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Arrests, Recent Life Circumstances, and Recurrent Job Loss for At-Risk Young Men: An Event-History Analysis

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Abstract

This study used longitudinal data from 202 at-risk young men to examine effects of arrests, prior risk factors, and recent life circumstances on job loss across a 7-year period in early adulthood. Repeated failure-time continuous event-history analysis indicated that occurrence of job loss was primarily related to prior mental health problems, recent arrests, recent drug use, and recent being married/cohabitation. It is argued that long-term effects of criminal justice contact on employment outcomes should be understood in the context of (shared) prior risk factors and recent life circumstances.

Keywords

Offending; Job Loss; Event-History Analysis; Life Course

Many contemporary discussions of how criminal activities may lead to subsequent success and failure in work careers have their roots in developmental theories of crime that consider employment problems to be a key factor linking past offending to future offending (Bushway, 1998). At least two processes have been posited to explain the link between crime and subsequent work outcomes, namely failure to build human and social capital (Hagan, 1993) and labeling effects (Becker, 1963). Although there are important differences in the underlying frameworks, the two processes are likely interrelated in many cases.

Building on Granovetter (1985, 1992), Hagan (1993) has posited that the process of “social or criminal embeddedness” during the late childhood and adolescent years (i.e., continuing engagement in delinquency, 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, increases the risk for subsequent engagement in criminal activities. Formal sanctions of

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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. Hagan (1993) also cautioned that the association between delinquency and later work outcomes will likely be spurious to some extent because of shared prior risk factors.

Other scientists have particularly stressed the labeling and stigmatizing effects of contact with the criminal justice system, including a history of arrests, convictions, and incarceration, on later work outcomes (e.g., Becker, 1963). Sampson and Laub (1997) integrated such notions into their age-graded theory of informal social control and posited that contact with the criminal justice system as a consequence of prior criminal behavior is a key example of what they call the “process of cumulative disadvantage.” More specifically, 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 & Laub, 1993), which has been shown to increase subsequent adult offending (e.g., Sampson & Laub, 1990).

The current study examined the effect of factors related to social and criminal embeddedness and to labeling or stigmatization on employment across a 7-year period from ages 23–24 to 29–30 years for men from predominantly lower socioeconomic status (SES) backgrounds who had been studied since childhood (the Oregon Youth Study). Specifically, risk factors from childhood and adolescence, along with time-varying measures of recent life circumstances in early adulthood, were examined in multivariate event-history models predicting to job loss (including repeated job loss) across the early adult period. Whereas predictors from both theoretical perspectives were examined, competing hypotheses were not definitively tested because further measurement of mechanisms involved would have been required for such a test.

There is evidence supporting both of these theorized processes. Studies have shown that arrests, convictions, and incarcerations during adolescence and early adulthood have adverse consequences for later work outcomes, including income level, job stability, unemployment, and career pathways (e.g., Bushway, 1998; Freeman, 1991; Kerley, Benson, Lee, & Cullen, 2004; Needels, 1996; Sampson & Laub, 1993; Tanner, Davies, & O’Grady, 1999; Thornberry & Christenson, 1984; Western, 2002; Wiesner, Vondracek, Capaldi, & Porfeli, 2003), although these effects may not always be sustained over time (Grogger, 1995). For example, Bernburg and Krohn (2003) reported that the effect of official police intervention on later nonemployment was partially mediated by lower educational attainment. Regarding potential stigmatization effects, experimental studies and survey research have shown that many employers are reluctant to consider ex-offenders as potential employees (e.g., Boshier & Johnson, 1974; Buikhuisen & Dijksterhuis, 1971; Holzer, 1996; Pager, 2003), although the associations between conducting criminal background checks and actual hiring decisions seem to be more complex than one might expect (Stoll & Bushway, 2008). 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 (Stoll & Bushway, 2008). These results suggest that labeling and stigmatization effects contribute to ex-offenders becoming entrapped in a deviant life style but are unlikely to be the only process accounting for the crime-work link.

Limitations of Existing Research

Studies of the effects of crime on employment failure have been limited by several factors. First, relatively few studies (for an exception, see Western, 2002) have adjusted the effects of criminal activity and criminal justice contact on later employment outcomes for shared risk

factors that could render effects spurious in nature--such as low self-control (Gottfredson & Hirschi, 1990)--and for labor-market demand-side factors--such as job sector, type of occupation, and other job characteristics--that capture different opportunity structures for job separations and other work career outcomes. Failure to control for such factors makes it more difficult to disentangle the exact mechanisms that account for links between prior crime and later work outcomes. To some extent, this problem can be alleviated by statistically controlling for unobserved heterogeneity (see Bushway, 1998).

