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History of Juvenile Arrests and Vocational Career Outcomes for At-Risk Young Men

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Abstract

This study used longitudinal data from the Oregon Youth Study (OYS) to examine prospective effects of juvenile arrests, and of early versus late onset of juvenile offending, on two labor market outcomes by age 29/30 years. It was expected that those with more juvenile arrests and those with an early onset of offending would show poorer outcomes on both measures, controlling for propensity factors. Data were available for 203 men from the OYS, including officially recorded arrests and self-reported information on the men's work history across 9 years. Analyses revealed unexpected specificity in prospective effects: Juvenile arrests and mental health problems predicted the number of months unemployed; in contrast, being fired from work was predicted by poor child inhibitory control and adolescent substance use. Onset age of offending did not significantly predict either outcome. Implications of the findings for applied purposes and for developmental taxonomies of crime are discussed.

Keywords

Arrests; Work; Young Adulthood

Entering the labor force and establishing a stable work history is a central task in young adulthood and critical to individual and family well-being. Failure in this transition often has long-term negative economic and psychosocial consequences (Ezzy 1993; Furnham 1994). Despite the importance of this issue, few researchers have examined the precursors of young-adult employment patterns from a developmental perspective. Existing models of life-span career development (e.g., Vondracek, Lerner, and Schulenberg 1986) generally emphasize the need to consider both person and context factors. In criminology, interest in the effects of crime

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on subsequent early adult work outcomes has increased only recently (Bushway 1998). Influential contemporary theories posit that those with an early onset of delinquent behavior tend to show a more chronic and persistent pattern of crime and have more detrimental adult outcomes than those who onset in mid to late adolescence (e.g., Moffitt 1993; Patterson and Yoerger 1993), with the latter group showing offending limited to adolescence with few adverse long-term consequences (Moffitt 1993). However, little empirical work has examined whether early onset of criminal behavior is indeed a salient predictor of various young-adult work outcomes. The purpose of this longitudinal study was to examine the association of both juvenile arrests and age of onset of offending with two employment outcomes for the Oregon Youth Study (OYS).

Theoretical Perspectives and Empirical Findings

Many contemporary discussions of how criminal behavior may lead to subsequent success and failure in work careers have their roots in developmental theories that attempt to explain the dynamic process by which past offending may lead to future offending (Bushway 1998). Thereby, employment problems in the young-adult years are often regarded as a key factor linking juvenile delinquency to criminal behavior in adulthood. Two processes, in particular, have been proposed by criminologists to explain such linkages, namely failure to build human and social capital (Hagan 1993) and labeling effects (Becker 1963). These processes are likely interrelated and show some parallels to stratification research. The latter studies the association of individual background factors (e.g., race, disadvantaged family background) and life events (e.g., abuse/neglect, criminal justice contact) with adult positions in the social stratification system, and examines the direct and indirect barriers that account for the association between individual background factors and stratification outcomes (e.g., Duncan et al. 1992; Jencks and Mayer 1990; Wilson 1987). However, the focus of the current study is more at the individual than societal level, and therefore centers more conceptually on both failure to develop capital and labeling effects for explaining the association of juvenile crime and later employment outcomes.

The first hypothesized process is an extension of Granovetter's (1985, 1992) notion of the "social embeddedness" of economic actions and goals. With regard to young people entering the labor market for the first time, this notion implies that those with access to a network of business contacts increase their chances to secure a job with good prospects. Building on this work, Hagan (1993) has posited that the process of "social or criminal embeddedness" during the late childhood and adolescent years (i.e., continuing engagement in delinquent behavior, involvement of parents in crime, affiliation with delinquent peers) leaves delinquent youths without the necessary human and social capital (e.g., conventional local contacts or referral networks that could facilitate the transition into the labor market) to successfully participate in legal employment once they reach the adult years. This, in turn, heightens the risk for subsequent engagement in criminal activities. Formal sanctions of criminal behavior such as imprisonment are posited to further contribute to this chain of effects because inmates become embedded even more firmly in criminal networks that lead away from opportunities for legal employment and reduce long-term prospects for stable employment and adequate earnings, along with other "collateral consequences" (Hagan and Dinovitzer 1999). However, Hagan (1993) cautioned that the association between delinquency and subsequent work outcomes will likely be spurious to some extent because prior risk factors may be predictive of both.

Others have particularly highlighted the labeling and stigmatizing effects of contact with the criminal justice system, including a history of arrests, convictions, and especially incarceration, on later employment outcomes (e.g., Becker 1963). Sampson and Laub (1997) integrated such notions into their age-graded theory of informal social control and posited that involvement with the criminal justice system as a consequence of engagement in crime is a key example of

what they call the “process of cumulative disadvantage”. They they stated that formal labeling arising from contact with the criminal justice system causes employers to exclude adult ex-offenders from conventional employment opportunities and in this sense “mortgage” their future. Such exclusion leads to job instability (e.g., Sampson and Laub 1993), which has been shown to increase subsequent adult offending (e.g., Sampson and Laub 1990).

There is evidence supporting both of these theorized processes. It is commonly found that arrests, convictions, and incarcerations in adolescence and early adulthood have adverse consequences for subsequent work outcomes, including income level, employment stability, unemployment, and career pathways (e.g., Bushway 1998; Freeman 1991; Grogger 1995; Hagan 1993; Kerley et al. 2004; Needels 1996; Sampson and Laub 1993; Tanner Davies and O'Grady 1999; Thornberry and Christenson 1984; Western 2002; Wiesner et al. 2003), though there may be differences as a function of race (e.g., Sullivan 1989).

