely to be contacted by police), it also suffers from potential weaknesses relating to labeling and selection biases among juvenile justice practitioners. Moreover, it is understood that an individual's first arrest almost never coincides in time and place with their antisocial behavioral onset. In this way, arrest or juvenile court onset is usually a delayed proxy for the "true" onset of antisocial behavior (Moffitt et al., 2008). Among the various ways to measure the emergence of antisocial behavior: Which has the strongest linkage to a youth's delinquent career?

Study aim

The current study sought to specify the onset-crime relationship using three measures of antisocial onset—onset of rule-breaking/law violation, onset of police contact/arrest, and onset of juvenile court referral—and their association with various antisocial outcomes among a sample of institutionalized juvenile delinquents selected from private residential placement facilities in Pennsylvania. This provides a "head-to-head" test of various specifications of onset to see which is most consistently associated with aspects of the delinquent career.

Method

Participants and procedures

The data are derived from a non-probability sample of adolescent youths in two (one male only and one female only) private non-profit long-term residential placement facilities for juvenile offenders in Western Pennsylvania (Shook, Vaughn, Goodkind, & Johnson, 2011). Data collection at the boys' facility occurred from June 2009 through August 2009 (N = 152). Criteria for boys being enrolled in the study included being between 14 and 18 years old and having been in the facility between 3 and 12 months when recruitment started. Data collection at the girls' facility occurred over a 4-month period from October 2009 until February 2010. This facility is much smaller than the boys' facility so we attempted to include all the young women in the facility and all of those that entered during the data collection period (N = 100).

The boys and girls in this sample are extensively involved in diverse forms of antisocial conduct and have commensurately extensive juvenile justice histories. In terms of mean levels of delinquency and youth violence, the modal youth in the current sample committed more than 15 acts of delinquency and nearly nine acts of serious violence, such as gang fighting, hitting a teacher, hitting a parent, hitting other students, and attacking another person in the prior year. Approximately 70% of the sample was drug sellers and 64% of youths who reported drug sales indicated that they sold drugs on a daily basis (Shook et al., 2011). Most importantly for the current study, the survey instrument contained three measures of antisocial onset which allowed an

empirical investigation of whether the operationalization of onset produced different information about the delinquent career.

Data were collected in accordance with protocols approved by the Institutional Review Board at the University of Pittsburgh. After the study was described by facility staff and the youth expressed interest, a supervisor at the facilities provided approval for the youth to take part in the study and the youth were referred to research staff. Prior to administering the instrument, the interviewer explained the purpose of the study and received assent from each youth (consent from those 18 and 19 years old). Structured one-on-one interviews were carried out by trained graduate students using Computer-Assisted Survey Interview (CASI) techniques. Interviewers completed an intensive one-day training session and an interview editor was on-site as youth were interviewed to minimize interviewer omissions and errors.

All interviews were conducted in rooms that provided private areas where confidential interviews could be conducted simultaneously with between three to five youth. The CASI data collection procedures allowed the respondent to have each question read to them supplemented by response cards. There was an on-site data editor free during the interviews to help answer any questions and provide quality control to data collection procedures. Youth were sent to the facilities for a variety of property, person, drug, and status offenses. The vast majority of youth reported a history of involvement in delinquent behavior and the juvenile court spanning several years. Overall, more than 95% of those referred to the research team assented to and completed the interview at both facilities. Overall, the characteristics of the study sample are representative of previous studies of residentially incarcerated youth nationally with regard to average age, race and ethnicity, and offense histories and in terms of their social, behavioral, and delinquency histories (Blomberg et al., 2011; de Boer et al., 2012; Reynolds, Tarter, Kirisci, & Clark, 2011; Sickmund, 2004; Trulson, Haerle, DeLisi, & Marquart, 2011; Trulson et al., 2012).