Second, even less attention has been given in empirical work to adjusting the effects of crime and criminal justice contact on later work outcomes for other relevant local life circumstances (Horney, Osgood, & Marshall, 1995) that take place during the young-adult years, including changes in the family domain (e.g., marital status, parenthood) and individual behaviors (e.g., drug use). More recent sociological work has stressed the multiple interfaces between work and family life for many (though not all) contemporary young adults (e.g., Han & Moen, 1999; Osgood, Wayne, Eccles, Jacobs, & Barber, 2005). Consideration of time-varying recent life circumstances also fits well with the age-graded theory of informal social control from Sampson and Laub (1997, 2005). Although its main focus is on the prediction of crime over the life course, both authors would likely agree that social ties during the young-adult years might promote stable work careers (or even act as turning points in work careers) above and beyond the effects of childhood propensity, thus representing competing influences. But as noted by Bushway (1998), time-varying recent life circumstances might also affect both criminal justice contact and employment outcomes, thus rendering the effect of criminal justice contact on later work outcomes spurious. Controlling for recent life circumstances is consequently important.

A third limitation is that a large proportion of the empirical work 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 and community samples.

Fourth, with some notable exceptions (e.g., Caspi, Wright, Moffitt, & Silva, 1998; Sampson & Laub, 1993), study designs have rarely allowed for a dynamic analysis of effects of crime and other hypothesized factors on the timing of employment events across several years. Further empirical work on all these issues is, consequently, much needed.

Study Goals

The purpose of this longitudinal study was to examine the association of criminal justice contact (as indexed by official arrests), various prior risk factors, and recent life circumstances with job loss for a community sample of young men considered to be at risk for subsequent delinquent behavior, using a dynamic approach (event-history analysis with repeated events) with time-varying predictors and employment outcomes that were regularly assessed across a 7-year period from the early to the late 20s. This is a critical developmental period for young men to establish a successful employment pattern and a well-paying job.

Prior risk factors included family background variables, such as parental antisocial behavior in childhood as an early risk indicator (based on Hagan, 1993), standard educational achievement measures, experience of prior job separations, and developmental risk indicators - including measures of substance use and mental health problems that affect the motivation and capacity to work and are commonly examined in developmentally oriented vocational career research (e.g., Caspi et al., 1998; Ferreira, Santos, Fonseca, & Haase, 2007; Vondracek, Lerner, & Schulenberg, 1986). Poor child inhibitory control was included to adjust for a shared childhood risk factor, thus removing a considerable amount of spuriousness from the effects of arrests on job loss. According to Gottfredson and Hirschi (1990), individuals with low self-

control are at risk of both committing crime and having “difficulty meeting the obligations of structured employment” (p. 165). With respect to recent life circumstances during the early adult years, the study included measures of labor market supply-side (i.e., educational attainment) and demand-side (i.e., type of occupation) factors, drug use, parenthood, and being married/cohabitating. We hypothesized that higher levels on prior (shared) risk factors, more official arrests, and more drug use in early adult years would be related to an increased risk of experiencing adverse work outcomes, whereas parenthood, being married/cohabitating, a higher educational degree, and working in more skilled jobs would be related to a reduced risk of experiencing adverse work outcomes.

Summarizing evidence from prior studies supporting the inclusion of these prior risk factors and recent life circumstances in the current study, longitudinal research has indicated that labor-market supply-side factors, such as low educational attainment and poor school performance, are linked to unemployment and differing work career pathways in early adulthood (e.g., Caspi et al., 1998; Kokko, Pulkkinen, & Puustinen, 2000; Sanford et al., 1994). Labor-market demand-side factors, such as job sector, type of occupation, and other job characteristics, have also been found to be related to job mobility and other employment outcomes in several studies (e.g., Booth, Francesconi, & Garcia-Serrano, 1999; Kandel & Yamaguchi, 1987). 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 & Eysenck, 1985). Mental health problems also may interfere with job performance as a result of impaired concentration, reduced cognitive abilities, or absenteeism (Ettner, Frank, & Kessler, 1997). Various studies found adverse effects of mental health problems on early adult career pathways and other labor market outcomes (e.g., Ettner et al., 1997; Wiesner et al., 2003; Wiesner, Kim, & Capaldi, in press), but the association was not always supported by the data (e.g., Caspi et al., 1998). 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. Sampson and Laub (1997) noted in their qualitative analysis that heavy or abusive drinking patterns were related to drifting from job to job or being fired from a job. Excessive drinking in early adulthood had a negative effect on later job stability in their quantitative analysis (Sampson & Laub, 1993). Illicit drug use has been found to have adverse effects on job mobility, employment gaps, and duration of unemployment (e.g., Kandel, Chen, & Gill, 1995; Kandel & Davies, 1990; Kandel & Yamaguchi, 1987), although the effects seem to be less robust and more complex for other outcomes such as wages, occupational attainment, and labor supply (e.g., Kaestner, 1993; MacDonald & Pudney, 2000). There is also limited evidence that social ties in the family domain, as indexed by (changes in) marital status, are predictive of job length, job stability, employment gaps, and job mobility (e.g., Bushway, 1998; Kandel & Davies, 1990), but such associations have been studied far less systematically thus far.