More specifically targeting potential stigmatization effects, both experimental studies and survey research have shown that employers are reluctant to consider ex-offenders as potential employees (e.g., Boshier and Johnson 1974; Buikhuisen and Dijksterhuis 1971; Holzer 1996). Federal legislation denies employment to ex-felons from specific jobs (Bainbridge 1985) and state legislation in most states mandates screening on the basis of criminal history records for many jobs (see Burton, Cullen, and Travis 1987; Dale 1976). About 30-40% of employers actually check the criminal history records of their most recently hired employee (Holzer 1996), and this proportion may be rising. Such labeling and stigmatization effects may contribute to ex-offenders becoming entrapped in a deviant life style but are unlikely to fully account for the association between juvenile delinquency and young-adult employment outcomes.

Building on these theories and empirical findings, proponents of developmental taxonomies of crime have adopted some of these notions but argued that effects likely depend on the developmental pathway of offending. Youth with an early onset of offending are posited to be at increased risk for experiencing various secondary problems and developmental failures later in life, including academic failure, substance use, and work failure (Capaldi and Stoolmiller 1999; Patterson and Yoerger 1993). Each secondary problem may cause new detrimental consequences or developmental failures later on (Capaldi and Stoolmiller 1999), and thus cumulative disadvantage. By comparison, late-onset or adolescence-limited offenders (Moffitt 1993) have been hypothesized to engage in less severe offending (Patterson and Yoerger 1993) and to have less time to accumulate negative consequences. Within these frameworks, early onset offenders would be expected to show poorer employment outcomes in young adulthood compared to late onset offenders, as well as nonoffenders.

The association of age of onset of offending with employment outcomes has been little examined. There is some evidence for a British sample that adverse employment outcomes may be accentuated not only for offenders with an early first arrest, but also for chronic offenders (Nagin, Farrington, and Moffitt 1995). Others found that individuals with an earlier first arrest had significantly lower odds of employment stability relatively to those with a later first arrest, controlling for other factors (Kerley and Copes 2004). However, the cut-off age chosen in this study was in adulthood and thus in effect lumped together childhood-onset and adolescent-onset offenders. In addition, Kerley et al. (2004) found that the timing of contact with the criminal justice system significantly predicted income levels, especially among white participants.

Given the relative paucity of research on this topic, more stringent tests of prospective effects of early versus late onset of offending on employment outcomes are needed. Moreover, recent trajectory studies have revealed some problems with the developmental taxonomies. Most

importantly, the pattern of strictly adolescence-limited offending hypothesized by Moffitt (1993) has not emerged clearly from various longer-term trajectory studies of offending (e.g., Blokland, Nagin, and Nieuwbeerta 2005; Sampson and Laub 2003; Wiesner and Capaldi 2003). Rather, it appears that many youth with an adolescent onset persist in some degree of offending well into their 20s, which may be detrimental to their vocational careers. Therefore, it is possible that age of onset is a less salient predictor of young-adult work outcomes than expected on the basis of developmental taxonomies of crime (e.g., Moffitt 1993). This issue needs further clarification.

There are various other limitations in the existing literature on effects of crime on young-adult work outcomes. First, a large proportion of the empirical work in criminology has focused on high-risk samples, such as releasees from prison and serious offenders (Piehl 1998). This limits the generalizability of findings to other segments of the general population, including less serious offenders. The developmental literature has often focused on college populations, which generates similar concerns about generalizability of the findings (Herr 1999). Second, with some notable exceptions (e.g., Caspi et al. 1998; Sampson and Laub 1993), relatively few studies have collected prospective data on these issues over extended periods of time. However, it is unclear to which extent findings from these two studies would apply to the contemporary U.S. situation. Further empirical work is consequently much needed.

Study Goals

This study examined the prospective effects of involvement with the criminal justice system (as indexed by official arrests) on the early adult work career outcomes of being unemployed and fired from work for a sample of at-risk young men, while controlling for various propensity and heterogeneity factors to adjust these effects for spuriousness and competing influences. This included various family background and standard educational achievement measures, but also measures of drug use and mental health problems that affect the motivation and capacity to work and are commonly examined in developmentally oriented vocational research (e.g., Caspi et al. 1998; Vondracek et al. 1986). Briefly, longitudinal research has indicated that poor school performance and low educational attainment are predictors of unemployment and differing work career pathways in early adulthood (Caspi et al. 1998; Kokko, Pulkkinen, and Puustinen 2000; Sanford et al. 1994). Individuals with mental health problems may lack the necessary social skills to interact competently with potential employers and, thus, have problems acquiring a job (Layton and Eysenck 1985). Like the disabling influence of mental health problems, the symptoms associated with higher levels of substance use may interfere with job performance, cause absenteeism, and ultimately lead to job termination and chronic unemployment. Drug use has indeed been found to be related to subsequent job mobility (e.g., Kandel and Yamaguchi 1987), and excessive drinking patterns were related to drifting from job to job or being fired from a job (Sampson and Laub 1997). Although developmental theories of crime (e.g., Patterson and Yoerger 1993) would view many of these factors as co-occurring problems and/or secondary outcomes of early onset delinquency, it is important to recognize that they also may arise from independent sources and thus partially capture competing explanatory processes. Adjusting the prospective effects of juvenile arrests on labor market outcomes for these (potentially competing) factors is crucial.