Measures

Onset

Three measures of onset were used: antisocial behavior onset, police contact/arrest onset, and juvenile court referral onset. For *antisocial behavior onset* (M = 12.02 years, SD = 2.76, Range = 5–17), participants were asked "How old were you when you first violated any of the above rules or laws?" The list refers to the Self-Report of Delinquency (SRD). This measure assesses violent and non-violent delinquent offending in the twelve months prior to residential placement. The SRD version employed was modeled after a similar measure used in the National Youth Survey (Elliott, Huizinga, & Menard, 1989). Delinquent items include a range of property, drug, violent, offenses. For *police contact/arrest onset* (M = 12.82, SD = 2.26, Range = 5–17), participants were asked "How old were you when you had your first contact with the police?" For *juvenile court referral onset* (M = 14.00, SD = 1.73, Range = 9–17), participants were asked "At what age were you first referred to the juvenile court?" The three onset measures were significantly correlated: $r_{\text{antisocial behavior-arrest}} = .51$, $r_{\text{antisocial behavior-juvenile court referral}} = .47$, $r_{\text{arrest-juvenile court referral}} = .60$. A zero-order correlation matrix for all study variables appears in the Appendix A.

Dependent variables

Total arrests

Total arrests is a summary measure of the number of police contacts prior to the instant offense for which the youth was committed (M = 3.73, SD = 4.00, Range = 0–32).

Self-reported delinquency

As indicated above, the SRD version employed was modeled after a similar measure used in the National Youth Survey (Elliott et al., 1989) to create a total self-reported delinquency measure ($M = 15.29$, $SD = 13.16$, $Range = 0-65$). The delinquency items include motor vehicle theft, theft over \$50, bought or sold stolen goods, stolen marijuana or other drugs, carrying a hidden weapon, gang fighting, hitting a teacher, hitting a parent, hitting other students, strong arming students, parents, and teachers, hitting an animal, and attacking someone. Items are assessed as counts using a scale of 0 = Never, 1 = 1-2 times in the last year, 2 = 1 time every 2-3 months, 3 = 1 time a month, 4 = 1 time every 2-3 weeks, 5 = 1 time a week, 6 = 2-3 times per week, 7 = 1 time a day, and 8 = 2-3 times a day.

Youth Psychopathic Inventory (YPI) total score

Psychopathy is a personality disorder characterized by deficits in interpersonal, affective, behavioral, and lifestyle areas and is an important correlate of conduct problems, delinquency/crime, and juvenile/criminal justice involvement (DeLisi, 2009; Ribeiro da Silva, Rijo, & Salekin, 2012; Vaughn & Howard, 2005). Psychopathy was assessed using the Youth Psychopathic Traits Inventory (YPI; Andershed, Kerr, Stattin, & Levander, 2002) total score ($M = 105.74$, $SD = 20.92$, $Range = 53-189$). Reliability and validity of this instrument in assessing psychopathic features in children and adolescents is strong (Vaughn, Howard, & DeLisi, 2008).

ADHD diagnosis or CD diagnosis

Youth in the current sample displayed high comorbidity of psychiatric symptoms with 95 youth reporting an ADHD diagnosis and 35 youth reporting a CD diagnosis. In the t-tests component of the analysis, youth with these disorders were compared on onset measures to their peers without these diagnoses.

Control variables

Given the relevance of core demographic characteristics such as sex, age, and race to offending careers and antisociality (DeLisi, 2005; Sorensen & Davis, 2011; Varano, Huebner, & Bynum, 2011), these were included as control variables. Sex was dichotomously coded (0 = female, 1 = male) with 40% of the sample female and 60% male. Age was continuously coded ($M = 14.39$, $SD = 5.39$, $Range = 15.98$, $SD = 1.42$, $Range = 13-19$). For race, 52% of the sample was African American and 23% was white.