This study extended previous work from Wiesner et al. (2003, in press) with the same sample in two critical ways: First, it used an analytical framework that allows controlling for the effects of more proximal life circumstances in the prediction of early adult work outcomes. Event-history analysis, predicated on knowing the timing between events, is especially well suited to dynamic analyses of work outcomes (Kandel & Yamaguchi, 1987) and can be easily extended to incorporate time-varying covariates (Box-Steffensmeier & Jones, 2004). It also takes into account censored cases whose histories are arbitrarily truncated by the timing of the assessment (i.e., men who have not yet experienced job loss by the end of the observational period). The exclusion of these cases from statistical analysis could lead to biases in the estimates of the effects of predictors on the given event (Box-Steffensmeier & Jones, 2004). The previous studies with this sample were not able to control for time-varying recent life circumstances during the early adult years. Second, the study questions were examined for the event job loss,

which was observed across an unusually long 7-year period until ages 29/30 years. Prior studies with this sample did not examine this labor market event outcome.

In sum, we hypothesized that the child and adolescent risk factors and the early adult factors would be associated with experiences of job loss. When risk factors were controlled for each other, we expected that prior arrest history, prior mental health problems, prior experiences of job loss, recent arrests, recent drug use, and recent family factors, along with job level attained, would be associated with job loss.

Method

Sample

The analyses were conducted using data from the Oregon Youth Study (OYS), 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 developing subsequent delinquency (i.e., an at-risk sample) when compared with others in the same region. Of the eligible families, 206 agreed to participate (a 74.4% participation rate). The OYS consists of two successive cohorts ($N = 102$ and $N = 104$, respectively) of Grade 4 (ages 9–10 years) boys, recruited in 1983–84 and 1984–85 (for details, see Capaldi & 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. Participants who moved out of the region were retained in the study, with interviewers traveling to assess them. 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, & Dishion, 1992). Young men who did not complete assessments, or were out of the labor force because of being on disability across the selected study period (as well as men who died), were excluded from the current analyses. Hence, the final sample size was 202.

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 records data), and court records data. Family consent was obtained. Participants were paid at each assessment wave.

Measures

Some of the predictors used in this study were *composite variables*. The general strategy for building composite variables in the OYS has been described by Capaldi and Patterson (1989) and Patterson et al. (1992). Using a three-stage process, several potential indicators were developed for each construct: First, the internal consistency of the a priori 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, resulting in variables with negative and positive values (this applies to

parental antisocial behavior, poor child inhibitory control, and academic achievement measures).

Job loss—Detailed accounts of the participants' employment history in the past year were available from the men's annual structured interviews across 7 years from ages 23–24 to 29–30 years (i.e., Waves 15–21). This included questions on the kind of job, kind of education, dates of (un)employment, hours worked per month, and reasons for no longer working in a given job. The potentially repeated occurrence of job loss during the 7-year period was determined from this self-report information. Similar to prior research by others (e.g., Kandel & Yamaguchi, 1987), *job loss* was defined as a job separation not followed by reemployment in a new job within a month. Note that job changes that involve more than 2 or 3 weeks of unemployment between jobs are used as a reasonable (albeit imperfect) proxy measure of involuntary job changes in labor economic research (e.g., Sherk, 2008; Stewart, 2000, 2002). Job separations that occurred because of incarceration, disability, job transfers/promotions within the same company, or ending of seasonal jobs (e.g., summer jobs that were preceded and followed by full-time college enrollment, steward on cruise ship to Alaska every 6 months) were excluded and treated as censored cases. This helped to reduce the heterogeneity of job separations and allowed us to examine job loss among young men who, by all indications, had not left the labor force.

Time-invariant predictors—Three time-invariant variables were assessed when the boys were ages 9–10 years (Wave 1); namely, parents' SES, parental antisocial behavior, and poor child inhibitory control. The other time-invariant predictors (i.e., adolescent academic achievement, adolescent substance use, number of arrests, experience of prior job separations, occurrence of mental health problems) were computed using data from several assessment waves. Note that the number of waves varied somewhat across the latter measures because some indicators were not obtained at every wave. None of the time-invariant predictors overlapped with the period when job mobility event data were collected.

Parents' SES was computed according to the Hollingshead-Index (Hollingshead, 1975) by using the parents' education and occupational status reported during the parent interview.

Parents' antisocial behavior was composed of three indicators: number of arrests; number of driver's license suspensions; and a summary score of two subscales from the Minnesota Multiphasic Personality Inventory (MMPI; Hathaway & McKinley, 1943), hypomania and psychopathic deviate. The State of Oregon arrest and Department of Motor Vehicles records were collected at Wave 1, and the MMPI was assessed at Wave 2. An average score was computed to indicate parents' antisocial behavior.

Poor child inhibitory control 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). The correlation between parent and teacher reports was $r = .38$ ($p < .01$). Higher scores indicated poorer inhibitory control of the boy at ages 9–10 years.

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 administered at school (SAT scores were taken 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.

Adolescent 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.