The present study extended previous work from Wiesner et al. (2003) with the same sample in three ways: First, employment outcomes were assessed across a 9-year period until ages 29/30 years. The previous study covered only a 3-year period until ages 23/24 years. Second, it included a direct test of the hypothesis that early onset of criminal offending is linked to more secondary problems, including failures in the vocational career domain, than is later onset of offending. The previous study just focused on the number of juvenile arrests. Third, these questions were examined for two measures of young-adult work career outcomes, namely total

number of months being unemployed and number of times being fired from a job. Although several previous studies included measures of more than one young-adult work outcome (e.g., Bushway 1998), the present study is unusual insofar as it allowed for examination of these issues for two distinct indicators of problems in the work domain, each of which might have different association patterns. Summarizing, the present study examined predictive effects of (a) number of official juvenile arrests and (b) early versus late juvenile onset of criminal careers on two young-adult work outcomes. We hypothesized that a higher number of juvenile arrests and an early onset of offending would be related to poorer outcomes in the work domain. Prospective effects were adjusted for exposure time (number of months in the labor market), parents' socioeconomic status (SES), parental antisocial behavior in childhood as an early family background risk indicator (based on Hagan 1993), poor child inhibitory control to adjust for early propensity to antisocial behavior, adolescent academic achievement, adolescent substance use, low educational attainment in young adulthood, occurrence of mental health problems by young adulthood, early adult substance use, and number of adult arrests (to adjust for more recent criminal activity). All predictor variables were measured prior to assessment of the young-adult work career outcomes.

Method

Sample

The analyses were conducted using data from the OYS, an ongoing multiagent and multimethod longitudinal study. A sample of boys was recruited from schools in the higher crime neighborhoods of a medium-sized metropolitan region in the Pacific Northwest. Thus, the boys were considered to be at risk for developing subsequent delinquency (i.e., an at-risk sample) by virtue of living in higher crime neighborhoods, but they were not necessarily showing elevated levels of antisocial behavior at the time of recruitment. All boys in the 4th grade classrooms in the selected schools were invited to participate in the study. Of the eligible families, 206 agreed to participate (a 74.4% participation rate). The OYS consists of two successive Grade 4 (ages 9-10 years) cohorts of 102 and 104 boys, recruited in 1983-84 and 1984-85 (see Capaldi and Patterson 1987). The average retention rate was 98% through the early 20s, and 94% of living participants still remained as part of the panel in Year 20. The two cohorts had very similar demographic characteristics and were combined for the current analyses. The sample was predominantly Caucasian (90%), 75% lower or working class, and over 20% received some form of unemployment or welfare assistance in the first year of the study, a recession year for the local economy (Patterson, Reid, and Dishion 1992). Three young men who died were excluded from the analyses. Hence, the final sample size was 203.

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), six telephone interviews that provided multiple samples of recent behaviors, home observations (a total of three 45-minute observations), videotaped interaction tasks, school data, and court records data. Family consent was mandatory. Participants were compensated for their time at each assessment wave.

Measures

Total number of months being unemployed—At assessment Waves 13-21, roughly from the participants' 21st to 29th birthday, the young men provided very detailed accounts of their employment history in the past year via structured interviews (e.g., kind of job, kind of education, dates of (un)employment, hours worked per month, fired from job). From this information, the total number of months of unemployment across this 9-year period was

calculated, excluding only unemployment periods resulting from disability, being a student, or incarceration.

Number of times being fired from job—This variable also was derived from the self-reported employment histories of the young men (see above for details). It was calculated as the total number of times being fired from a job across Waves 13-21. Note that those who were fired were typically employed in a new job within less than a month (in which case the men received a count of “0” for the given month on the number of months unemployed measure), so that there was minimal overlap between the two work career outcome measures used in this study.

Exposure time—On the basis of the self-reported employment histories, the total number of months in the labor market across the 9-year period was calculated for each participant. From this count, only those months were excluded during which the young men were on disability, a student, or incarcerated. Higher values indicated that the young men were in the labor market for a larger number of months.

Childhood predictors—Childhood measures were assessed at Wave 1 when the boys were ages 9-10 years, and included measures of parents' SES (i.e., Hollingshead 1975) and parental antisocial behavior. The construct of *parents' antisocial behavior* consisted of three indicators: number of arrests; number of driver's license suspensions; and a summary score of two subscales from the MMPI (Hathaway and McKinley 1943), hypomania and psychopathic deviate. The State of Oregon arrest and Department of Motor Vehicles records were collected at Wave 1. The MMPI was assessed at Wave 2. An average score was computed to indicate parents' antisocial behavior. The construct of *poor child inhibitory control* at Wave 1 was composed of two indicators: parent ratings using nine items each from the Child Behavior Checklist (Achenbach 1991; e.g., my son is impulsive or acts without thinking), and teacher ratings using the same set of nine items from this instrument (e.g., the boy can't sit still/restless/hyperactive). Higher scores indicated poorer inhibitory control of the boy.

Adolescent predictors—The adolescent measures were computed using data from several assessment waves. The number of waves varied across measures because some indicators were not obtained at every wave.

Official juvenile arrests—Court records of juvenile arrests were collected yearly from all counties in which each boy had lived. From these records, a variable was computed that indicated the total number of arrests from Waves 4 to 9 (i.e., from 12/13 to 17/18 years of age), excluding only arrests for traffic offenses. About 45.8% of the young men were never arrested as juveniles, whereas the rest had one or more juvenile arrest (range 1-26). Out of the total number of juvenile arrests, 16.4% were for felony theft, 19.7% for misdemeanor theft, 7.3% for misdemeanor violence, 2.6% for felony violence, 1.6% for minor substance use, and 1.9% for sex-related felony.

Early starter/late starter classification—From the court records, three groups were distinguished based on previous work of Patterson and Yoerger (1993, 1997). *Early starters* encompassed those with the first arrest before age 14 years (25.6%, $n = 52$), and *late starters* encompassed those with the first arrest between age 14 and 17.99 years (28.6%, $n = 58$). *Nonoffenders* had no history of juvenile arrests (45.8%, $n = 93$).