Analysis

A three-part analytic approach was used. First, univariate statistics describing the distribution of the three types of onset are provided. Second, negative binomial regression models were performed to examine the association between the three forms of onset and total arrests, self-reported delinquency, and the total score on the YPI. Negative binomial regression models were used because the dependent variables are counts (e.g., arrests, delinquent acts, psychopathic personality symptoms) where the distribution is overdispersed by higher values of the distribution and the variance exceeds the mean. Negative binomial regression is an extension of Poisson regression which similarly estimates count-based outcome variables, but when the mean and variance are equal. Likelihood ratio tests of alpha indicated that negative binomial regression was the appropriate method for all models. Third, differences of means t-tests were performed to examine onset differences among youth with Attention-Deficit/Hyperactivity Disorder (ADHD) and Conduct Disorder (CD), disorders

Table 1
Distribution of antisocial behavior onset (n = 245)

Age	Frequency	Percent	Cumulative Percent
5	3	1.22	1.22
6	10	4.08	5.31
7	10	4.08	9.39
8	8	3.27	12.65
9	11	4.49	17.14
10	21	8.57	25.71
11	27	11.02	36.73
12	33	13.47	50.2
13	44	17.96	68.16
14	32	13.06	81.22
15	27	11.02	92.24
16	14	5.71	97.96
17	5	2.04	100

Table 2
Distribution of police contact/arrest onset (n = 250)

Age	Frequency	Percent	Cumulative Percent
5	2	0.80	0.8
6	0	0	0.8
7	5	2	2.8
8	5	2	4.8
9	6	2.4	7.2
10	21	8.4	15.6
11	23	9.2	24.8
12	37	14.8	39.6
13	43	17.2	56.8
14	46	18.4	75.2
15	39	15.6	90.8
16	19	7.6	98.4
17	4	1.6	100

that have been shown to be associated with conduct problems and delinquency.

Findings

Distribution of onset types

Tables 1–3 contain descriptive statistics about the distribution of the three forms of criminal onset. The emergence of rule-breaking behaviors is early among these institutionalized delinquents. As shown in Table 1, more than 25% of the sample reported criminal onset by age 10 years. By age 14 years, more than 81% of the sample self-reported that they had broken legal rules. The modal rule-breaking onset was age 13 years. Table 2 displays the distribution of police contact/arrest onset. More than 15% of the sample had been arrested by age 10 years. The bulk of first arrests occurred at age 13 years (17.2% of sample), age 14 years (18.4% of sample), or

Table 3
Distribution of Juvenile court referral onset (n = 247)

Age	Frequency	Percent	Cumulative Percent
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	2	0.81	0.81
10	8	3.24	4.05
11	12	4.86	8.91
12	23	9.31	18.22
13	48	19.43	37.65
14	43	17.41	55.06
15	60	24.29	79.35
16	42	17	93.36
17	9	3.64	100

age 15 years (15.6% of sample). Table 3 contains the distribution of juvenile court referral. Zero youth were first referred to court through age 8 years. By age 11 years, nearly 9% of the youths had been formally processed by the juvenile court. Expectedly, the modal juvenile court onset years were age 13 years (19.4% of sample), age 14 years (17.4% of sample), or age 15 years (24.3% of sample)—the same as arrest onset.

Negative binomial regression models

Negative binomial regression models (shown in Table 4) display total arrests, self-reported delinquency, and YPI total score regressed on the three forms of criminal onset, gender, age, and white and black racial status. For each dependent variable, two models were run. The first contains only the onset variables and the second model includes the demographic controls. In none of these equations did significant onset effects fall from significance once demographics were controlled. Police contact or arrest onset was the only significant predictor of total arrests (an official measure of the antisocial career) and self-reported delinquency (a self-reported measure of the antisocial career). Neither rule-breaking onset nor juvenile court referral onset predicted these outcomes. For psychopathic personality features, only rule-breaking onset was associated with total score on the YPI. The juvenile justice forms of onset were not associated with YPI total score. Interestingly, none of the demographic covariates were associated with total arrests, self-reported delinquency, or psychopathic personality.