Prior number of official arrests—Court records of juvenile and adult arrests were collected yearly. When families moved to other communities, the local authorities were contacted for permission to conduct record searches in their jurisdictions. A detailed record was kept of all counties in which each boy had lived, and records were collected from all these counties. The arrest records included the date and type of each offense. From these records, a variable was computed that indicated the total number of arrests by ages 22–23 years (i.e., until Wave 14), excluding only arrests for traffic offenses. Out of the total number of arrests, 22% were for felony theft, 22% for misdemeanor theft, 9% for misdemeanor violence, 3% for felony violence, 3% for misdemeanor substance use, and 2% for felony substance use offenses. The remainder was spread over a number of categories, such as criminal mischief and other misdemeanors.

Prior job separations—A binary indicator was derived from the self-report employment-history data described further above. It indicated whether the men had experienced one or more job separations until ages 22–23 years (i.e., Wave 14; 1 = *Yes, at least once*; 0 = *No*).

Prior mental health problems—At several assessment waves, the boys' and the parents' reported in the structured interviews on whether the boy was diagnosed as having a psychological disorder (and 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 until ages 22–23 years (i.e., until Wave 14; 1 = *Yes, mental health problems occurred*; 0 = *No indication of mental health problems*). A total of 51 men had experienced mental health problems at least once in their life according to these self- and parent report data (56.9% depression, 25.5% anxiety and depression, 17.7% other forms—such as obsessive-compulsive disorder or paranoid schizophrenia). Note that externalizing mental health problems that were already covered by other predictor variables used in the study (e.g., substance abuse) were not included in this score.

Time-varying predictors—A total of six time-varying covariates were included in this study; namely, type of occupation, educational attainment, arrest in the past year, drug use, married/cohabitating, and fathering. They captured the young men's recent life circumstances (coded for each job) during ages 23–24 to 29–30 years (i.e., Waves 15–21). All time-varying covariates were lagged by one time-unit (see data analysis).

Type of occupation—This time-varying covariate was derived from the Hollingshead (1975) codes that were assigned to the job titles reported by the men in the employment history section of the annual structured interviews. Because of relatively small counts, the categories were collapsed as follows: *Semiskilled work or less* (1 = *Yes*, 0 = *No*; this category served as reference group and contained menial service work, unskilled work, and semiskilled work occupations), *Skilled manual work* (1 = *Yes*, 0 = *No*), *Clerical/Sales work* (1 = *Yes*, 0 = *No*), *Technical/ Semiprofessional work* (1 = *Yes*, 0 = *No*), *Manager/Administrator/Executive* (1 = *Yes*, 0 = *No*).

Educational attainment—This time-varying covariate was based on information from the annual structured interviews of the men and a one-time search of their school records and state records to verify high school graduations and General Educational Development (GED) diplomas. For this study, two dummy variables were created: the highest obtained educational degree was a *GED/high school degree* (1 = *Yes*, 0 = *No*) and the highest obtained educational degree was a *postsecondary degree* (1 = *Yes*, 0 = *No*). The reference category was men who completed high school without a degree.

Arrest in the past year—Adult court record searches were conducted locally for the young men annually. When families moved to other communities, the local authorities were contacted for permission to conduct record searches in their jurisdictions. The arrest records included the date and type of each offense. From these records, the time-varying covariate *been arrested one or more times in the past year* was derived (1 = *Yes, was arrested one or more times in past year*, 0 = *No*) for each participant, excluding only arrests for minor traffic violations or contempt of court.

Drug use levels—This time-varying covariate was derived from the men's annual self-reports in the structured interviews. The men reported for each of five substances (marijuana, opiates, hallucinogens, cocaine/crack, and 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 five items. Higher scores indicated higher levels of drug use in the past year.

Married/Cohabiting—This time-varying covariate was based on the men's annual self-reports in the structured interviews (e.g., questions about their marital status and household members). A binary indicator was formed from these reports indicating whether the men were married and cohabiting with a partner, respectively, in the past year (1 = *Yes*, 0 = *No*)

Fathering—This time-varying covariate was formed from the men's annual self-reports in the structured interviews (e.g., how often the young man saw the child in question in the past year). These ratings were gathered for each child of the man. From these self-report data, a dichotomous variable was created (1 = *Yes, lived with at least one of his children full- or part-time in the same household during the past year*, 0 = *No*).

Data Analysis

Event-history analysis methods (e.g., Box-Steffensmeier & Jones, 2004; Hosmer & Lemeshow, 1999; Therneau & Grambsch, 2000) were used to test the study hypotheses. These methods have been applied in other studies on job separations (e.g., Blossfeld & Rohwer, 2002; Booth et al., 1999; Kandel & Yamaguchi, 1987). Because a substantial number of the OYS men had multiple experiences of job loss across the 7-year period, predictive effects on the outcome were examined using event-history analysis for repeated ordered events of the same type. Ordered failure-time data refers to situations where there is a natural, sequential ordering of the event times, which necessitates the occurrence of one event prior to the experience of another event (Ezell, Land, & Cohen, 2003). Specifically, the discontinuous risk specification for the conditional time-gap model (Ezell et al., 2003; Prentice, Williams, & Peterson, 1981; Therneau & Grambsch, 2000) was used.

