Early Adult Outcomes of Male Arrest Trajectories: Propensity versus Causation Effects

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Abstract

This study examined early adult outcomes of differing arrest trajectories across childhood through early adulthood that were identified in prior work for 197 at-risk young men. Early adult outcomes were assessed at ages 27-28 to 29-30 years. Predictive effects of arrest trajectory membership on outcomes were examined after controlling for various factors, including prior levels and early antisocial propensity. As early adults, both chronic offender groups showed poorer adjustment in terms of deviant peer affiliation, education, and work domains than did the Rare Offenders; High-Level Chronic Offenders stood out from all other groups in terms of mental health problems and physical aggression toward a partner. These effects represent plausible causal effects of developmental pathways of offending on the outcomes. Evidence for propensity effects on the outcomes was more limited. Theoretical and prevention implications are discussed.

Keywords

early adult outcomes; life span; offending; trajectories

Criminologists have long been interested in the characterization of developmental patterns of antisocial behavior and crime across the life course. Recent advances in statistical methods (e.g., Muthén and Shedden 1999; Nagin 1999) have been highly instrumental in rejuvenating interest in this topic and have resulted in several long-term studies demonstrating considerable heterogeneity in offender pathways across the adolescent and early adult years (for an overview, see Piquero 2008). Interestingly, the existing hypothesized dual taxonomies of antisocial and criminal behavior across the life course (e.g., Moffitt 1993, 1997; Patterson and Yoerger 1993, 1997) have received only moderate support. Key differences in recent findings include the lack of a clear adolescent-limited trajectory, a much more pronounced adolescent peak for the most severe offender trajectory than posited, and the lack of predictive value of age of onset in distinguishing between the higher and more moderate offender pathways (Wiesner, Capaldi, and Kim 2007). Furthermore, studies often found more than two trajectories when using self-reports of offending (Piquero 2008).

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By comparison, the linkage between differing offender pathways and subsequent outcomes has received limited attention in empirical work. There is preliminary evidence that different offender pathways show differences in levels of problematic outcomes in a broad range of early adult-life domains, but these effects are difficult to interpret if they are not controlled for prior levels of the respective outcomes and propensity factors. Without controls for either early antisocial behavior or underlying propensities, it is difficult to rule out the counter argument derived from propensity theory (e.g., Gottfredson and Hirschi 1990) that differential early adult outcomes of distinctive offender pathways merely reflect stable individual differences in antisocial behavior or an underlying, shared propensity factor, such as poor self-control. This is a highly relevant theoretical issue because it speaks to the on-going debate of whether population heterogeneity, state dependence, or a mixture of both processes offer the best explanation of such findings. The purpose of this prospective study was to address this issue using official records data on arrest trajectories from an at-risk sample of young men. The study extends prior research that had identified three arrest trajectory groups for this sample: High-Level Chronic, Low-Level Chronic, and Rare Offenders (Wiesner et al. 2007).

Background

In prior research, we have hypothesized that high levels of chronic involvement in antisocial behavior are related to cumulative developmental failures (Capaldi 1991, 1992; Patterson and Capaldi 1991). Specifically, antisocial behavior and developmental failures lead to restriction of environmental options (e.g., rejection by socially skilled peers, academic failure, and high school dropout), which subsequently limit future social interaction, education, and employment opportunities (Capaldi and Stoolmiller 1999). Thus, these failures can act as "snares" (Moffitt et al. 1996) that diminish the chances for later success in more conventional arenas and entrap persistent offenders in a deviant life style. More severe offenders are also posited to carry overlearned coercive interaction styles[1] into new, age-graded social contexts (e.g., intimate relationships, work relationships) (Wiesner, Capaldi, and Patterson 2003) and to continue engagement in high-risk social contexts, such as selecting antisocial partners in young adulthood (Kim and Capaldi 2004) and engaging with criminal or deviant peers. Pathways of less severe offending, in contrast, are posited to be associated with less problematic outcomes than those of severe offenders but are still predicted to show poorer adjustment levels than those of none or rare offenders.

The dual taxonomies of offending that have predominated in the past decade (e.g., Moffitt 1993, 1997, 2006; Patterson and Yoerger 1993; Wiesner et al. 2003) posit considerably better outcomes for lower than for higher level offending trajectories. Thereby, early onset or life-course persistent offenders are hypothesized to follow the failure pathway; late starters or adolescence-limited offenders, on the other hand, are hypothesized to show less problematic outcomes because they have better adjustment skills (Patterson and Yoerger 1993), less severe developmental failures, and less time to accumulate negative consequences (Moffitt 1993). In general, however, these models appear to predict differences in levels of problematic outcomes, rather than distinctly different clusters of outcomes.

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[1]In the coercion model, criminal behavior and its childhood precursors (i.e., antisocial behavior) are conceptualized as complex outcomes of a history of reinforcing exchanges with the immediate social environment. This process starts within the family context but takes place in several stages and settings across the life course. The most important mechanism for learning antisocial behavior within the family context is hypothesized to be negative reinforcement, wherein a young child learns to use aversive responses (termed "coercive behaviors") to terminate the aversive behaviors of parents and siblings (Patterson 1982). According to the coercion model, these coercive interaction styles are to a large extent "overlearned" and consequently performed more or less automatically in differing settings in later stages of the life course (Patterson et al. 1992).

Relatively few long-term studies have provided empirical tests of such hypothesized differential effects. Three studies have tested a quite comprehensive set of outcome domains and largely provided support for the hypothesized rank ordering of offender pathways but did not control for prior levels of the given outcome (Moffitt et al. 2002; Nagin, Farrington, and Moffitt 1995; Piquero et al. 2007). For instance, Moffitt and colleagues (2002) found that men on the life-course persistent and adolescence-limited offender pathways had less education, more economic and employment difficulties, more alcohol- and drug-related problems, and higher levels of depression at age 26 years than did unclassified men. On many of these indicators, life-course persistent offenders showed significantly poorer profiles than did adolescence-limited offenders. In addition, life-course persistent offenders evidenced significantly more problems in the areas of abuse against female partners, fathering a large number of children, and hitting a child in anger at age 26 years than did most other groups. At least two other studies (Wiesner, Kim, and Capaldi 2005; Wiesner and Windle 2006) included controls for prior levels of the given outcome—thus providing a more stringent statistical test—but tended to focus on shorter developmental periods and/or fewer outcome domains. In general, these two studies found relatively few significant differences in examined outcomes among pathways characterized by high versus moderate levels of offending across time, though differences were more marked when high-level offenders were compared with rare or nonoffenders.

