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The Effect of Incarceration on Marriage and Work Over the Life Course

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The current study adopts the life course framework to examine the effect of incarceration on the likelihood of becoming married and attaining full-time employment. It is hypothesized that men who have been incarcerated will be less likely to marry and to gain full-time employment. Data from the National Longitudinal Survey of Youth are used to test the hypothesis. Results from the growth-curve models support the life-course theoretical model. Across all models estimated, incarceration is negatively associated with marriage and employment. In addition, positive milestones (e.g., education) are associated with improved chances of employment and marriage. The findings reinforce the importance of considering a multitude of life events when estimating life trajectories.

Keywords incarceration; marriage; work; employment

Introduction

Employment and marriage have emerged in the literature as central to understanding changes in offending over the life course (see Laub & Sampson, 2001 for a review). Research in this area has been based primarily on Sampson and Laub's (1993) age-graded social control theory of offending (see also Laub & Sampson, 1993, 2003; Sampson & Laub, 1990, 1992). Building on control theory (Hirschi, 1969), they argue that strong ties to social institutions, like marriage and employment, can inhibit offending by fostering informal social control and increasing social capital. Social bonds (e.g., marriage) provide individuals with a stake in conformity and create systems of obligation and restraint (Sampson &

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Laub, 1993, p. 141). In addition, social bonds increase social capital making possible the achievement of certain ends that would not have been previously available (see Coleman, 1988). Thus, investment in social bonds increases the costs of criminal activity further limiting the chances that an individual will become involved with deviant behavior.

Sampson and Laub also integrate elements of the broader life-course perspective (Elder, 1985) into their study of deviance. Consistent with this framework, they argue that changing connections to social institutions can produce different trajectories of both conformity and crime. In addition, variation in offending is linked to the timing of life events. Adolescent events (e.g., youthful incarceration) can alter life trajectories by attenuating the social and institutional bonds linking adults to conventional society (Laub & Sampson, 1993, p. 306). However, strong social bonds in adulthood can have unique, direct effects on delinquency, apart from juvenile bonds.

Numerous studies have highlighted the link between marriage, employment, and desistance, but very few have explored the effect of incarceration on marriage and employment. The empirical studies that have been conducted suggest that youthful incarceration can reduce chances for employment (see Western, Kling, & Weiman, 2001) and diminish opportunities for marriage (Farrington & West, 1995; Western, Lopoo, & McLanahan, 2004; Western & McLanahan, 2000), but the long-term effects of incarceration on adult employment and marriage are less clear.

The current work extends previous research in several ways. First, marriage serves as a dependent measure. Although the hypothesized negative effects of incarceration on marriage have received attention in the literature, no longitudinal studies of marriage and incarceration have been conducted to date. Second, the model includes a number of control variables, particularly military participation, that have not been included in previous research. Inclusion of multiple controls increases the explanatory power of the models and reduces the possibility of selection bias. It is important to consider non-random selection of individuals into incarceration. Men who have been involved in crime often have limited social and economic capital. These deficiencies can render an individual less desirable in the marriage market and can affect future employment opportunities, regardless of incarceration experience (see Gottfredson & Hirschi, 1990).

Finally, the sample selected for analyses is broader than has been used in past research. The scope of previous work has been diminished because researchers have limited their analysis to sub samples of the population. For example, research on earnings has largely ignored unemployed individuals (Western, 2002) and most research on marriage has been limited to men with children (see Hagan & Dinovitzer, 1999). Unlike other research, this study uses data from the National Longitudinal Survey of Youth (NLSY), a prospective survey of a cohort of American youth, to examine the effect of incarceration on full-time employment and marriage. Specifically, it is hypothesized that men who have been incarcerated are significantly less likely to become married and gain full-time employment.