The conditional time-gap model was originally proposed by Prentice et al. (1981). It is an extension of the well-known Cox proportional hazards model derived for the specific purpose of modeling continuous-time multiple failure-time data (Ezell et al., 2003) and belongs to the family of variance-corrected models, which estimate the given model and then adjust the variance of the parameter estimates by clustering on the subject to account for the fact that the observations are repeated and thus not independent (see Box-Steffensmeier & Jones, 2004).¹

In the conditional time gap model, estimates are stratified on event number and the counting process formulation is adopted such that the risk for a subsequent (k th) event does not begin after the prior (k th-1) event has occurred (i.e., the clock or gap time is reset to zero after each event). The stratification is important because it allows the baseline hazard function to vary over each of the k events. The discontinuous risk specification (Therneau & Hamilton, 1997) was critical to account for time intervals during which the men were not at risk for experiencing the given event k . Several men in the OYS sample were removed from the risk pool for limited periods of time because of varying reasons, including being in jail, being a full-time student, being on disability, being a homemaker, long periods of unemployment, and taking a time-out from working to learn a foreign language overseas.

Statistical analyses were conducted using the software program STATA version 10 (StataCorp, 2007), which is well suited for the analysis of multiple failure-time data (Cleves, 1999; Cleves, Gould, & Gutierrez, 2004). STATA offers various statistical and graphical post-hoc procedures for model diagnostics. In the current study, *Cox-Snell residuals* were inspected to assess overall model adequacy and fit to the data, *Deviance residuals* to identify outliers and areas of misfit in the prediction model, *Schoenfeld residuals* to check for violations of the proportional hazards assumption, and *Martingale residuals* to examine the functional form of the covariates in the model (for details, see Cleves et al., 2004; StataCorp, 2007). The prediction models were estimated using the robust variance estimator (Lin & Wei, 1989) and the Efron method for handling ties in the event data. Because the higher-level strata contained relatively small numbers of events, they were aggregated into a single stratum (i.e., strata 6–9 for the event job loss) during data analysis, following a strategy outlined by Therneau and Grambsch (2000). Time-varying covariates were lagged by one time-unit to ensure that values of time-varying covariates did not change simultaneously with (or after) the event occurrence (see Box-Steffensmeier & Jones, 2004).

Results

Descriptives

Descriptive information for key sample characteristics is presented in Table 1. Note that standardization of variables resulted in mean levels close to zero for most time-invariant predictors. Overall, the pattern of bivariate associations (not shown) among the time-invariant predictors and the young-adult covariates (assessed at ages 23–24 years) was consistent with expectations and mostly revealed correlations of small to moderate size. The highest intercorrelations were between the following variables: Married/cohabitating was related to fathering ($r = .67, p < .001$), adolescent substance use was related to young-adult levels of drug use ($r = .45, p < .001$), poor child inhibitory control was associated with prior number of arrests ($r = .41, p < .001$), adolescent substance use was related to prior number of arrests ($r = .43, p < .001$), and adolescent academic achievement was associated with adolescent substance use ($r = -.38, p < .001$).

Of the 202 young men included in the study, 55.0% experienced one or more job losses across the 7-year period.² The average number of job losses for those men who experienced this event at least once across the 7-year period was 2.14 ($SD = 1.36$, mode = 1, median = 2, maximum = 6). Of the 238 job losses experienced in the OYS sample during this period, 9.7% occurred

¹Variance-corrected models also account for heterogeneity by adjusting the variance-covariance matrix but are limited insofar as they do not incorporate heterogeneity directly at the estimation stage. Recently, an extension has been proposed that allows for the incorporation of a frailty parameter into the conditional time-gap model (Box-Steffensmeier & De Boef, 2006; Box-Steffensmeier, De Boef, & Joyce, 2007). This hybrid model awaits implementation into major statistical software packages but holds great promise for the future analysis of repeated events data because it statistically controls for both event dependence (through event-based stratification) and unobserved heterogeneity (via a random effect).

because the men were fired, 21.9% because of lay offs, 31.9% because the men quit their job, 16.8% for other reasons (e.g., injury), and 19.8% for unknown reasons. This suggests that one half to two-thirds of the job losses were involuntary. The average number of months unemployed for those who experienced this event at least once was 5.40 ($SD = 3.35$, mode = 2, median = 4.5, maximum = 17) per job loss.