Summarizing, the available empirical literature offers some support for the contention that higher-level chronic offenders generally display poorer adjustment in early adulthood than do offenders in other trajectories, but the differences between them and lower-level chronic offenders appear to be negligible for some of the outcome domains. A limitation of this literature is that it is based on just a few studies and that relatively few of them controlled for prior levels of the given outcome measure, and almost none controlled for early antisocial propensity factors. Finally, most of the prior studies examined this issue using self-report data rather than official records measures of offending. The current study addressed these shortcomings in a number of ways, by focusing on a broad range of outcomes, examining outcomes for offender trajectory groups derived from official records data, following-up the participants over a longer developmental period than much extant research, and including systematic controls of early propensity for antisocial behaviors and other factors.

Study Aims and Hypotheses

This study examined predictive effects of different arrest trajectories on a broad range of early adult outcomes measured at ages 27-28 to 29-30 years for at-risk young men, controlling for childhood antisocial behavior, childhood and adolescent proxy of the outcome, parents' criminality, and demographic factors. Consistent with the described developmental failure model (e.g., Capaldi 1991, 1992; Patterson and Capaldi 1991), we expected that high-level chronic offenders would show poorer outcomes than those of any lower-level offender groups in the following domains: education and work, mental health problems, drinking and drug use, antisocial partnering, deviant peer affiliation, and aggression toward a partner. In addition, lower-level offenders were expected to show poorer outcomes in these domains compared with rare offenders. Parents' criminality was included to control for effects of crime displayed in the immediate environment of the men during their childhood years and possible genetic influences. Childhood antisocial behavior was included to help disentangle the effects of a shared stable propensity factor from plausible causal effects of the arrest trajectories on the outcomes.

Method

Sample

The analyses were conducted using data from the Oregon Youth Study (OYS), which is an ongoing multiagent and multimethod longitudinal study. A sample of boys was selected from schools in the higher-crime areas of a medium-sized metropolitan region in the Pacific Northwest. Thus, the boys were considered to be at heightened risk for later delinquency when compared with others in the same region. Of the eligible families, 206 agreed to participate (a 74.4 percent participation rate). The OYS consists of two successive Grade 4 (ages 9-10 years) cohorts of 102 and 104 boys, recruited in 1983-1984 and 1984-1985 (for details see Capaldi and Patterson 1987). The average retention rate was 98 percent through the early 20s, and 94 percent of living participants still remained as part of the panel in Year 20. Participants who moved out of the area were retained in the study, with interviewers traveling to assess them. Capaldi and Patterson (1987) conducted extensive comparisons of the two cohorts and found that they had very similar demographic characteristics. Consistent with prior studies, data from the two cohorts were thus combined for the current analyses. The sample was 90 percent Caucasian and 75 percent lower or working class; over 20 percent received some form of unemployment or welfare assistance in the first year of the study, which was a recession year for the local economy (Patterson, Reid, and Dishion 1992). Three young men who died during the study period and six other men who did not participate in the last three waves of data collection during which the outcome domains were assessed were excluded from the analyses; hence, the final sample size was 197. Parametric and nonparametric comparisons were performed to assess potential bias on study variables among men with complete data and those excluded from regression analysis because of missing values. No significant differences among the two groups were found for any of the variables used in the regression models, including the arrest trajectory grouping variable (all $p > .05$).

Procedures

Assessment on the OYS was yearly, multimethod, and multiagent, including in-person interviews and questionnaires for self and parents at the Center (each lasting approximately 1 hour), telephone interviews that provided multiple samples of recent behaviors (a total of six, 3 days apart), home observations (a total of three 45-minute observations), videotaped interaction tasks, school data (including teacher questionnaires and school achievement test scores), and court records. Family consent was mandatory. Participants were compensated for their time at each assessment wave.

Measures

Arrest trajectories—This study compared groups with different trajectories of offending (as indexed by number of arrests derived from juvenile and adult court records) that were already identified and described in an earlier report. Using semiparametric group-based modeling (Nagin 1999, 2005), Wiesner et al. (2007) identified heterogeneous subgroups with distinct developmental trajectories of arrests from ages 10-11 through 26-27 years (i.e., Waves 2 to 18), controlling for exposure time. A detailed account of the method, analysis strategy, model selection criteria, and model fit statistics is provided in their study. Briefly summarizing, Wiesner et al. (2007) identified three trajectory groups, including 141 (68.5 percent) *Rare Offenders* who almost never were arrested during the entire study period; 43 (22.3 percent) *Low-Level Chronic Offenders* who had a consistently low rate of arrests across the study period, with a slight peak around the middle adolescent years; and 19 (9.2 percent) *High-Level Chronic Offenders* who started with a similarly low arrest rate but then continuously increased toward a peak in the middle adolescent years, which was followed by a decrease to about the same level as the Low-Level Chronic group when they reached

their early 20s and another slight upsurge around their mid 20s. The three trajectory groups are shown in Figure 1. The classification quality was very high, with average posterior group membership probabilities ranging from .926 to .979 for the three classes and median posterior group membership probabilities ranging from .988 to .998. Borderline individuals who had similar or equal probabilities across classes were extremely rare. Assignment uncertainty, thus, was not considered a major problem for additional analyses with this sample. A final important finding was that both chronic offender groups had a significantly higher share of men with arrests for violent crimes than did the rare offender group.