Incarceration as a Lifecourse Event

The life-course perspective is particularly relevant to the study of incarceration. Incarceration is associated with a class of general social events, like marriage and illness, that have been linked with trajectory change. Incarceration is thought to reduce opportunities for marriage and employment in two primary ways. First, the stigma associated with imprisonment significantly affects one's chances of finding and maintaining a job and establishing relationships. Incarceration often elicits strong feelings of shame and anger for the family and associates of inmates (Braman, 2002; Hagan & Dinovitzer, 1999). This stigma can reduce the pool of marriageable partners and increases the probability that a marriage will end in divorce. Generally speaking, women are more likely to internalize shame than men; thus, they often shy away from relationships involving incarcerated males or sever relationships once their partner is imprisoned (Braman, 2002). Moreover, women are often reluctant to marry the fathers of their children if he has been incarcerated (Edin, 2000; Edin, Nelson, & Paranal, 2001; Nurse, 2002). In a study of the effect of incarceration on family formation, Edin and colleagues (2001) found that following incarceration, virtually none of the incarcerated fathers were able to maintain contact with their significant others or children.

The effects of stigma on job opportunities have been well established. Studies employing experimental methodologies have confirmed that employers are less likely to hire individuals who report being incarcerated than those who do not report any past convictions (Boshier & Johnson, 1974; Buikhuisen & Dijksterhuis, 1971). In addition, employers are more likely to hire an individual with less job experience than someone who reports being incarcerated (Holzer, 1996). More recently, Pager (2003), using a matched-pair design, found that employers were half as likely to consider a job candidate with a prior conviction, even if the person was equally qualified. The effect was particularly strong for Blacks. Only 5 percent of Blacks with a criminal conviction received a callback, while, 14 percent of Blacks without a conviction, 17 percent of Whites with a conviction, and 34 percent of Whites without a conviction were contacted by a potential employer (Pager, 2003, p. 958).

In addition, incarceration erodes social and human capital. Incarceration impedes an individual's ability to attain work experience, diminishes job skills, and can sever positive connections to employers (Holzer, Raphael, & Stoll, 2003). Results from ethnographic studies suggest that men, following incarceration, are more likely to become involved with social groups that devalue employment in the traditional labor market (Hagan, 1993; Sullivan, 1989). As a result, they are less likely to complete their education and often enter secondary labor markets, further reducing opportunities for stable employment. Entrenchment in urban, delinquent subgroups can also reduce one's chances of marrying (Hagan & Coleman, 2001; Hagan & Dinovitzer, 1999; Wilson, 1987). For example, Anderson (1989a, 1989b) found that inner-city Black youth were reluctant to form stable, monogamous unions. In addition, limited access to human

and economic capital made it difficult for men, especially minority men, to be viable players in the marriage market (see Wilson, 1987).

Prior Research

Research on the Effect of Incarceration on Employment

The role of work as a turning point in the life course has been well documented. Researchers have consistently reported a positive association between employment and desistance (Crutchfield & Pitchford, 1997; Mischkowitz, 1994; Sampson & Laub, 1993; Uggen, 1999). For example, Uggen (2000) found that criminal offenders over the age of 26 who were given work following incarceration were significantly less likely to recidivate, even when the employment opportunities were of marginal quality. In the same light, poor employment prospects can also increase the likelihood of criminal involvement. Sampson and Laub (1993) found that subjects with low job stability in late adolescence and early adulthood were four times more likely to be arrested in adulthood.

Incarceration can impede employment opportunities, especially for adolescents (see Western et al., 2001 for a review). Researchers, using data from the National Longitudinal Survey of Youth (NLSY), have found that youthful incarceration has significant, long-term effects on earnings (Fagan & Freeman, 1999; Freeman, 1991; Western & Beckett, 1999). For example, Western and Beckett (1999) found that the employment status of individuals incarcerated as youth was still compromised 15 years after release. In fact, the effect of incarceration far exceeded that for dropping out of high school, living in an area with high unemployment, and adult incarceration (Western and Beckett, 1999, p. 1048).