Substance use—The frequency of the boys' use of alcohol, marijuana, and hard drugs in the past year was reported by the boys (five items) and the parents (four items). Items were rated on an eight-point scale from 0 (*never*) to 7 (*once or more a day in the last year*). The

correlations between self-reports and parent reports ranged from .45 to .55. A composite score was formed by averaging across the parent and boy reports at Waves 5, 7, and 9 (corresponding to ages 13/14, 15/16, and 17/18 years). Higher scores indicated a higher frequency of substance use in the past year.

Academic achievement—This composite variable was computed from 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). Correlations between the three indicators ranged from .49 to .74. The indicators were standardized before total scores were computed and then averaged across Waves 5, 7, and 9 (corresponding to ages 13/14, 15/16, and 17/18 years). Higher scores indicated higher academic achievement.

Young-adult predictors—Almost all young-adult measures were computed using data from several assessment waves. None of the young-adult measures overlapped with the period when employment history data were collected. *Low educational attainment* at age 20/21 years was based on information in the men's annual structured interviews and a one-time search of their school and state records to verify high school graduations and GED diplomas. At ages 20/21 years, 70 young men had left high school without a degree, 33 had obtained a GED or high school diploma, 95 had obtained a regular high school degree, and 4 had a higher educational degree. For this study, two dummy variables were created (1 = *no high school graduation*, 0 = *other*; and 1 = *GED/high school diploma*, 0 = *other*).

Mental health problems—At several waves, the boys and the parents reported in the structured interviews whether the boy was diagnosed as having a psychological disorder (if yes: which one), whether he was taking prescribed psychopharmacological drugs such as antidepressants, and whether he was treated for a specific mental health problem in the past year (if yes: for which one). From these data, a binary variable was computed that indicated whether, according to any of the items, the boy ever had mental health problems by age 20/21 years (0 = *no indication of mental health problems*, 1 = *yes, mental health problems occurred*). A total of 44 boys had experienced mental health problems at least once in their life according to these self- and parent-report data (61.4% depression, 25.0% anxiety and depression, 13.6% other forms, e.g., obsessive-compulsive disorder or paranoid schizophrenia). Externalizing mental health problems that were already covered by other predictors (e.g., substance abuse) were not included in this score.

Adult Substance Use—This indicator was derived from the men's self-reports at age 20-21 years. The men reported for each of eight substances (beer, wine, hard liquor, marijuana, cocaine/crack, hallucinogens, opiates, other not over-the-counter drugs) how many times they had consumed it during the last year. A composite score was formed by averaging across the eight items. Higher scores indicated higher levels of substance use in the past year.

Adult arrests—Adult court record searches were conducted locally for the young men annually. From these records, the total number of adult arrests was derived for each participant from Waves 10-12 (i.e., from ages 18/19 to 20/21 years), excluding only arrests for minor traffic violations or contempt of court. About 70.4% of the young men had no adult arrests, whereas the rest had one or more adult arrest (range 1-12). Out of the total number of adult arrests, 18.5% were for felony theft, 10.3% for misdemeanor theft, 7.5% for misdemeanor violence, 2.7% for felony violence, 7.5% for misdemeanor substance use, and 4.1% for felony substance use offenses.

Data Analysis

Some of the childhood and adolescent measures were *composite variables*. They were formed using the general strategy for building composite variables described by Capaldi and Patterson (1989) and Patterson et al. (1992). For composite variables that were formed from indicators with differing response formats, indicators were standardized before averaging them. This resulted in mean values close to zero.

Similar to previous research in this field (e.g., Caspi et al. 1998), tobit regression analysis (Tobin 1958) was used to test the study hypotheses for the first outcome variable, namely, total number of months unemployed. Tobit regression was developed for limited dependent variables where (a) the dependent variable is a normally distributed but incompletely observed outcome (e.g., censored cases may all have the score 0, as in the present study) and (b) the process generating variation in the censoring outcome (i.e., whether a score on the true outcome exceeds the censoring threshold) is assumed to be the same as the process that generates variation in the dependent variable, conditional on our being able to observe the outcome (Schmidt and Witte 1984). The second characteristic is the so-called proportionality assumption of the conventional tobit estimator. Recent work has stressed the importance of testing the proportionality assumption and argued that the more general model specification from Cragg (1971), which relaxes this assumption, may often fit the data better than the conventional model specification (Smith and Brame 2003). Within the Cragg model specification, it is assumed that different processes generate the censoring outcome (modeled via probit regression analysis) as well as the observed variation in the outcome conditional on no censoring (modeled via truncated regression analysis). The Cragg specification includes the conventional tobit specification as a special case.

For the second outcome measure, number of times being fired from job, the Poisson regression model was used. It was developed for dependent variables that are count data. Specifically, the probability of a count is determined by a Poisson distribution, where the mean of the distribution is a function of the independent variables and the conditional mean of the outcome is equal to the conditional variance (Cameron and Trivedi 1998; Long 1997). If this assumption of equidispersion is violated, then alternative model specifications, such as the Negative Binomial Regression model, can be chosen which permit overdispersion. Analyses were conducted using Greene's (2003) LIMDEP (Version 8.0.10) econometrics program (Econometrics Software, 1996-2003).