Computation of Early Adult and Control Measures

The general strategy for building composite variables in the OYS has been described by Capaldi and Patterson (1989) and Patterson et al. (1992). Wherever possible, the measures were computed using data from multiple informants and various methods. In short, a three-stage process was used: First, the internal consistency of the items associated with each scale was established in Cohort 1 (alpha of at least .6; item-total correlation of at least .2). Second, the convergent validity of the indicators for a construct was examined within a principal component factor analysis (the factor loading for the one-factor solution had to be at least .3). Third, the internal consistency of the item scales and the convergent validity of the construct indicators had to replicate in Cohort 2. This procedure ensured that reports from multiple informants and methods were substantively associated with each other. If a composite variable consisted of indicators with differing response formats, indicators were standardized before averaging them.

All *early adult outcome measures* were gathered when the young men were ages 27-28 to 29-30 years (i.e., Waves 19-21). Thus, the early adult measures were obtained after the assessment of the young men's officially recorded offending behavior was completed. The variables were coded so that a higher score represented a more problematic behavior or outcome. Details on the early adult outcome measures, including internal consistency estimates, can be found in Table 1. Unless noted otherwise, answers were averaged across the three waves to increase the reliability of the measures.

Parents' criminality—This measure was created from State of Oregon arrest records and indicated the number of arrests ever experienced in state by both parents by Wave 1.

Proxy measures for early adult outcomes—For each early adult outcome, we controlled for a proxy measure of the same behavior in childhood assessed at age 9-10 years (i.e., Wave 1) and assessed in adolescence at ages 13-14 years, 15-16 years, and 17-18 years (i.e., Waves 5, 7, 9). The proxy measures were coded so that a higher score represented a more problematic behavior or situation (e.g., a higher score indicated a higher level of childhood antisocial behavior), with the exception of childhood and adolescent academic achievement where higher scores indicated better academic achievement. *Childhood antisocial behavior* served as proxy measure for antisocial partnering, psychological aggression toward a partner, and physical aggression toward a partner in early adulthood as it has been found in multiple studies to be the strongest childhood risk factor for intimate partner violence (Capaldi, Shortt and Kim 2005). It was measured with items from teacher-reports (19 items, $\alpha = .94$) and parent-reports (15 items each, $\alpha = .82$ each) of the Childhood Behavior Checklist (Achenbach 1991). Similar to earlier research with data from the OYS (e.g., Capaldi and Stoolmiller 1999), the construct was created using items from the delinquent and aggressive behavior subscales but excluding items from those scales that either overlapped with other constructs or were ambiguous (e.g., those pertaining to alcohol and drug use, and mood changes). The composite variable of childhood antisocial behavior contained both overt and covert antisocial behaviors, including arguing a lot, being

disobedient at school, getting into many fights, lying, and also cruelty, bullying, and meanness to others. *Childhood academic achievement* was used as a proxy measure for low educational attainment and months unemployed. It was a composite of the total score on the Wide Range Achievement Test (Jastak and Jastak 1978), parent and teacher ratings of the boys' performance in reading, spelling, writing, and math on the Child Behavior Checklist (Achenbach 1991), and the test scores on the standardized Scholastic Aptitude Test (from official school records). A *childhood mental health problems* score was formed by computing the mean across teacher and parent ratings (total *T*-scores) on the Child Behavior Checklist (Achenbach 1991). This composite score served as proxy measure for mental health problems. The *childhood deviant peers* score was developed by computing the mean across peer nominations, parent ratings, and child reports on belonging to a tough group, peer drinking, and peer deviant behaviors. This composite score served as proxy measure for deviant peer affiliation in early adulthood. For the early adult quantity-frequency index of alcohol use, *childhood alcohol use* (i.e., self-reported frequency of consumption in the past year) was used as proxy measure. *Childhood drug use* was measured by the self-reported frequency of drug use (i.e., hard drugs and marijuana) in the last year and was used as proxy measure for early adult drug use.

The adolescent proxies of the given early adult outcome domain were created in an analogous manner to the childhood proxy measures and are, consequently, not described again. However, one adolescent proxy variable, which was not available at the Wave 1 assessment period, was added for the prediction of both psychological and physical aggression toward a partner. The new proxy, *adolescent hostility toward women*, was assessed with 23 items of a self-report scale from Check and Malamuth (1983).

Results

Mean Levels of Descriptor Variables by Trajectory Group Membership

Shown in Table 2 are descriptive statistics (means and standard deviations unless otherwise noted), along with the results of univariate analyses of variance (chi-square tests for categorical variables, respectively) for each variable. Overall, most variables were significantly associated with trajectory group membership. Although the mean levels generally indicated more problematic backgrounds and outcomes for the High-Level Chronic group, there were a number of instances where the mean levels for the Low- and High-Level Chronic groups were very similar or possibly even more problematic for the Low-Level Chronic group. The Low-Level Chronic group showed the lowest level of childhood academic achievement and the highest levels of childhood substance use. Note that although the difference was not significant, the Low-Level Chronic group showed the highest level of parental criminality. It is possible that they came from relatively risky childhood backgrounds that included higher parent substance use. Four variables did not differ significantly by arrest trajectory group; namely, boy's age, parents' criminality, early adult alcohol use, and early adult drug use.

Prediction to Early Adult Outcomes

Next, prediction from arrest trajectories to early adult outcomes was examined in multiple regression analyses (for the binary outcome low educational attainment, logistic regression was used; for all other outcomes, linear regression models were used).[2] In order to test the a priori hypotheses, a contrast-coding (Cohen et al. 2003) scheme[3] was applied. *Contrast 1* compared the two chronic offender groups with the Rare Offender group. *Contrast 2* compared the High-Level Chronic offender group with the Low-Level Chronic offender group. Predictive effects of the two contrast variables were controlled for age, parental socioeconomic status (SES), parental criminality, childhood antisocial behavior, and a

childhood and an adolescent proxy measure of the given outcome (unless childhood antisocial behavior was sufficient as an early proxy measure). An inspection of bivariate associations among the early adult outcome measures revealed a small to moderate degree of overlap among them (not shown). The largest absolute correlations were between psychological and physical aggression toward a partner ($r = 0.65$, $p < .001$) and between deviant peer affiliation and antisocial partnering ($r = 0.58$, $p < .001$). The majority of correlations ranged from .10 to .30 in absolute value, and they were generally in the expected direction.