The relationship between adult incarceration and employment outcomes is less clear. Current research suggests that adult incarceration may affect employment rates in the short term but has little effect on long-term opportunities (Kling, 1999; Needels, 1996; Western & Beckett, 1999). Western and Beckett (1999) discovered that adult incarceration had strong negative effects on employment, but the effect diminished after 3 or 4 years. In contrast, Waldfogel (1994), using data on federal larceny and fraud offenders, found that employment rates were lowered by at least 5 percent for individuals who had been imprisoned. A number of researchers have also linked adult imprisonment to reduced earnings potential (Grogger, 1995; Kling, 1999). Kling (1999) estimated that each year of incarceration reduced total earnings by approximately 12 percent over an eight-year period. In addition, Western (2002) found that incarceration reduced both initial wages and the rate of wage growth over the fifteen year study period. In fact, incarceration reduced wage growth for incarcerated men by approximately one third.

Research on the Effect of Incarceration on Marriage

Like work, marriage has also been linked with desistance (Farrington & West, 1995; Horney, Osgood, & Marshall, 1995; Laub, Nagin, & Sampson, 1998; Ouimet

& Le Blanc, 1996; Sampson & Laub, 1993; Warr, 1998). For example, Sampson and Laub (1993) found that for married members of the sample, attachment to a spouse assumed greater relative importance than job stability in explaining adult crime (see also Laub et al., 1998). In addition, Horney et al. (1995) discovered that moving in with one's spouse decreased offending rates by nearly one half. It is important to note that the observed relationships between marriage and desistance were not instantaneous. Instead, the influence of marriage is gradual over time (Laub et al., 1998). The timing and nature of marriage is also important. Marriage during adolescence and early adulthood has been associated with increases in deviance, while marriage after age 21 acts as a force toward desistance (Ouimet and Le Blanc, 1996).

The effect of incarceration on the development of marital bonds has received only sparse attention in the literature. Initial research suggests that that incarceration erodes social ties to one's spouse (Goeke, 1980; Schafer, 1994). Unfortunately, the scope of this research is severely limited because most of the work is qualitative in nature and based on interviews with very small samples. More recently, researchers have examined the relationship between incarceration, parenthood, and marriage. In a study of couples with newborn children, Western et al. (2004) found that couples were 40 percent less likely to become married within a year of the birth of their child if the father had been incarcerated. It is clear that incarceration erodes social relationships to marriage, but further quantitative inquiry is needed to separate the effect of imprisonment from other correlates (e.g., education) that may confound the incarceration effect.

Methodology

Data

A sub-sample of data from the National Longitudinal Survey of Youth 1979 (NLSY) is used for this research. The NLSY is a prospective survey of a cohort of American youth who were between the ages of 14 and 22 in 1979 (Center for Human Resource Research, 2001). Data have been collected yearly from 1979 to 1994, and biannually from 1996 to 2000 for 19 survey periods.[1] To study change in marital and employment experiences over time, a sample of adult men were followed from 1983 to 2000. Analysis began with 1983 data because this was the first year in which all respondents were over the age of 18, and 2000 represents the most recent year for which public data are available. Data were collected at

1. An appropriate level of sample retention was maintained throughout the study. A retention rate of nearly 90% was sustained for the first 16 waves of the survey. The retention rate dropped to 86% in 1996 and 80% in 2000. Excluding those individuals who have been dropped from the sample, respondents have completed, on average, 17.4 of the 19 interviews. In 2000, 64% of the sample had completed a survey in each of the data collection years (Center for Human Resource Research, 2001).

15 points, and respondents were between the ages of 35 and 43 in 2000. In total, the data capture nearly two decades of adult marital, employment, and incarceration experiences.