Results

Variable Descriptions

Descriptive statistics for the study variables are shown in Table 1. The distribution of the total number of months being unemployed across the 9-year period ranged from 0 to 66 and was clearly non-normal (mean = 9.27, $SD = 11.77$, median = 5, third quartile = 13, mode = 0, skewness = 2.08, kurtosis = 5.21). About 24.1% of the young men were never unemployed across the study period, and 13.1% of the young men reported the experience of one or more unemployment periods that lasted a minimum of 12 consecutive months. Next, approximately 70% of the young men did not report being fired from a job across the 9-year period. The maximum number of times being fired was five (occurring for 1% of the sample). Further, there was considerable variability in exposure time, with the total number of months being in the labor market ranging from 9 to 108 across the 9-year period (mean = 97.33, $SD = 14.09$, median = 102, third quartile = 104, mode = 102). Among those who had a job at the beginning of the observation period (i.e., 21st birthday), 57.6% were engaged in semiskilled work or lower, and 6.8% were in the military. At the end of the observation period (i.e., 29th birthday),

35.3% of those who had a job were engaged in semiskilled work or lower, and 0.6% were in the military.

Finally, the correlations among the predictor variables ranged from $r = -0.37$ to $+0.48$ in magnitude. Specifically, poor child inhibitory control was positively related to number of juvenile arrests ($r = .38, p < .001$) and to leaving high school without a degree ($r = .35, p < .001$). Adolescent substance use was positively associated with the number of juvenile arrests ($r = 0.48, p < .001$) and young adult substance use ($r = .32, p < .001$). The number of juvenile arrests was positively associated with number of adult arrests ($r = 0.36, p < .001$), and adolescent academic achievement was inversely related to adolescent substance use ($r = -0.37, p < .001$). All other bivariate correlations were smaller in magnitude. In general, bivariate correlations were in the expected direction.

Predicting the Number of Months Unemployed

Because approximately 24% of the young men had zero months of unemployment and thus were censored cases, prospective effects of juvenile arrests and onset of offending, respectively, on the outcome measure were examined using the tobit regression model (i.e., censored at the value 0). Predictive effects were controlled for SES, exposure time (total number of months in the labor market), parental antisocial behavior, poor child inhibitory control, adolescent substance use, adolescent academic achievement, occurrence of mental health problems, low educational attainment in early adulthood, young adult substance use, and number of adult arrests. Similar to other work (Smith and Brame 2003), the natural logarithmic transformation was applied to the dependent variable prior to analysis, with a constant of 1 added to account for cases with the raw score of zero. Two different sets of predictors were used. In the first model, the total number of official juvenile arrests was used as a predictor and controlled for the effects of all other variables mentioned above. In the second model, the number of juvenile arrests was substituted with onset of juvenile arrests as the predictor, again controlling for all other variables. For this categorical predictor variable, two contrast-coded variables were created: *Contrast 1* compared the two offender groups (early starters, late starters) combined with the nonoffender group; *Contrast 2* compared the early starters with the late starters.

Prediction model with number of juvenile arrests—As suggested by Smith and Brame (2003), the first step was to test whether the proportionality assumption of the conventional tobit model was consistent with the data. The likelihood ratio test indicated that this assumption was violated and that the more general Cragg model specification provided a better fit to the data than the conventional tobit model specification ($-LL_{\text{Cragg}} = -152.83$, $-LL_{\text{Tobit}} = -191.25$, $\chi^2_{(13)} = 76.85, p < .001$). Thus the probability of being unemployed (yes versus no) was related to different factors than the expected number of months unemployed for those who had experienced unemployment at least once. Likelihood ratio tests indicated that the full Cragg model with all predictor variables was significantly better than the intercept-only Cragg model ($-LL_{\text{Full}} = -97.90$, $-LL_{\text{Intercept-only}} = -112.19$, $\chi^2_{(12)} = 27.93, p < .01$ for the probit regression component; $-LL_{\text{Full}} = -54.93$, $-LL_{\text{Intercept-only}} = -70.78$, $\chi^2_{(12)} = 31.72, p < .01$ for the truncated regression component).

Table 2 contains the findings for the Cragg model specification. Univariate regression coefficients are also shown in the table for comparison purposes. As can be seen, the probability of being unemployed was significantly predicted by exposure time in the labor market ($b = -.03, SE = .01, p < .05$), controlling for all other predictors. For those who had experienced unemployment at least once, the number of months unemployed was significantly predicted by number of official juvenile arrests ($b = .01, SE = .01, p < .05$) and occurrence of mental health problems ($b = .18, SE = .07, p < .05$), controlling for all other predictors. Thus, a higher

number of juvenile arrests and the occurrence of mental health problems until ages 19-20 were linked to a higher expected number of months being unemployed. None of the other variables, including number of adult arrests, had significant predictive effects in the multivariate prediction model. Visual inspection of residuals did not reveal outliers that might have strongly affected the results.

Prediction model with onset of juvenile arrests—Analogous analyses were conducted with onset of juvenile arrests as the predictor (results not shown; a table of results is available from the first author on request). According to the multivariate Cragg model specification ($-LL = -153.18$), onset of juvenile arrests did not significantly predict the probability of being unemployed ($b = -0.05$, $SE = 0.17$, $p > .10$ for Contrast 1; $b = 0.06$, $SE = 0.16$, $p > .10$ for Contrast 2), controlling for all other predictors. The univariate regression coefficients for these two contrast-coded predictors revealed the same pattern of associations. Onset of juvenile arrests also did not significantly predict the expected number of months unemployed conditional on having been unemployed ($b = 0.09$, $SE = 0.05$, $p = 0.051$ for Contrast 1; $b = 0.03$, $SE = 0.04$, $p > .10$ for Contrast 2), controlling for all other variables. Note that the univariate regression coefficient for Contrast 1 was significant, indicating that early and late starters combined were linked to a significantly higher expected number of months being unemployed compared to nonoffenders, whereas even the univariate effect for Contrast 2 (early versus late juvenile onset) was not significant.