Because group sizes were quite small for some arrest trajectories, the significance level was not adjusted for the number of regression models but set to $p = .05$ when evaluating the significance of predictive effects on each outcome in order to compensate for the relatively low statistical power.[4] Findings for the conceptually most important predictors in regression models are shown in Table 3. Univariate effects for each variable are shown for comparison purposes.

Overall, there were relatively few significant predictive effects, especially for the measures of early adult substance use (i.e., alcohol consumption and drug use—although not shown— the same pattern of findings was also observed for a measure of binge drinking). Even after controlling for other risk factors, childhood antisocial behavior was consistently and positively related to low educational attainment, higher levels of antisocial partnering, and higher levels of psychological and physical aggression toward a partner in early adulthood. Relatively few childhood and adolescent proxy measures had significant predictive effects when other variables were controlled for. Contrast 1 indicated a significant association of chronic offending with low educational attainment, months unemployed, and deviant peer affiliation controlling for other predictors. As expected, members of both chronic offender groups showed poorer adjustment in these domains relative to Rare Offenders. Contrast 2 indicated that only two of the outcomes, namely mental health problems and physical aggression toward a partner, were distinguished between the two chronic offending groups, controlling for effects of other variables; High-Level Chronic offenders showed higher levels on both measures relative to Low-Level Chronic offenders.

Discussion

An at-risk U.S. community sample of 203 young men was used to examine associations between three distinct trajectory groups of offending and a set of multidomain early adult outcomes. These trajectories of High-Level Chronic, Low-Level Chronic, and Rare Offenders were identified based on arrest histories in a prior study (Wiesner et al. 2007). Whereas two major groups of offenders were identified in the prior study, one more severe

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[2]In its current version, SAS Proc Traj does not accommodate prediction from trajectory groups to outcome measures while controlling for the effects of various other variables on the given outcome. Thus, participants were assigned to arrest trajectory groups on the basis of maximum posterior probability rule, and regression models were estimated using the statistical software program SPSS 16.0. As described above, this analytical approach was appropriate because of the high classification quality of the three arrest trajectory class model solution. As a precaution, we nevertheless repeated all regression models using the randomized class assignment procedure developed by Bandeen-Roche, which accounts for class membership uncertainty (for details, see Bandeen-Roche et al. 1997, 1999). In general, the results of the regression analyses were similar for both methods of class assignment, with the exception of the predictive effects of Contrast 2, which were substantially diminished with randomized class assignment. This demonstrates that the predictive effects for Contrast 1 were robust and unaffected by the chosen class assignment method; whereas the effects found for Contrast 2 were less robust.

[3]Assigned values for Contrast 1 were: High-Level Chronic = .5, Low-Level Chronic = .5, Rare Offenders = -1. Values for Contrast 2 were: High-Level Chronic = 1, Low-Level Chronic=-1, Rare Offenders = 0.

[4]The sample size for the three outcomes antisocial partnering, psychological aggression toward a partner, and physical aggression toward a partner was reduced to $n = 181$ because not all of the OYS men had a steady intimate partner during this assessment period. This subgroup did not differ significantly on any of the predictors used in the three regression models from the men with missing data according to parametric and nonparametric tests (all $p > .05$).

than the other, they did not fit with predictions from the dual taxonomy models of Patterson and Moffitt in a number of respects. In particular, they did not show differential ages at first arrest, there was no clear adolescent-limited trajectory, and both groups continued offending after adolescence but both showed a substantial downward trend in offending in later adolescence, particularly the Chronic High-Level offenders. Despite these differences, hypotheses related to outcomes (controlling for prior levels and early antisocial behavior), based in part on the dual taxonomy models, were tested for the High-Level Chronic and Low-Level Chronic offender groups.

Overall, the multivariate analyses indicated that both chronic offender groups showed poorer functioning in the deviant peer affiliation, education, and work domains by the late 20s than Rare Offenders, and High-Level Chronic offenders had more problems related to both mental health and physical aggression toward a partner as early adults than did Low-Level Chronic offenders, controlling for effects of other variables. Differential early adult outcomes of the arrest trajectory groups were not observed for antisocial partnering, psychological aggression toward a partner, alcohol use, and drug use.

Both the High- and Low-Level Chronic offender groups showed poorer adjustment in their late 20s in multiple domains than the Rare Offender group. There was evidence, however, of considerable overlap among the two chronic offender groups in the sense that they were indistinguishable on several outcome domains. As predicted by dual taxonomies (e.g., Moffitt 1993; Patterson and Yoerger 1993), High-Level Chronic offenders had higher levels of mental health problems and physical aggression toward a partner than did Low-Level Chronic offenders. This should be viewed as a tentative result, however, because the strength of these effects was somewhat dependent on the chosen class assignment method (i.e., as described in Footnote 2, the predictive effects of Contrast 2 were smaller in magnitude when randomized class assignment was used). Because these prospective effects were controlled for childhood and adolescent levels of the outcomes (where developmentally appropriate), parental criminality (a proxy for possible genetic influences), and early antisocial behavior, we can conclude that they do not merely reflect spurious associations caused by an underlying, shared risk factor (as claimed by propensity theories of crime) but to some extent are variations arguably caused by the cumulative failures or problems associated with sustained offending over time (as posited by developmental theories of crime).[5] This interpretation is bolstered by the additional finding (not reported) that the sum of all official arrests experienced by an OYS man across the same time period (i.e., Waves 2-18) was a considerably less salient predictor of the same set of outcomes compared with arrest trajectory membership, controlling for the same factors as in the analyses shown above. This important finding suggests that variation in developmental pathways of offending is more meaningful and provides more complex insights into the patterns of differential outcomes than variation in total levels of offending.