The study sample was selected in three phases. The original sample included 12,686 respondents, 6,403 men, and 6,283 women. First, women were omitted because their small numbers precluded meaningful analysis. Women comprise half of the total NLSY sample; however, only 1 percent had been incarcerated at some point during the study period. Current research on marriage also suggests that women may experience marriage differently than men (Goldstein & Kenney, 2001); therefore, the inclusion of women in the study sample may have confounded the incarceration effect. In addition, 1,369 men were removed due to modifications to the original study protocol.[2] Lastly, 443 men were omitted because of interview non-response, extended stays of incarceration, or death.[3] A total of 4,591 men remained after sample selection, of which 464 (10 percent) had been incarcerated at some point from 1983 to 2000.

Measurement of Variables

Dependent Variables

Employment and marriage serve as dependent variables. The *employment* measure is a dichotomous variable where 1 = working full-time (more than 1,900 hours a year) during time *t* and 0 = part-time employment or unemployed during time *t*. The *marriage* dependent variable was dichotomized into individuals who indicated that they were married during time *t* and those that were single, divorced, or widowed (1 = married, 0 = single, married, divorced, or widowed). Descriptive statistics are presented for the total sample and by incarceration status in Table 1 and a description of variables is presented in Appendix A.

As hypothesized, incarcerated men were less likely to be married and employed full-time. In total, 49 percent of the incarcerated sample was married at some point during the study period and 81 percent indicated that they had been employed full-time. In contrast, 77 percent of non-incarcerated males had been married and 95 percent reported full-time employment at one point from 1983–2000. The incidence of marriage and employment was also lower among

2. Due to changes in study protocol, two large sub-groups of participants became ineligible for interviews during the course of data collection. As of 1984, 638 male members of the military sample were no longer interviewed. In 1990, 731 males from the non-black, non-Hispanic economically disadvantaged group were excluded from the sample.

3. In total, 230 males died during the course of data collection, 7 men were incarcerated during 11 or more time periods, and 206 men participated in less than six interviews. These men were omitted from the analysis group. Although the nested structure of the HLM model facilitates the valid estimation of models when both the spacing and the number of observations vary by individual, the preceding cases were removed from the analyses due to poor data quality.

Table 1 Descriptive statistics

	Total sample (n = 4,591)		Incarcerated group (n = 464)		Never incarcerated group (n = 4,127)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Dependent measures						
Marriage	.45	.50	.16	.23	.44	.35
Work	.62	.49	.27	.23	.60	.27
Life course events						
Incarcerated	.02	.15	.25	.20	—	—
Prior incarceration	.13	.71	.86	.35	—	—
Marriage (lag)	.42	.49	.17	.24	.46	.36
Work (lag)	.58	.49	.29	.24	.64	.27
Military	.05	.21	.01	.06	.05	.16
Age (log)	3.34	.16	1.45	.03	1.45	.03
Demographic influences						
Hispanic	.20	.40	.22	.41	.19	.39
Black	.28	.45	.54	.50	.25	.43
Cognitive ability	39.88	28.89	18.75	17.84	42.26	28.93
Urban	.73	.44	.86	.35	.73	.44
Criminal history						
Youthful incarceration	.04	.19	.19	.39	.02	.14
Contextual predictors						
Family poverty	.22	.42	.42	.49	.20	.40
Family structure	.68	.46	.45	.50	.71	.45

incarcerated men. Incarcerated men were married for an average of 16 percent of the total interview points while the average non-incarcerated man reported being married 44 percent of the time (see Table 1). In the same light, incarcerated men were employed full-time for only 27 percent of the interview periods; men who had not been incarcerated reported being married 60 percent of the time.

Independent Variables

Level 1—Time-varying covariates

Incarceration serves as the primary independent variable in the models. Two separate measures of incarceration are used in the analysis. The *incarcerated* measure is dichotomous and accounts for the contemporaneous effect of incarceration on the respondent's ability to attain employment and become married (1 = incarcerated at time t, 0 = not incarcerated). A binary *previous incarceration* measure was also constructed to estimate the post-release effect of

incarceration on the likelihood of marriage and work (1 = incarcerated between 1983 and time *t*, 0 = not incarcerated).