Predicting the Number of Times Being Fired From Job

Prospective effects of juvenile arrests and onset of offending, respectively, on the number of times being fired from a job were investigated using the Poisson regression model, which is well-suited for the analysis of count variables. Predictive effects were controlled for SES, exposure time (total number of months in the labor market), parental antisocial behavior, poor child inhibitory control, adolescent substance use, adolescent academic achievement, occurrence of mental health problems, low educational attainment in early adulthood, young adult substance use, and number of adult arrests. Two different sets of predictors were used. In the first model, total number of official juvenile arrests was used as the predictor, controlling for the effects of all other variables mentioned above. In the second model, the onset of juvenile arrests replaced the number of juvenile arrests as the predictor (using the two contrast-coded variables described above), again controlling for all other variables.

Prediction model with number of juvenile arrests—The likelihood ratio test for goodness-of-fit indicated that the full Poisson model with all predictors was significantly better than the intercept-only Poisson model ($\chi^2_{(12)} = 53.17$, $p < .001$). Furthermore, the likelihood ratio test for overdispersion indicated that the Negative Binomial model provided a significantly better fit to the data than the Poisson model ($\chi^2_{(1)} = 9.18$, $p < .01$). Zero-inflated extensions of both models were also tested, but either failed to converge or did not provide a better fit to the data. Hence, the Negative Binomial Model was chosen as the final model. A comparison of observed and predicted frequencies revealed that it closely described the data (see Figure 1), though the deviations were slightly larger (but still acceptable) for being fired four times from work. The likelihood ratio test for goodness of fit indicated that the full Negative Binomial model with all predictors was significantly better than the intercept-only Negative Binomial model ($-LL_{Full} = -177.53$, $-LL_{Restricted} = -193.25$, $\chi^2_{(12)} = 31.46$, $p < .01$).

Table 3 contains the results for the Negative Binomial Model. Univariate regression coefficients are also shown for comparison purposes. As can be seen, only two variables had significant predictive effects to being fired from work controlling for all other predictors, namely, poor child inhibitory control ($b = 0.40$, $SE = 0.17$, $p < .05$) and adolescent substance use ($b = 0.92$, $SE = 0.29$, $p < .01$). Poorer child inhibitory control and a higher frequency of

substance use in adolescence increased the expected number of times being fired by a factor (exponentiated coefficient) of 1.49 and 2.51, respectively. In contrast, the number of juvenile arrests and adult arrests were not significant predictors in the multivariate prediction model. Visual inspection of residuals again gave little indication that findings were significantly affected by outliers. However, because relatively few men had been fired from work four or five times, the analyses were repeated collapsing the categories being fired three, four, and five times into a single category in order to evaluate the extent to which the findings rested on small counts in the higher categories. These follow-up analyses revealed little change in the main substantive findings.

Prediction model with onset of juvenile arrests—Analogous analyses were conducted with onset of juvenile arrests as a predictor (results not shown; a table of results is available from the first author on request). Note that the univariate regression coefficient was significant and in the expected direction for Contrast 1 ($b = 0.50$, $SE = 0.18$, $p < .01$), indicating that early and late onset juvenile offenders combined were related to a higher number of times of being fired compared to nonoffenders. However, again, the univariate coefficient was not significant for Contrast 2 ($b = 0.04$, $SE = 0.16$, $p > .10$), which compared early versus late onset juvenile offenders. However, when all other predictor variables were included in the multivariate Negative Binomial Regression Model ($-LL = -178.12$), onset of arrests was no longer a significant predictor of the number of times being fired from a job ($b = 0.13$, $SE = 0.21$, $p > .10$ for Contrast 1, $b = -0.06$, $SE = 0.17$, $p > .10$ for Contrast 2).

Discussion

This study examined prospective effects of involvement with the criminal justice system, as indexed by official arrests, on two employment outcomes for 203 at-risk young men. Findings showed detrimental effects of a higher number of juvenile arrests and the occurrence of mental health problems on subsequent unemployment in the twenties. In addition, the number of times being fired was predicted by poor child inhibitory control and adolescent substance use. In contrast to predictions from developmental theories of crime, early onset of juvenile offending was not significantly linked to poorer outcomes for either indicator of employment problems relative to late onset of juvenile offending.

This suggests that, as expected, involvement with the criminal justice system is indeed linked to poorer young-adult work outcomes. As the models were controlled for various other factors, a considerable degree of spuriousness was removed from the estimated prospective effect of official arrests. Because the effects of official arrests persisted after controlling for poor child inhibitory control, this allows ruling out the argument from propensity theory that this association is merely the result of low self-control in early years. At the same time, the adverse effects of being arrested during the adolescent years appeared to be more specific in nature and emerged only for unemployment months but not for being fired from a job. It may be that official contact with the criminal justice system (i.e., being arrested) is not an important predictor of being fired from work because criminal background checks are often conducted during the hiring process. Only those who pass this initial hurdle and succeed in obtaining a job are thereafter at risk for being fired.