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[5]One anonymous reviewer posed the question whether the deleterious outcomes (e.g., low educational attainment, unemployment periods) could have occurred as a result of incarceration and other forms of custody rather than trajectory group membership. Note that time spent in jail, prison, or juvenile detention and correction facilities (hereafter summarily referred to as "custody") was statistically accounted for in the trajectory modeling analyses via the exposure- time parameter. Furthermore, unemployment periods resulting from disability, being a student, or incarceration were excluded during the calculation of the "months unemployed" outcome measure (see Table 1). Descriptive information shows the following distribution of custody times over the 17-year period (equaling a total of 884 weeks) from ages 10/11 to 26-27 years: Out of 19 *high-level chronic offenders*, three were 0 weeks in custody, 3 spent 1-26 weeks in custody, 3 spent 27-52 weeks in custody, 3 spent 53-104 weeks in custody, 4 spent 105-208 weeks in custody, and the final 3 spent more than 208 weeks in custody. Out of 42 *low-level chronic offenders*, 13 were 0 weeks in custody, 20 spent 1-26 weeks in custody, 3 spent 27-52 weeks in custody, 4 spent 53-104 weeks in custody, and the final 2 spent 105-208 weeks in custody. On the basis of these distributions and also the timing of most of the custody periods (note that in most cases they were not spent consecutively in one single block but occurred here and there over the 17-year period) in the men's life course, it is not very likely that the deleterious effects on the outcomes were primarily the result of custody placements.

These conclusions are obviously dependent on the adequacy of the measure of early antisocial behavior. The measurement of the propensity for crime has been a contentious issue in the literature. According to propensity theory (see Hirschi and Gottfredson 1993), propensity for crime "is significantly comprised by early behavioral indicators of aggression and fighting" (Polakowski 1994:41) and is best measured in childhood. Our measure of antisocial behavior was assessed at ages 9-10 years and contained various indications of overt and covert antisocial behaviors, as observed by the boys' parents and teachers (not the boys themselves). Although this focus on behavioral components of propensity for crime fits well with propensity theory (see also Tittle, Ward, and Grasmick 2003), we note that data on additional features of the construct, such as impulsivity, specific domains of executive functioning , and various dimensions of temperament, were not employed. Inclusion of nonbehavioral components of the propensity for antisocial behavior in further research on this topic would be helpful insofar as it would provide an even stronger basis for ruling out concerns that the predictive effects were spurious (i.e., the result of a shared underlying risk factor).

In prior research with the OYS sample, we also found prospective associations of self-reported offender pathways to some early adult outcomes (see Wiesner et al. 2005), controlling for prior levels and early antisocial behavior. This demonstrates some convergence of findings across different assessment methods of delinquent behavior. We are not aware of other research that has employed this relatively conservative hypothesis testing strategy using both self-report and official records measures of offending. Cross validation of these findings with independent samples would be helpful for the field.

The pattern of predictive effects to early adult outcomes suggests that the adverse effects of both Low- and High-Level Chronic offending do not necessarily permeate all domains of life at the end of the 20s. Notably, no adverse effects were observed for early adult drinking and drug use, which is inconsistent with our prior findings for self-report-based trajectories of offending with the same sample (Wiesner et al. 2005) as well as some other studies (e.g., Piquero et al. 2007). The source of these inconsistencies is not clear because the measures of alcohol and drug use were quite comparable to those in most of the other studies. A possibility is that a maturing out phenomenon had materialized in the assessment years after the prior study, because the significant negative predictive effect of the adolescent alcohol proxy measure indicated that those who consumed more alcohol in adolescence drank less in their late 20s. This might have reduced variability in the drinking outcome measures. It is also possible that men involved in the justice system were mandated to substance use treatment programs; also, clean drug use tests may be a condition of probation and parole. Sample characteristics may also play a role, but at least for the OYS sample, the association between offender trajectories and early adult substance use is not very robust because it depended on the measurement of offending behavior. It will be of interest to see whether this also holds when more long-term adjustment profiles are examined for the men.

The findings from this study further indicated considerable overlap among chronic offender groups, with Low-Level Chronic offenders (in addition to High-Level Chronic offenders) experiencing adverse consequences of their sustained offending behavior in subsequent periods of life, most notably in the education, work, and deviant peer affiliation domains. Other studies have arrived at similar conclusions but often without controlling for prior levels and other factors (e.g., Nagin et al. 1995). Given the scant literature basis and because more specific mechanisms were not directly tested in the current study, interpretation of processes that accounted for the observed adverse consequences must be done with caution. For the reasons described in Footnote 5, it appears unlikely that incarceration or other forms of custody were the primary agents for the adverse consequences in the education and work domains. Rejection by normative peers and self-selection effects are a possibility for

explaining the adverse effects in the deviant peer affiliation domain. Together, the findings from this and prior studies suggest that not only higher-level but also lower-level chronic offenders are important candidates for preventive intervention work in order to avoid longer-term detrimental outcomes of their engagement in antisocial and criminal behaviors.

It must be noted that the observed effects of arrest trajectories on the early adult outcomes were fairly small. Predictive power was somewhat limited, with the exception of antisocial partnering and deviant peer affiliation, thus indicating that the majority of early adult variation in the considered outcomes was accounted for by other influences. Although perhaps disappointing from the perspective of developmental theories of crime, this also implies a positive message. On the basis of the findings from this study, it can be concluded that differing chronic offender pathways do not fully predetermine levels of psychosocial functioning in the early adult years. Other life experiences or influences, such as romantic partner influences, chance effects, and individual self-regulation, may also play a role.