It is important to note that the NLSY instrument does not include a specific measure of incarceration. Instead, imprisonment was measured by noting the residence of the individual at the time of interview. Men who were interviewed at a correctional facility, either by phone or in person, were defined as incarcerated during that particular year. The NLSY does not capture information on individuals who may have been incarcerated for part of the year but were not imprisoned at the time of the interview. In light of the data collection protocol, the incarceration measures are more likely to capture those individuals who had been incarcerated for longer periods of time (e.g., prison) than those who experienced short stays (e.g., jail).

Figure 1 highlights the annual variation in marriage and employment rates for incarcerated and non-incarcerated men. The rates of marriage and full-time employment for non-incarcerated men increased slowly over the study period with 60 percent of men reporting marriage in 2000 and 77 percent with full-time employment. In contrast, less than one quarter (17 percent) of incarcerated men were married in 2000 and 37 percent were employed full-time. Across the study period, incarcerated men were approximately half as likely to be employed full-time and three times more likely to be single, divorced, or widowed. Clearly, a portion of the variation in marriage and employment rates comes from pre-existing characteristics associated with increased chances of incarceration and reduced opportunities for marriage and employment (e.g., low educational levels). As such, as set of dynamic variables and static controls are included in the model to reduce selection bias. Details on these variables are presented below.

Measures of education, employment, marriage, and military participation are included in the model as time-varying covariates. Researchers have consistently linked stable employment to improved chances of marriage (Teachman, Polonko, & Leigh, 1987) and marriage to positive employment outcomes (Fagan & Freeman, 1999). To help isolate the long-term effect of marriage and employment on the dependent outcomes, lagged functions of these variables are included in the model. The *marriage* and *work* exogenous variables are dichotomous and queried individuals if they were married or employed full-time at *t*-1 (1 = married; employed full-time (more than 1,900 hours a year); 0 = not married; employed part time or unemployed).

Education has also been associated with increased chances of marriage and employment. In addition, less educated men, especially minority males, are at greater risk of incarceration (Arum & Beattie, 1999). In fact, one third of Black

1. For the purposes of the graph, respondents are dichotomized into incarcerated and non-incarcerated groups. Men who were incarcerated at one or more points from 1983 were classified as incarcerated (*n* = 464).

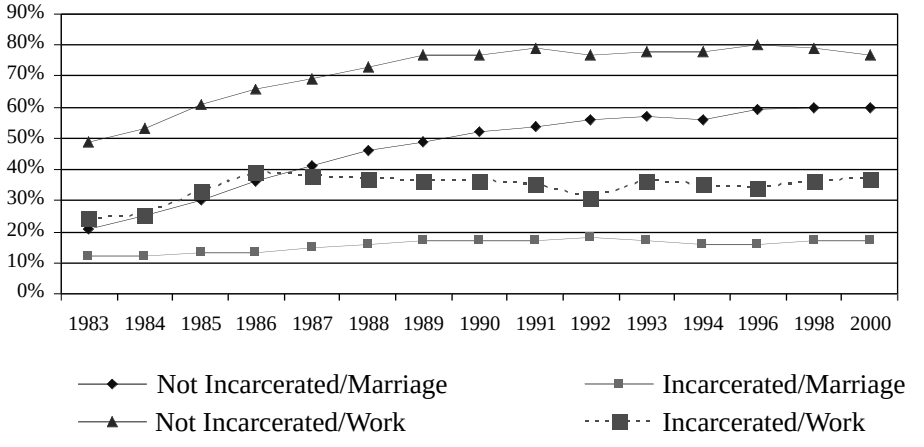

Figure 1 Annual rate of marriage and full-time employment by incarceration status, NLSY males, 1983–2000[1].

men under the age of 35 who had not entered college have been imprisoned at some point (Pettit & Western, 2001). The *education* measure was designed to account for the concurrent effect of education on the dependent measures and represents the number of years of schooling completed at time *t*.