Moreover, the effects of official contact with the criminal justice system were only significant for juvenile arrests and not for adult arrests. It is not entirely clear why adult arrests failed to emerge as a significant predictor of unemployment months. Our best guess is that this may be a function of the chosen three-year time-window (i.e., resulting in a relatively low proportion of participants being arrested as adults). Nevertheless, this finding is quite interesting in the context of common juvenile court practices of sealing or purging records and restricting access to juvenile court records to avoid stigmatizing juvenile offenders (see Feld 1998). It implies

that labeling and stigmatization effects, which are especially highlighted in the work from Becker (1963) and Sampson and Laub (1993), are unlikely to be the major force accounting for the link between (juvenile) arrests and unemployment months observed for the OYS sample. Rather, the findings appear to be more congruent with the process posited by Hagan (1993). The more specific indirect effects hypothesized by Hagan (1993), however, were not tested in this study because the necessary measures were not available for the OYS. Other possible explanations of the observed association between juvenile arrests and unemployment months must also be considered.

Additional cumulative consequences and secondary problems of juvenile offending not assessed in this study, including a relative lack of prosocial skills, could be a third partial explanation for the limited employment opportunities in the OYS sample. Of particular interest in this context is the possibility that young men with a history of juvenile arrests later became employed in sections of the labor market which are generally more unstable and thus linked to increased risk for unemployment. Albeit this proposition was not systematically tested in the present study, our findings showed that a considerable portion of the young men managed to move from semiskilled or lower jobs to presumably more secure positions over time, whereas only a small portion of the participants joined the military which can open the door to more stable employment patterns. This is an important avenue for further research.

Interestingly, adolescent substance use was a major predictor of being fired from a job during the young-adult years, above and beyond the effects of juvenile offending and young adult substance use. The significant predictive effect of adolescent substance use on being fired from a job is consistent with observations from qualitative analyses with regard to the role of excessive drinking (Sampson and Laub 1997) and findings from some empirical studies (e.g., Kandel and Yamaguchi 1987). It is also possible that high substance users in adolescence were more likely to be using illicit substances in young adulthood. This is consistent with the self-reported reasons for being fired from a job: Though these reports were not available for every single incident, some of the young men reported in other sections of the annual structured interviews that they were fired after having failed a drug test at work, thus validating our results.

The specificity in prospective associations for this at-risk sample underscores the need to examine several distinct dimensions of young-adult work outcomes in order to obtain a more comprehensive understanding of these issues. Those who do not finish high school and who use substances to some problematic level may be motivated to work but may lack the cognitive ability and skills to perform the job adequately in the former case and show erratic behavior and attendance patterns at work in the latter case. Academic achievement and low educational attainment in the absence of other problem behaviors may be more closely related to occupational status and income levels than to being unemployed or fired. Further, future research might examine qualitative features of young-adult work experiences (e.g., conflicts and interactions with co-workers and supervisors at work, job attitudes, and work motivation).

The absence of significant prospective effects of early versus late onset of official arrests in adolescence on either young-adult work outcome was a particularly important finding. This indicates that a key contention from major developmental theories of crime (e.g., Moffitt 1993; Patterson and Yoerger 1993) did not receive empirical support. One reason is likely to be that the onset age of criminal careers might be a less salient predictor of young-adult work outcomes than developmental pathway measures indicating high-level chronic engagement in serious offending across extended time periods. The results from Nagin et al. (1995) indeed provide preliminary support for this speculation. Secondly, the onset age of criminal careers could be related more strongly to employment in less skilled, low-quality, or low-income jobs, rather than to the two outcome measures examined in the present study. Early onset of offending

may cut short time spent on obtaining educational credentials and degrees, thereby precluding many work opportunities in higher quality jobs. This should be explored in further research.

Only one proximal factor from young adulthood (mental health problems) significantly predicted work career outcomes (i.e., unemployment), controlling for childhood and adolescent predictors. Mental health problems likely affect the ability and motivation to (seek) work, interfere with carrying out job-related activities, and create problems in the work-place by alienating customers, coworkers and supervisors with erratic or unpredictable behaviors. For instance, depressed men, who suffer from diminished interest in daily activities and from loss of energy, may show little effort to find work or to excel at work, thus increasing the risk of unemployment and layoffs. The direction of the predictive effect in our study was generally consistent with much prior empirical work, but revealed again more specificity in the pattern of linkages than hypothesized because it emerged only for one outcome.

From an applied perspective, our findings document that important risk factors linked to young-adult work outcomes are already evident during the late childhood and adolescent years, so early intervention is important. Moreover, they suggest that work intervention programs for young adults likely need to target multiple problem layers, perhaps combining treatment for substance use or mental health problems, vocational training, and employment services (Uggen and Staff 2001), because otherwise they may address only part of the problem (e.g., enhance employability, but not success in keeping jobs).

The findings of this study should be interpreted cautiously given the relatively small sample size. Replication with independent samples would be helpful. Second, predominantly Caucasian young men were studied, and this line of research must be extended to other ethnic groups and female samples. Third, the construct of mental health problems was not based on medical records or a diagnostic interview, but on self-reports from the boy and his parents. Nevertheless, this study also had several important strengths. The longitudinal design permitted prospective hypothesis tests and was able to use an unusually long-time period for assessing the vocational career outcomes. Many variables were obtained from multiple agents and gathered with multiple methods, furthering the reliability and validity of the measures. Finally, data from an empirically understudied, noncollege-bound population were examined.

In conclusion, the present study indicated that the onset age of offending alone was not a significant predictor of work outcomes. Rather, early propensity and cumulative risk factors during adolescence were far more significant in predicting the young men's work outcomes in their late 20s. These findings provide evidence that long-term effects of juvenile offending behavior should be understood in the context of other risk factors over time. Further research should focus on more specific interactive aspects of risk factors that lead to work outcomes.

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Bio Sketches

Dr. Margit Wiesner received her Ph.D. in developmental psychology in 1999 from the Friedrich Schiller University of Jena (Germany) and currently is Assistant Professor in the Department of Educational Psychology, University of Houston. Key research interests include developmental trajectories of offending and other problem behaviors during adolescence and young adulthood.