A final noteworthy finding concerns the predictive effects of arrest trajectories in the intimate partner domain. Consistent with two other studies (Moffitt et al. 2002; Nagin et al. 1995), our findings indicated some continuity of antisocial behavior in the intimate partner domain for chronic offenders in the form of domestic abusive behaviors. Going beyond prior research, our findings also documented that chronic offenders are at increased risk for having antisocial partners in adult years. After controlling for early antisocial behavior and adolescent hostility toward women, however, this effect became nonsignificant. This suggests that this association is largely the consequence of early developmental factors, particularly early antisocial behavior, and that chronic arrest patterns do not add further risk. This is in keeping with the view that risk for aggression toward a partner is related to impulsive, undercontrolled behavior and conduct problems that develop in childhood. Further developmental failure, as indexed at least by arrests, does not appear to add further risk.

Some caveats are warranted in interpreting the findings from this study. First, the study was conducted with data from a mostly Caucasian sample of at-risk, young men. The findings from this study may not generalize to samples from the general population, special populations such as incarcerated offenders, offenders from other ethnic groups or sociocultural contexts, and female offenders. It is imperative that the effects of sample diversity are studied more closely. Second, the sample size was relatively small, limiting statistical power. This applies in particular to the small group of high-level chronic offenders. Cross-validation of the current findings, especially for the high-level chronic offender trajectory group, with larger samples is consequently critical. Third, the outcome measures used in this study did not involve clinical diagnoses, and it remains to be seen if findings would be similar in such cases (especially for the substance use outcome domain). Fourth, identification of arrest trajectories was based on right-censored data, which is necessarily the case when studying ongoing behaviors. Other research has shown that length of follow up can affect identified trajectories of crime (Eggleston, Laub, and Sampson 2004). We cannot rule out the possibility that this has introduced some bias for comparisons involving men in the High-Level Chronic group, whose criminal behavior was still unfolding at the end of the observation period. These study limitations are offset by several strengths, including the long-time span from late childhood through the late 20s, with annual assessments of the men, usage of sound measures garnered from multiple informants/ methods, and the very little likelihood that the observed prospective associations with arrest trajectory groupings are exacerbated by shared measurement variance. From an applied perspective, the findings from this study suggest that it would be shortsighted to concentrate all prevention and intervention efforts just on the High-Level Chronic offenders, as Low-Level Chronic offenders also evidenced adverse outcomes of offending in several early adult

domains. This subgroup, which was overlooked in the original versions of dual developmental taxonomies of antisocial behavior (e.g., Moffitt 1993), deserves more attention in future prevention research.

Acknowledgments

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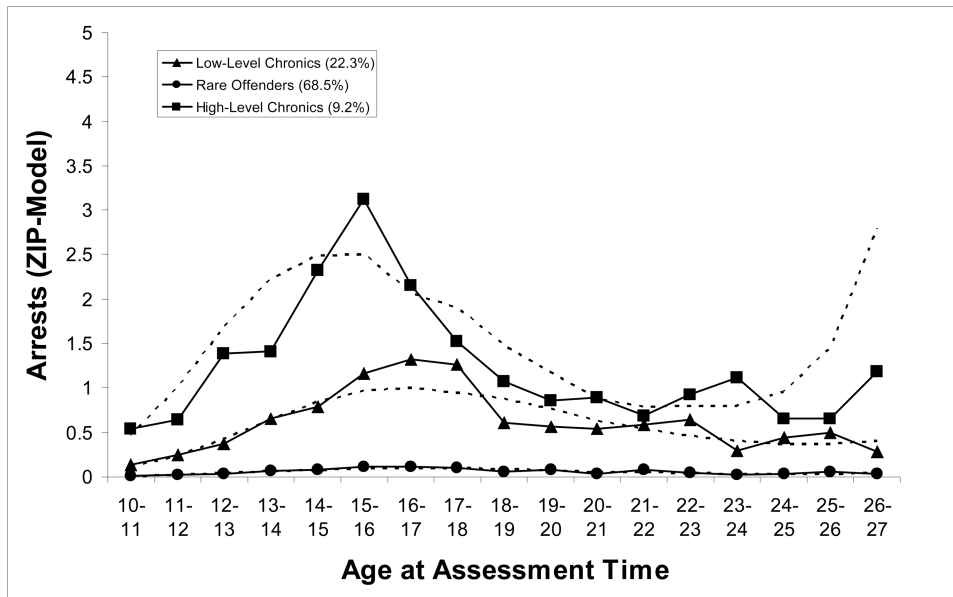
Figure 1. Fitted (Dashed Lines) versus Empirical (Solid Lines) Trajectories of Officially Recorded Offending for OYS Men
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Table 1

Description of Constructs and Scales.

Construct/ Measure	No. of Items	Cronbach Alpha[1]	Description or Sample Item
Low Educational Attainment (Yes, No)			No high school graduation/GED (1) versus regular high school degree and higher (0)
1. Young Man – Self-reported educational history for each month of the given year	1	---	Highest educational degree obtained by end of the 3-year period
2. School Records and State Records	1	---	One-time verification of high school graduations and GED diplomas
Months Unemployed			
1. Young Man – Self-reported employment history for each month of the given year	1	---	Total number of months unemployed summed up across the 3-year period (excluding unemployment periods resulting from disability, being a student, or incarceration)
Mental Health Problem			
1. Young Man – Brief Symptom Inventory (Derogatis and Spencer 1982)	53	.96, .97	Global Severity Index (Standardized *T*-Score), averaged across Waves 19 and 21
Quantity-Frequency-Index (QFI) of Alcohol Use			
1. Young Man – Structured Interview	6	---	Average number of ounces of ethanol consumed per day in given year (based on separate reports for beer, wine, and hard liquor usage)
Drug Use			
1. Young Man – Structured Interview	5	---	Annual frequency of drug use (based on separate reports for marijuana, cocaine or crack, hallucinogens, opiates, and other not over-the-counter drugs usage)
Antisocial Partnering			
1. Female Partner – Elliott Behavior Checklist (Elliott 1983)	13	.76 - .82	Self-reported delinquent behavior of the young man's most recent female partner during the 3-year period
2. Interviewer/Coder Ratings – Questionnaire	4	.65 - .84	Partner seemed antisocial or delinquent
Physical Aggression Toward a Partner			
1. Self-report			
Adjustment with Partner (Kessler 1990)	2	.62 - .83	When disagree, how often do you push, grab, shove, throw something at partner, slap, or hit?
Dyadic Social Skills Questionnaire	1		You sometimes hurt your partner (e.g., hit her or twist her arm)?
Conflict Tactics Scale (Straus 1979)	6		Threw something at your partner
2. Partner-report			
Adjustment with Partner (Kessler 1990)	2	.73 - .87	When disagree, how often does he push, grab, shove, throw something at you, slap, or hit?
Interview	1		How many times has your partner hurt you?
Dyadic Social Skills Questionnaire (Capaldi 1994)	1		Your partner sometimes hurts you (e.g., hit or twist your arm)?
Conflict Tactics Scale (Straus 1979)	6		Threw something at you
3. Coder report			
Coder impression rating	4	r=.14 - .33	Displayed push, grab, or shove during task
Coded physical aggression (Stubbs et al. 1998)	NA		Rate per minute of aversive physical content during task
Psychological Aggression Toward a Partner			