The relationship between military participation, employment, and marriage is less clear. Sampson and Laub (1996) found that men who participated in military service were more likely to develop strong marital bonds, but very little research in this area has been conducted. Military participation is included in the employment model as a control for workforce absence. Most enlisted men were not employed in the mainstream labor market; hence, it is necessary to account for their absence. In the current study, *military participation* is a dichotomous variable (1 = enlisted in the military at time *t*, 0 = not enlisted).

Level 2—Individual, static controls

Consistent with previous research, a number of individual-level demographic characteristics are included in the model as statistical controls. Youthful incarceration serves as a central control in the model. Incarceration during late adolescence and early adulthood has been associated with diminished opportunities for employment (see Western & Beckett, 1999); therefore, it is important to isolate the effect of adult incarceration from that of youthful imprisonment. Although very little research has examined the effect of youthful incarceration on adult marriage opportunities, Nurse (2002) found that youthful incarceration caused significant strain between the youth and their wives or girlfriends. In the current study, the *youthful incarceration* measure

is dichotomous and queried individuals if they had been incarcerated at any point prior to 1983 (1 = yes, 0 = no).[4]

Family context is also an important correlate of marriage, work, and incarceration. Youth who grow up in two parent families and have higher economic means are less likely to be involved in delinquency (Sampson & Laub, 1993) and more apt to become married (Axinn & Thornton, 1992) and employed (Caspi, Wright, Moffitt, & Silva, 1998). Two measures of family context including family poverty and two-parent family are included in the model. The *family poverty* measure was constructed using either the total family income reported by the parent or guardian in the home in which the respondent was living or the total income reported by the respondent if he was living apart from the family. A dichotomous measure of family poverty is used in the current analysis (1 = under poverty level, 0 = above or at poverty line). A binary indicator of childhood *family structure* is also included to test if men who lived with both biological parents during adolescence are more likely to be married and employed in adulthood (1 = lived with both biological parents at age 14, 0 = lived with one biological parent, a step-parent, other family member, foster family, or other family context at age 14).

Consistent with prior research, measures of cognitive ability, residence in an urban area, race, and ethnicity are also included in the models to control for non-random selection into incarceration. Race and ethnicity are important correlates because minority males are significantly more likely to be incarcerated when compared to White males. Based on current estimates, 29 percent of Black males and 16 percent of Hispanic males will be incarcerated at some point during their lifetime, whereas less than five percent (4.4 percent) of White males can expect to be imprisoned (Bonczar & Beck, 1997). In addition, Black men are less likely to become employed following incarceration when compared with White men (Western, Pettit, & Guetzkow, 2002), and Black men also marry at a lower rate than White men (Popenoe & Dafoe Whitehead, 2003). Less is known about the effect of incarceration on marriage and work for Hispanics, although initial research suggests that Hispanics marry at higher rates than Blacks (South, 1993) and are less likely to be employed than Whites (Western, 2002). Two dichotomous measures of race and ethnicity are included to the model (1 = Black, Hispanic, 0 = White or other race).

Finally, both cognitive ability and region of residence have been linked with differential opportunities for marriage and employment. Individuals living in rural areas are more likely to be married (Waite & Spitze, 1981), and urban residence has been associated with diminished employment opportunities, especially for minority men (see Sullivan, 1989). U*rban area* is included as a binary control measure (1 = urban residence, 0 = rural or suburban residence). The

4. This measure includes men incarcerated as young adults and juveniles. In total, 166 men reported being incarcerated prior to 1980. Of those, 104 (63%) were between the ages of 19 and 23 in 1980. Respondents were not asked to provide a date for their most recent incarceration; therefore, it is impossible to ascertain the true age at first incarceration. This measure simply serves as a control for incarceration that occurred prior to the study period.