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Figure 1. Fitted (Dashed Lines) and Observed (Solid Lines) Relative Frequencies for Negative Binomial Regression Model Predicting the Number of Times Being Fired From a Job by Age 29/30 Years ($N = 203$).

Table 1
Descriptive Statistics for Study Variables (N = 203)

Variable	<i>M</i>	<i>SD</i>	%	<i>N</i>
Number of Months Unemployed ^a	9.27	11.77	-	-
Number of Times Fired From Job ^b	1.65	1.01		
Exposure Time (Mths. in Labor Market)	97.33	14.09	-	-
Age	10.09	0.49	-	-
Parents' SES	32.54	9.91	-	-
Parental Antisocial Behavior	0.01	1.13	-	-
Poor Child Inhibitory Control	-0.02	0.80		
Adolescent Academic Achievement	-0.05	0.77		
Adolescent Substance Use	0.57	0.48	-	-
Number of Juvenile Arrests	2.69	4.80	-	-
Adult Substance Use	0.97	0.67		
Number of Adult Arrests	0.76	1.69		
Onset of Juvenile Arrests Classification				
Early Starter	-	-	25.6	52
Late Starter	-	-	28.6	58
Nonoffenders	-	-	45.8	93
Occurrence of Mental Health Problems				
Yes, at least once	-	-	21.7	44
No mental health problems	-	-	78.3	159
Low Educational Attainment				
No High School Graduation	-	-	34.5	70
GED/High School Diploma	-	-	16.3	33
Regular High School Degree and Higher	-	-	49.3	100
Type of Employment at 21 st Birthday ^c				
Semiskilled or Lower Work			57.6	102
Skilled Manual Work			19.2	34
Clerical or Sales Work			11.3	20
Technical or Semiprofessional Work			2.8	5
Manager, Administrator, or Higher Executive			2.3	4
In Military			6.8	12

^aUntransformed raw scores, excluding the men without experience of unemployment.

^bExcluding the men without the experience of having been fired from a job.

^cDescriptives refer only to those men who had a job at the 21st birthday.

Table 2
Prediction of Log Number of Months Unemployed by Age 29/30 Years

Parameter	Probit Estimates (Probability of Being Unemployed)			Truncated Regression Estimates (Expected # months unemployed conditional on being unemployed)		
	Univariate		Multivariate	Univariate		Multivariate
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>b</i>	<i>SE</i>	<i>b</i>
Intercept	---	1.34	2.37	---	1.23***	1.23***
Exposure Time (in Labor Market)	-0.03*	0.01	-0.03*	-0.00	0.00	-0.00
Parents' SES	0.00	0.02	0.02	-0.01**	0.00	-0.01
Parental Antisocial Behavior	0.16	0.05	0.05	0.07*	0.03	0.05
Poor Child Inhibitory Control	0.30*	0.10	0.10	0.10*	0.04	0.00
Number of Juvenile Arrests	0.08*	0.03	0.03	0.02***	0.01	0.01*
Adolescent Substance Use	0.66**	0.14	0.14	0.17**	0.07	0.07
Adolescent Academic Achievement	-0.20	-0.14	-0.14	-0.12**	0.05	-0.03
Mental Health Problems (Yes)	0.06	-0.19	-0.19	0.18*	0.07	0.18*
No High School Graduation (Yes)	0.52*	0.33	0.33	0.16*	0.08	0.03
GED/High School Diploma (Yes)	0.87**	0.60	0.60	0.38	0.09	-0.04
Adult Substance Use	0.26	0.09	0.09	-0.00	0.05	-0.04
Number of Adult Arrests	0.26*	0.12	0.12	0.01	0.02	-0.02
Sigma (σ)					0.36***	0.36***
Cragg Model <i>Log-Likelihood</i>					-152.83	-152.83
Hosmer-Lemeshow Goodness of fit $\chi^2_{(7)}$ for Probit Estimates					9.41, <i>ns</i>	9.41, <i>ns</i>
McFadden <i>Pseudo-R</i> ² for Probit Estimates					0.13	0.13

Note. Parameter estimates (*b*) are unstandardized regression coefficients from the Cragg model specification.

*
 $p < .05$

**
 $p < .01$

 $p < .001$

Table 3
Prediction of the Number of Times Being Fired From Job by Age 29/30 Years

Parameter	Negative Binomial Regression Estimates		
	Univariate	Multivariate	
	<i>b</i>	<i>b</i>	<i>SE</i>
Intercept	---	-2.25*	1.12
Exposure Time (in Labor Market)	0.00	0.01	0.01
Parents' SES	-0.01	-0.01	0.01
Parental Antisocial Behavior	0.05	-0.05	0.12
Poor Child Inhibitory Control	0.62***	0.40*	0.17
Number of Juvenile Arrests	0.05	-0.04	0.03
Adolescent Substance Use	0.98***	0.92**	0.29
Adolescent Academic Achievement	-0.36	0.06	0.19
Mental Health Problems (Yes)	0.50	0.29	0.29
No High School Graduation (Yes)	0.89**	0.46	0.31
GED/High School Diploma (Yes)	0.70	0.28	0.39
Adult Substance Use	0.08	-0.05	0.20
Number of Adult Arrests	0.06	0.02	0.07
Dispersion (α)		0.72*	0.34
Model <i>Log-Likelihood</i>		-177.53	

Note. Parameter estimates (*b*) are unstandardized regression coefficients.

*
 $p < .05$

**
 $p < .01$

 $p < .001$