Onset and neurobehavioral disorders

The final part of the analysis examines onset differences among youth with ADHD or Conduct Disorder compared to their peers without these disorders. As shown in Table 5, youth with ADHD evinced significantly earlier antisocial onset than youth without ADHD. Children with ADHD first broke rules 1.1 years earlier ($t = 2.76, p < .01$), were first contacted by police 1.3 years earlier ($t = 3.42, p < .01$), and were first referred to the juvenile court 0.8 years earlier ($t = 2.65, p < .01$). For Conduct Disorder, only arrest onset significantly differentiated those with and without the disorder. Youths with CD had an arrest onset that occurred 0.9 years earlier ($t = 2.12, p < .05$) than those without CD. Overall, children and adolescents with CD displayed the earlier average onset across all three types (11.6 years for rule breaking, 12 years for arrest, and 13.6 years for juvenile court referral).

Discussion

In a review of research on Conduct Disorder for the DSM-V, Moffitt and her colleagues (2008, p. 6, references omitted, italics added) observed that, “the age of onset of conduct problems is generally recalled as years later than it truly was (telescoping). Official records of age at first police arrest also lag 2 to 5 years behind true age at first illegal act. “Good age-of-onset information is hard to get.” In other words, it is clear that there are many ways to measure the beginning of a delinquent career, and scholars across disciplines have devised a variety of ways to operationalize onset. The current findings attest to the importance of criminal onset and how various specifications of antisocial onset are differentially associated with antisocial behavior. Three main findings particularly warrant discussion.

First, the current data are based on a correctional sample of youth who variously reported delinquent offenses and/or becoming embroiled in the juvenile justice system at tragically young ages of 5, 6, 7, 8, 9, or 10 years. Compared to normatively-behaved children who are involved in mostly prosocial elementary school activities, early starters displayed multiple problem behaviors—behaviors that were frequently serious enough to attract the attention of the police and the juvenile court. This finding was completely anticipated by

Table 4
Negative binomial regression models for (1) total arrests, (2) self-reported delinquency, and (3) YPI total score

Variable	(1)			(2)			(3)		
	b (SE)	z	b (SE)	z	b (SE)	z	b (SE)	z	
Antisocial Behavior Onset	-.007 (.023)	-0.32	-.005 (.024)	-0.23	-.036 (.026)	-1.36	-.037 (.026)	-1.41	
Police Contact/Arrest Onset	-.099 (.031)	-3.13***	-.095 (.032)	-2.96**	-.081 (.035)	-2.29*	-.081 (.036)	-2.27*	
Juvenile Court Referral Onset	-.049 (.039)	-1.27	-.052 (.039)	-1.32	.037 (.044)	0.85	.032 (.044)	0.73	
Gender			.083 (.111)	0.74				-.125 (.120)	
White			-.055 (.153)	-0.36				-.101 (.162)	
Black			.048 (.129)	0.38				-.017 (.140)	
Age			.005 (.011)	0.43				.008 (.561)	
N	216		216		216		216		
LRχ ²	27.96***		29.2***		12.25**		13.26*		
							240		
							17.51**		

*** $p < .001$, ** $p < .01$, * $p < .05$.

Table 5
Difference of means t-tests for criminal onset for ADHD and conduct disorder

Variable	No ADHD	ADHD	t-value	No Conduct Disorder (Yes)	Conduct Disorder	t-value
Antisocial Behavior Onset	12.8	11.7	2.76**	12.4	11.6	1.61
Police Contact/Arrest Onset	13.5	12.2	3.42**	12.9	12	2.12*
Juvenile Court Referral Onset	14.4	13.6	2.65**	14.1	13.6	1.45

** p<.01, * p<.05.

the voluminous early onset literature, but we caution against viewing this finding as pedestrian. The broader significance of early onset delinquency is never trite. These behaviors and the resultant police and judicial consequences set into motion a serious antisocial career that simultaneously detracts from the youth's prosocial development and facilitates the youth's antisocial development (Eme, 2009; Huesmann et al., 2009; Vaughn et al., 2008). Indeed, that the youths in the current sample are institutionalized attests to the pernicious effects of their early starting delinquent careers.