Prediction of Job Losses

Findings of the conditional time-gap model for the prediction of job loss are depicted in Table 2. The first column presents the univariate effects of each predictor on job loss. The second column presents the results for a multivariate model (Model 1) that includes only the time-invariant predictors, representing effects of prior risk factors that were assessed before the collection of job loss event data began. The third column shows the results for a multivariate model (Model 2) that includes only the young-adult time-varying covariates as predictors. They represent the effects of recent life circumstances experienced by the participants during the course of their vocational careers (i.e., while the job loss event data were collected). The fourth column displays the results for the final multivariate model (Model 3) that includes both time-invariant predictors and young-adult time-varying covariates. The last column presents the exponential version of the coefficients in Model 3. This model testing series was chosen to evaluate the robustness of significant predictive effects. As can be seen in Table 2, each multivariate model was significant as indicated by the Wald-test for the given prediction model.

Model 1—The univariate effects for the time-invariant predictors showed that poorer child inhibitory control, higher adolescent substance use, higher number of prior arrests, the experience of prior job separations, and the occurrence of prior mental health problems were significantly associated with an increased risk of experiencing job loss. When effects were controlled for all other time-invariant predictors in multivariate Model 1, only the effect of prior mental health problems on repeated job loss remained significant. The direction of this effect did not change compared with the univariate effect.

Model 2—The univariate effects for the young-adult time-varying covariates revealed that doing technical/semiprofessional work, working as a manager/administrator/executive, having a GED/high school degree, having a postsecondary degree, being married/cohabitating, and fathering were significantly associated with a reduced risk of experiencing job loss relative to the reference groups. Having been arrested and higher levels of drug use, in contrast, were linked to an increased risk for experiencing job loss. When effects were controlled for all other time-varying covariates in multivariate Model 2, only the effects of technical/semiprofessional work, highest educational degree, been arrested, drug use levels, and married/cohabitating on job loss remained significant. The direction of the effects did not change compared with the univariate effects.

Model 3—When effects of time-invariant predictors and young-adult time-varying covariates were all entered in the model (Model 3), only the effects of prior mental health problems, technical/semiprofessional work, recent arrest and drug use levels, and married/cohabitating on job loss remained significant. The direction of these effects did not change compared with

²Recent national survey data (Sherk, 2008) indicate that the rates of involuntary employment-to-unemployment transitions over the previous year have declined in the United States between 1976 to 2007 (from 10% to 5%), whereas rates of voluntary job-to-job transitions over the previous year have somewhat increased during the same time period (from 8% to 12%). An in-depth analysis of the difficulties in estimating such time trends is provided in Neumark (2000). Similar to these general population trends, the prevalence of experiencing one or more job losses across the 7-year period was lower in the current study compared with the one for job-to-job changes (55.0% versus 76.7% of the study participants). A total of 238 job losses and 472 job-to-job changes were experienced by the OYS men across the 7-year period. The majority of the job-to-job changes were self-initiated (73.1%), often because the men were tired of the job or supervisor and because they wanted to find a job with higher pay, and thus voluntary changes.

Models 1 and 2. The inspection of post-hoc model diagnostics for Model 3 revealed that the model fit to the data was good, even though the risk of experiencing job loss was slightly underestimated for a small subset of participants. There were no violations of the proportional hazards assumption and also no evidence of problems with outliers or significant curvilinearity for the included predictors and covariates.

Discussion

This longitudinal study examined prospective effects of involvement with the criminal justice system (as indexed by official arrests), prior risk factors, and recent life circumstances on job loss for 202 at-risk young men. The most salient predictors in the final multivariate model were prior mental health problems, criminal justice contact during the early adult years, and recent life circumstances (drug use, married/cohabitating). The employment sector and, therefore, self-selection into less skilled, low-paying jobs seemed to play only a minor role in the prediction of job loss. Because the effect of early adult criminal justice contact on job loss was adjusted for poor child inhibitory control, important sources of spuriousness were removed from the prediction estimate. In addition, as all time-varying predictors were lagged by one time-unit, changes in the covariates did not occur simultaneously with (or after) the event occurrence. This allows us to conclude with a reasonable degree of confidence that the effect of early adult criminal justice contact on job loss, for the most part, represented a causation effect. Because early adult criminal justice contact per definition did not include juvenile arrests (common court practices in the United States aim to avoid stigmatizing juvenile offenders by restricting access to juvenile court records and other means, see Feld, 1998), it is likely that labeling effects and stigmatization by potential employers provide a key explanation of this association, as hypothesized by Becker (1963) and Sampson and Laub (1993, 1997). However, the observed effect of early adult criminal justice contact on job loss is also congruent with other posited processes, including the notion that formal sanctioning of crime embedded the young men more firmly in criminal networks and diminished opportunities for securing legal employment because of reduced access to a network of local business contacts (Hagan, 1993). We were not able to disentangle these alternative explanations in the current study because the necessary measures are not available for the OYS. This is an important avenue for further research.