Construct/ Measure	No. of Items	Cronbach Alpha[1]	Description or Sample Item
1. Self-report			
Dyadic Social Skills Questionnaire (Capaldi 1994)	10	.63 - .83	Say mean things about your partner behind her back
Conflict Tactics Scale (Straus 1979)	6		Yelled and/or insulted partner
Interview	1		Name calling, threats, sulking, or refusing to talk, screaming or cursing, throwing/breaking something [not at partner]?
Adjustment with Partner (Kessler 1990)	1		When disagree, how often do you insult or swear, sulk or refuse to talk, stomp out of the room, threaten to hit?
2. Partner-report			
Adjustment with partner (Kessler 1990)	4	.61 - .87	When disagree, how often does he insult or swear, sulk or refuse to talk, stomp out of the room, threaten to hit?
Dyadic Social Skills Questionnaire (Capaldi 1994)	10		Your partner blames you when something goes wrong.
Partner Interaction Questionnaire (Capaldi 1994)	17		Broken or damaged something of yours on purpose?
Conflict Tactics Scale (Straus 1979)	6		Yelled and/or insulted you.
Interview	1		Name calling, threats, sulking, or refusing to talk, screaming or cursing, throwing/breaking something [not at you]?
3. Coder report			
Coder impression rating	11	r=.52 - .62	Was derogatory, sarcastic to partner in task, or called partner in task negative names.
Coded psychological aggression (FPPC: Stubbs et al. 1998)	NA		Rate per minute of negative interpersonal, verbal attack, and coercive behavior
Affiliation with Deviant Peers			
1. Young Man – Structured Interview	19	.91	During the last year, how many of your friends have stolen something worth less than $5.00
2. Young Man – Young Adult Self-Report (Achenbach 1993b)	1	---	I hang around with others who get in trouble
3. Parent Report – Young Adult Adjustment Questionnaire (Capaldi, King, and Wilson 1992)	5	.86 - .90	Do you feel that your son's friends have a good influence on his behavior
4. Parent Report – Young Adult Behavior Checklist (Achenbach 1993a)	1	---	[Your son] hangs around with people who get in trouble

[1]Reliabilities are reported for Waves 19, 20, and/or 21.

Table 2

Descriptive Statistics for all Study Variables.

Variable	Total	By Arrest Trajectory Group			
		Rare Offenders	Low-Level Chronics	High-Level Chronics	p-value
Age	10.09 (0.49)	10.06 (0.46)	10.17 (0.58)	10.13 (0.43)	ns
Parents' SES	32.54 (0.91)	34.44 (10.23)	28.14 (7.82)	28.21 (7.38)	.000
Parents' Criminality	0.90 (2.64)	0.66 (2.79)	1.65 (2.35)	1.00 (1.73)	ns
Child Antisocial Behavior	0.32 (0.27)	0.27 (0.22)	0.40 (0.34)	0.48 (0.33)	.007
Child Academic Achievement	0.02 (0.75)	0.10 (0.74)	-0.26 (0.72)	0.01 (0.70)	.020
Child Mental Health Proxy	54.06 (8.91)	51.49 (8.32)	59.80 (7.24)	60.07 (7.83)	.000
Child Alcohol Use Proxy	0.63 (0.74)	0.53 (0.61)	1.01 (1.03)	0.56 (0.53)	.003
Child Drug Use Proxy	0.11 (0.55)	0.02 (0.16)	0.41 (1.11)	0.05 (0.16)	.012
Child Deviant Peers Proxy	0.00 (0.65)	-0.13 (0.47)	0.25 (0.87)	0.33 (0.83)	.007
Adol. Antisocial Behavior	0.32 (0.25)	0.22 (0.17)	0.54 (0.23)	0.60 (0.32)	.000
Adol. Academic Achievement	-0.07 (0.77)	0.03 (0.76)	-0.32 (0.75)	-0.27 (0.79)	.013
Adol. Mental Health Proxy	50.93 (8.40)	48.32 (7.71)	56.36 (7.27)	57.04 (6.70)	.000
Adol. Alcohol Use Proxy	0.94 (0.77)	0.72 (0.63)	1.44 (0.80)	1.44 (0.85)	.000
Adol. Drug Use Proxy	0.49 (0.89)	0.27 (0.58)	0.90 (1.16)	1.20 (1.31)	.001
Adol. Deviant Peers Proxy	1.78 (0.51)	1.61 (0.39)	2.19 (0.56)	2.18 (0.43)	.000
Adol. Hostility Toward Women	0.24 (0.18)	0.21 (0.18)	0.31 (0.15)	0.33 (0.18)	.001
Low Educational Attainment [a]	47.2 (93)	34.6 (47)	73.8 (31)	78.9 (15)	.000
Months Unemployed [b]	1.19 (1.51)	0.93 (1.40)	1.86 (1.65)	1.57 (1.44)	.001
Mental Health Problems	50.21 (10.03)	49.16 (9.52)	50.84 (11.45)	56.34 (8.27)	.012
Alcohol Use (QFI) [c]	0.77 (0.22)	0.77 (0.21)	0.74 (0.25)	0.81 (0.26)	ns
Drug Use	0.67 (0.66)	0.65 (0.64)	0.66 (0.64)	0.85 (0.84)	ns
Deviant Peer Affiliation	0.00 (0.80)	-0.21 (0.66)	0.39 (0.86)	0.69 (0.95)	.000
Antisocial Partnering	-0.06 (0.25)	-0.11 (0.24)	0.03 (0.22)	0.13 (0.27)	.000
Psychological Aggr. toward Partner [d]	1.91 (0.51)	1.85 (0.51)	1.97 (0.48)	2.18 (0.50)	.028
Physical Aggr. toward Partner [b]	0.18 (0.21)	0.16 (0.21)	0.18 (0.20)	0.30 (0.25)	.034