Second, arrest onset was the most consistent factor in the antisocial outcomes and was the only significant effect for both total arrest models and both self-reported delinquency models. It is noteworthy that arrest onset was significantly associated with both official (arrest) and self-report indicators of the delinquent career. Prior research (see Moffitt et al., 2008) intimates that the "truest" form of criminal onset, the earliest emergence of rule violations, is the strongest predictor of subsequent antisociality. We anticipated that its effect would most consistently be related to antisocial outcomes; however, it was only significantly related to the YPI total score models. In none of the models did juvenile court referral onset emerge as significantly associated with total arrests, self-reported delinquency, or psychopathic personality features. On average juvenile court referral onset occurs two years after behavioral onset and more than one year after arrest onset,

thus its effects might be too delayed to reveal a significant early-onset relationship at least when included in models with the other onset specifications.

Third, youths with ADHD displayed antisocial onset that was usually one year earlier than their peers without ADHD. And youths with CD had the earliest onset across all three measures. These findings were similarly expected based on the literature. However, it is important to note that ADHD and CD youth had earlier onset among a sample of fairly antisocial youth overall who average more than 15 acts of delinquency in the prior year and averaged nearly four arrests.

There are limitations to the current study that should be considered. First, these are cross-sectional data that provided a postdictive linkage between onset and the antisocial outcomes. A longitudinal design would allow investigators to empirically test a model on how various forms of criminal onset predicted subsequent behavior problems, and even how various forms of onset predicted later forms. For example, multiple data collection points would shed light on how behavioral onset sets into motion a certain "tolerance" for problem behaviors by parents, teachers, and official authorities. A youth with an early onset of problem behaviors might exhaust opportunities for leniency from adults, and thus be contacted by police earlier than a youth who has not displayed conduct problems. For instance, de Boer et al. (2012) recently found that repeating a grade in primary school, impulsivity, and physical abuse victimization from parents were the strongest predictors of early onset disruptive behaviors. Future research should examine how family and school contexts moderate the connections between behavioral onset and its police and judicial analogs. Finally, despite these limitations, the current study benefitted from several strengths including an enriched juvenile justice sample, moderate sample size, inclusion of multiple correlates and indicators of delinquency careers, and perhaps most importantly, an initial empirical step to integrate the multifarious nature of criminal onset.

Appendix A. Zero-order correlation matrix

	Y ₁	Y ₂	Y ₃	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉
Y ₁ Arrests	1.0											
Y ₂ YPI	.21	1.0										
Y ₃ Delinquency	.38	.33	1.0									
X ₁ ADHD	.12	.06	.18	1.0								
X ₂ Conduct Disorder	.18	.24	.01	.26	1.0							
X ₃ ASB Onset	-.23	-.15	-.22	-.21	-.11	1.0						
X ₄ Arrest Onset	-.34	-.21	-.21	-.29	-.17	.57	1.0					
X ₅ Juvenile Court Onset	-.23	-.04	-.08	-.22	-.08	.51	.60	1.0				
X ₆ Gender	.09	.03	-.09	.22	.18	-.23	-.31	-.19	1.0			
X ₇ Age	.02	-.01	.08	.10	.08	-.03	.04	-.04	-.19	1.0		
X ₈ African American	.03	.12	.01	-.00	-.08	.02	.02	.05	.07	-.11	1.0	
X ₉ White	-.07	-.02	-.02	.01	.01	.03	.04	.03	-.04	.15	-.55	1.0

Abbreviations: ASB = Antisocial Behavior, YPI = Youth Psychopathic Inventory.

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