Another important finding was the strong evidence supporting the important role of recent life circumstances in the prediction of job loss. Because these effects were controlled for early propensity (poor child inhibitory control) and other risk factors, we conclude that early adult levels of drug use and being married/cohabitating likely captured competing influences on the risk of experiencing job loss among the OYS men, above and beyond the effects of childhood propensity and criminal justice system contact. Thus, we call on other researchers to incorporate systematically early adult recent life circumstances into this line of research, especially social ties in the family domain. Whereas the significant promotive effect for being married or cohabitating adds to a slowly growing body of empirical work in this area, support for the role of fathering in the prediction of job loss was considerably more tentative because only the univariate effect was significant. However, we suspect that this may have been the result of substantial overlap between the two social ties measures, which likely diminished the chances of finding unique predictive effects for fathering on job loss after controlling for being married/cohabitation. Further research might explore the predictive effects of social tie measures that target qualitative aspects of fathering (or more generally family relationships), for example commitment to being a father and sharing a meaningful life with his children, rather than status features such as whether the man regularly sees and/or lives together with his children.

Note that the current study examined the effects of criminal justice contact, prior risks, and recent life circumstances on job loss during one segment of the life course, namely the mid to late 20s. We do not know whether the same set of factors will continue to influence job loss in later stages of the men's work life. For instance, economic sociology suggests that the opportunity structures of job mobility may differ as a function of the life cycle or stage of the work career (e.g., Booth et al., 1999; Rosenfeld, 1992). A similar argument has been developed regarding the effects of incarceration on later earnings (see Western, Kling, & Weiman, 2001). Examination of more long-term labor market outcomes for the OYS men is consequently critical.

There is also a need to examine these issues for multiple labor market outcomes among young men because significant predictive effects may not always be consistent across different indicators of work outcomes. Other types of labor market events worthy of further exploration with event-history analysis methods include the occurrence of lay offs, quitting a job, being fired from a job, job change, completion of on-the-job training or mini-credentials (e.g., obtaining a truck driver license), and being promoted within the company. When we repeated the same set of analyses for another available event, job change, the findings for the OYS men were quite different (not shown). Namely, the risk for experiencing recurrent job changes was primarily a function of (differing opportunity structures in) the given employment sector, with men in more stable, more skilled, and better-paying occupations showing a significantly reduced risk of experiencing job change compared with the reference group. This illustrative example underscores the importance of addressing these issues for more than just one labor market outcome event. Application of another form of event-history analysis, namely competing risk models (for an overview, see Box-Steffensmeier & Jones, 2004), may also provide valuable insights. These types of models predict the risk of transitioning into one of several different states and, thus, would allow for evaluation of the consistency of predictive effects on voluntary job separations as opposed to involuntary job separations within the same model. This distinction seems highly relevant as many economic and sociological theories of job mobility focus just on voluntary job separations (e.g., theories of job matching). We did not adopt the competing risk model approach in the current study because the exact reasons for the job separations were unclear for a substantial subset of the events.

From an applied perspective, our findings document that important risk factors linked to young-adult labor market outcomes are already evident during the late childhood and adolescent years, notably prior mental health problems as a key risk factor for an increased risk of experiencing job loss during the mid to late 20s. Hence, early intervention is important from a prevention perspective. Moreover, the findings suggest that adult work intervention programs likely need to target multiple problem layers, perhaps combining treatment for substance use or mental health problems, vocational training, and employment services (Uggen & Staff, 2001). On the basis of this study, strong social ties to the family might be used to provide additional motivation for avoiding self-initiated job losses and increasing compliance with work intervention programs. Finally, the findings caution that it may not be realistic to expect treatment effects to be consistent across differing employment outcome indicators.

Although findings from the current study offer some intriguing insights, they should be interpreted cautiously for a number of reasons. First, the sample predominantly consisted of Caucasian young men. Ethnographic research from Sullivan (1989) suggests that the effects of criminal embeddedness and criminal justice contact on later employment outcomes might differ among ethnic groups. Consequently, this line of research must be extended to other ethnic groups. Of equal importance is studying these issues with contemporary young women who still face considerable challenges in aligning work and family careers (see Han & Moen, 1999). Hence, the pattern of associations might be somewhat different for women. Second, although other research has demonstrated that life-history calendar methods lead to reasonably

reliable data on the occurrence of events (e.g., Belli, Shay, & Stafford, 2001; Caspi et al., 1996), the possibility of recall bias remains. Individuals may remember only the more significant (or longer) employment spells as length of the recall period increases (Pierret, 2001), may report widely fluctuating event patterns less accurately (Freedman, Thompson, Camburn, Alwin, & Young-Demarco, 1988), or may not remember precisely the details of employment spells experienced many years ago (Paull, 1997). However, such problems were greatly minimized in the current study because the retrospective questions on employment history and relevant recent life circumstances targeted just the past year (as opposed to several years). 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, encompassing the period from late childhood to the late twenties, and covering 7 years of employment history, permitted prospective tests of the hypotheses and was able to use an unusually long-time period for assessing the job outcome measure. Many variables were obtained from multiple agents and gathered with multiple methods, furthering the reliability and validity of the measures. The predictors and time-varying covariates of young-adult job loss were examined for an empirically understudied, noncollege-bound population. In conclusion, the findings from this study provide evidence that further research should more systematically incorporate recent life circumstances into research on the long-term effects of crime and criminal justice contact on employment outcomes.