association between cognitive ability, delinquency, and adult social outcomes is less clear, but cognitive ability has been associated with differential treatment in school settings and lower educational achievement (Menard & Morse, 1984). Therefore, it is important to control for cognitive ability because it could confound the relationship between education, marriage, and employment. In the current study, *cognitive ability* is assessed using percentile scores from the Armed Forces Qualifications Test (AFQT).[5]

Analyses

Hierarchical Linear Modeling (HLM) is used in the current study to estimate the effect that changes in life circumstances (e.g., incarceration, employment) have on the likelihood of marriage (or work) while simultaneously controlling for time-variant covariates (e.g., military participation) and static, individual controls (e.g., race) (Raudenbush & Bryk, 2002). HLM is appropriate for analyses involving repeated-measures data because it allows data from each interview point to be nested within persons while modeling individual variation in the odds of marriage or employment. A general representation of the equations used to estimate the models is presented below. The Bernoulli probability model is employed to account for the dichotomous nature of the dependent measures.

$$\log_n\left[odds\,(Y_{ti}=1)\right] = \pi_{0i} + \pi_{1i}\,\text{age(log)}_i + \pi_{2i}(a_{ti} - a_{\cdot i}) + \ldots + \pi_{7i}\,(a_{ti} - a_{\cdot i}) \qquad (1)$$

where

$$\pi_{0i} = \beta_{00} + \beta_{01}X_1 + \ldots + \beta_{07}X_1 + r_{0i} \qquad (2)$$

$$\pi_{1i} = \beta_{10} + \beta_{11}X_1 + \ldots + \beta_{17}X_1 + r_{1i} \qquad (3)$$

$$\pi_{2i} = \beta_{20} \qquad (4)$$

Growth-curve models are estimated on two levels. The first level (Equation 1) is the within-person model and includes a slope, an intercept, and time-varying covariates. Y_{ti} represents the likelihood of employment or marriage for individual i at time t. The constant for the model is represented by π_{0i} and the slope as π_{1i}. The slope is modeled as a function of the respondent's age and is designed to account for change in the odds of marriage (or work). The log of the respondent's age at each interview point is also used as a dynamic predictor in the

5. The measure of cognitive ability used in this study is not optimal. The AFQT was originally constructed to be an assessment of trainability for the armed forces and is currently used as the primary criterion for enlistment eligibility in the United States armed forces. In addition, the use of standardized scores to measure cognitive ability has also been debated (see Neisser et al., 1996). Due to limitations in the original data-collection instrument, a better measure of cognitive ability was not available.

models. The natural log of age was selected to account for non-linear growth present in the dependent measures and is consistent with trajectories estimated in similar research (Western, 2002).[6]

Time-varying covariates are also included in the Level I model. Consistent with research of this type (see Horney et al., 1995), time-varying covariates were broken into two parts to account for possible bias that may be present because of non-random distribution of error. Time-varying covariates are group-mean-centered at Level I, and individual means of the Level I covariates are included at Level II as predictors of the slope.[7] This technique allows for an accurate estimation of within-person change by separating the effect of change in incarceration status on the odds of marriage (or work) from average differences in rates of imprisonment while controlling for time-varying and static covariates.

The Level II model (Equations 2–4) estimates individual variation in the base rate of marriage (or work) and the change in the likelihood of over time. In the Level II model, the slope and intercept of the Level I variables are included as outcome variables and static, individual-level measures as predictors. Equation 2 represents the constant in the model and Equation 3 the slope. Both equations include a set of individual-level static predictors and an error term. The error term in Equation 2 represents unexplained variation in the average chances of marriage and employment, and that in Equation 3 accounts for random variation over time. Time varying covariates are represented in Equation 4. The slopes for the time-varying covariates are not allowed to vary across individuals; therefore, an error term is not noted for the covariates. Doing so assumes that the effects of the time-varying covariates do not vary across men.[8] A separate equation is estimated for each of the seven covariates.