Note. Each column shows means, and standard deviations are given in parentheses. QFI =Quantity-Frequency-Index

[a]Column shows percentages and number of men in parentheses for this variable.

[b]In square root transformed metric.

[c]In inverse transformed metric.

[d]In base 10 logarithm transformed metric.

Table 3

Univariate and Multivariate Regression Predictions to Low Educational Attainment, Months Unemployed, Mental Health Problems, Alcohol Use, Drug Use, Deviant Peer Affiliation, Antisocial Partnering, Psychological Aggression Toward a Partner, and Physical Aggression Toward a Partner at Ages 27/28 to 29/30 Years (Waves 19-21).

Predictor	Low Educational Attainment (n=197)					Months Unemployed (n=197)				Mental Health Problems (n=197)			
	Univar. B	B	SE	Exp(B)	β	Univar. b	b	SE	β	Univar. b	b	SE	β
Childhood Antisocial Behav.	3.23***	2.22	0.77	9.19**		1.16**	0.52	0.46	0.09	7.01**	-0.92	4.68	-0.03
Childhood Proxy	-0.60***	-0.09	0.25	0.92		-0.28*	-0.04	0.16	-0.02	0.27***	0.18	0.17	0.16
Adolescent Proxy	-0.70***	-0.47	0.25	0.63†		-0.22	-0.08	0.16	-0.04	0.30***	0.17	0.12	0.15
Contrast 1	1.21***	0.69	0.29	1.99*		0.53***	0.40	0.19	0.19*	2.95**	1.82	1.25	0.13
Contrast 2	0.14	0.19	0.35	1.21		-0.14	-0.14	0.20	-0.05	2.75*	2.65	1.34	0.14*
Model Fit	---	$R^2 = .10^*$		Model $\chi^2_{(df=8)} = 51.10^{***}$		---		$R^2 = .09^*$		---		$R^2 = .11^{**}$	

Predictor	QFI Alcohol Consumption (n=197)				Drug Use (n=197)				Deviant Peer Affiliation (n=197)			
	Univar. b	b	SE	β	Univar. b	b	SE	β	Univar. b	b	SE	β
Childhood Antisocial Behav.	0.04	0.05	0.07	0.05	0.28	0.33	0.19	0.13†	0.30***	0.34	0.22	0.11
Childhood Proxy	0.01	0.03	0.02	0.10	-0.05	-0.10	0.09	-0.08	0.07	-0.13	0.09	-0.11
Adolescent Proxy	-0.05*	-0.06	0.02	-0.22**	0.21***	0.23	0.06	0.31***	0.56***	0.33	0.12	0.21**
Contrast 1	0.00	-0.01	0.03	-0.02	0.07	-0.07	0.09	-0.07	0.44***	0.40	0.10	0.36***
Contrast 2	0.03	0.04	0.03	0.09	0.10	0.05	0.09	0.04	0.10	0.15	0.10	0.11
Model Fit	---		$R^2 = .10^*$		---		$R^2 = .12^{**}$		---		$R^2 = .25^{***}$	

Predictor	Antisocial Partnering (n=181)				Psychological Aggression Toward a Partner (n=181)				Physical Aggression Toward a Partner (n=181)			
	Univar. b	b	SE	β	Univar. b	b	SE	β	Univar. b	b	SE	β
Childhood Antisocial Behav.	0.38***	0.16	0.08	0.18*	0.42**	0.37	0.16	0.20*	0.16**	0.15	0.07	0.19*
Adolescent Proxy	0.45***	0.31	0.10	0.32**	0.27	0.11	0.22	0.04	0.01	-0.05	0.10	-0.04
Contrast 1	0.13***	0.01	0.03	0.03	0.15**	0.05	0.07	0.07	0.05*	0.02	0.03	0.06
Contrast 2	0.05	0.04	0.03	0.08	0.11	0.11	0.07	0.12	0.06*	0.06	0.03	0.16*

Predictor	Univar. B	B	SE	Exp(B)	Univar. b	b	SE	β	Univar. b	b	SE	β
Model Fit	---	$R^2 = .25$***			---	$R^2 = .08$*			---	$R^2 = -.07$†		

Note. All parameter estimates shown are additionally controlled for boy's age, parents' SES, and parents' criminality. Arrest trajectory group assignment based on maximum posterior probability class assignment rule. Employing a contrast-coding scheme: *Contrast 1* (High-Level Chronic + Low-Level Chronic Offenders versus Rare Offenders), and *Contrast 2* (High-Level Chronic Offenders versus Low-Level Chronic Offenders). The months unemployed score and the physical aggression toward a partner score were positively skewed, and the square root transformation was used. The Quantity Frequency Index (QFI) score was positively skewed, and the inverse transformation was used. The antisocial partnering score was positively skewed, and the base 10 logarithmic transformation was used. *Univar* = Univariate unstandardized regression weight.

***
$p < .001$;

**
$p < .01$;

*
$p < .05$;

†
$p < .10$