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Table 1Descriptive Statistics for the OYS Sample ($N = 202$)

Variable	<i>M</i>	<i>SD</i>	%	<i>N</i>
<i>Time-Invariant Predictors</i>				
Parents' SES	32.43	9.86	-	-
Parental Antisocial Behavior	0.03	1.17	-	-
Poor Child Inhibitory Control	-0.01	0.82	-	-
Adolescent Academic Achievement	-0.07	0.78	-	-
Adolescent Substance Use	0.58	0.49	-	-
Prior Number of Arrests	4.37	6.67	-	-
Prior Job Separations (1 = Yes)	-	-	73.80	149
Prior Occurrence of Mental Health Problems (1 = Yes)	-	-	25.20	51
<i>Young Adult Covariates (status at ages 23–24 years)</i>				
Type of Occupation ^a				
Semiskilled or Lower Work	-	-	42.86	84
Skilled Manual Work	-	-	30.10	59
Clerical or Sales Work	-	-	13.78	27
Technical or Semiprofessional Work	-	-	8.67	17
Manager, Administrator, or Higher Executive	-	-	3.57	7
In Military	-	-	0.51	1
Educational Attainment				
No High School Graduation	-	-	31.20	63
GED/High School Degree	-	-	58.71	118
Postsecondary Degree	-	-	9.95	20
Been Arrested in Past Year (1 = Yes)	-	-	14.93	30
Drug Use Levels in Past Year	0.52	0.70	-	-
Married/Cohabiting in Past Year (1 = Yes)	-	-	49.80	100
Fathering in Past Year (1 = Yes)	-	-	31.80	64

^aDescriptives refer only to those 196 men who had a job at ages 23–24 years (i.e., Wave 15).

Table 2

Event-History Analysis Findings for Recurrent Job Losses ($N = 238$ Failures)

Predictor	Multivariate Effects			
	Univariate Effect ^a	Model 1 ^b	Model 2 ^b	Model 3 ^b exp(B)
<i>Time-Invariant Predictors</i>				
Parental SES	-0.01	-0.01 (0.01)	---	-0.01 (0.01) 0.99
Parental Antisocial Behavior	0.08	0.02 (0.07)	---	0.01 (0.06) 1.01
Poor Child Inhibitory Control	0.24***	0.10 (0.08)	---	0.03 (0.08) 1.03
Adolescent Academic Achievement	-0.17	-0.03 (0.12)	---	-0.03 (0.13) 0.97
Adolescent Substance Use	0.29*	0.05 (0.15)	---	-0.02 (0.17) 0.98
Prior Number of Arrests	0.03***	0.02 (0.01)	---	0.01 (0.01) 1.01
Prior Job Separations (Yes)	0.60**	0.40 (0.21)	---	0.15 (0.22) 1.16
Prior Mental Health Problems (Yes)	0.42**	0.39* (0.18)	---	0.45** (0.17) 1.57
<i>Young Adult Time-Varying Covariates</i>				
Type of Occupation Past Year ^c (reference category is semiskilled work and less)				
- Skilled Manual Work	-0.25	---	-0.13 (0.16)	-0.08 (0.17) 0.93
- Clerical/Sales Work	-0.32	---	-0.37 (0.23)	-0.32 (0.25) 0.73
- Technical/Semiprofessional Work	-1.13**	---	-0.90** (0.31)	-0.84** (0.32) 0.43
- Manager/Administrator/Executive Work	-1.01**	---	-0.74 (0.40)	-0.70 (0.40) 0.50
Highest Educational Degree Past Year ^c (reference category is high school dropouts)				
- GED/High School Degree	-0.35*	---	-0.36* (0.15)	-0.24 (0.17) 0.79
- Postsecondary Degree	-0.90***	---	-0.56* (0.26)	-0.41 (0.29) 0.66
Been Arrested (Yes) Past Year ^c	1.06***	---	0.72*** (0.20)	0.72** (0.21) 2.06
Drug Use Levels Past Year ^c	0.31**	---	0.30** (0.09)	0.28** (0.10) 1.33
Married/Cohabiting (Yes) Past Year ^c	-0.60***	---	-0.44* (0.19)	-0.38* (0.19) 0.68
Fathering (Yes) Past Year ^c	-0.40**	---	-0.27 (0.18)	-0.32 (0.19) 0.72
<i>Model Statistics</i>				
Model LL	---	-947.78	-918.54	-912.23

Predictor	Multivariate Effects			
	Univariate Effect ^a	Model 1 ^b	Model 2 ^b	Model 3 ^b exp(B)
Model Wald Chi ² (df)	---	35.63 *** (8)	89.79 *** (10)	120.21 *** (18)
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Note. Models estimated using the robust variance estimator (Lin & Wei 1989) and the Efron method for handling ties.

^aRegression coefficient.

^bRegression coefficient. Standard errors in parentheses.

^cTime-varying variables (lagged by one time-unit) that vary from the job-to-job period.

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