6. The appropriateness of the growth trend was considered in a number of ways (see Raudenbush & Bryk, 2002, pp. 176–77). The growth trend was graphed using aggregate data for the entire dataset, data subdivided by incarceration status, and data from a sub-sample of individual growth trajectories. The growth trends and the variation around the mean were also observed. In addition, separate growth measures were constructed (e.g., $\frac{1}{4}$age) and included in the model. The log of age predictor was the best fit for the aggregate and individual trends. To ease interpretation, the log of age was mean-centered.

7. Results from the time-constant effects (group means) for the final HLM model are presented in Appendix B. Traditional HLM methodology suggests that each time-varying covariate be mean-centered and that the group means of the Level I variables be included at Level II. Due to colinearity with the incarceration measure ($p > 0.86$), the group mean of the prior incarceration measure was omitted from Level II. The prior incarceration was group-mean-centered at Level I to reflect within-individual change.

8. Random-coefficient models were estimated for both dependent measures to examine the variability in Level I coefficients (results not shown). Apart from the measure of age, significant variation was not found in any of the time-varying covariates; therefore, each of the life-course event variables was considered fixed in subsequent models. The log of age was allowed to vary in each of the models. This modeling procedure is consistent with traditional HLM methodology (Raudenbush, 2001; Raudenbush & Bryk, 2002).

Results

The multilevel analysis proceeds in two phases. First, a null, random coefficient model is estimated. This model includes only the growth parameter (log of age) and is designed to estimate the size of the variation in the average probability of marriage and work. The significant χ^2 values indicate that there is substantial variation in rates of marriage and employment across men, and the likelihood of marriage and work also varies over time (see Table 2). The reliability coefficients provide an estimate of the amount of variation in the model that is due to error.[9] The reliability coefficients for both outcomes are moderate, further confirming the appropriateness of the models.

Second, the full model is estimated. The purpose of this model is to examine the effect of the time-varying variables on marriage and employment, net of static, individual level controls. The model is estimated at two levels. Level I (within-individual model) includes time-varying covariates and is designed to estimate the effect that within-individual change in life circumstances has on the odds of marriage and employment. Level II (between-individual model) includes static, individual-level controls. Both models are estimated simultaneously, and each effect is adjusted for all other predictors in the model. Coefficients for the time-varying covariates (Level I) are presented in Table 3, and results from the Level II model are displayed in Table 4.

Consistent with the hypotheses presented at the outset of the study, incarceration significantly reduced opportunities for marriage and employment. Incarceration was associated with a 39 percent decrease in marriage and 66 percent decline in employment, net of time-varying and static covariates. The strength of the association is expected because current incarceration restricts opportunities for employment and marriage. More importantly, the relationship between prior incarceration and the dependent measures is less strong but considerable. Prior incarceration reduced the odds of full-time employment by

Table 2 Variance components for random effects—marriage and work models

	Reliability	Variance	χ^2
Marriage			
Intercept	.81	7.331	24,364.22**
Age (log)	.53	446.03	11,787.80**
Work			
Intercept	.78	2.72	21,382.34**
Age (log)	.45	26.83	9,263.94**

***$p < 0.001$ (two-tailed tests).

9. The reliability of the coefficients is calculated as a ratio of the true parameter variance to the total observed parameter variance (see Raudenbush & Bryk, 2002, p. 166). Reliability of (π_{pi}) = Var(π_{pi})/ Var(π_{pi}).

Table 3 Effect of life course event variables on likelihood of attainment of marriage and fulltime employment—final level I model (N = 56,146)

	Marriage			Work		
	Coefficient	*SE*	Odds	Coefficient	*SE*	Odds
Intercept	−1.15***	.27	–	.60***	.14	–
Incarcerated	−.50***	.09	.61	−1.08***	.09	.34
Prior incarceration	−.08†	.05	.92	−.23***	.04	.79
Marriage (lag)	-	–	–	.29***	.03	1.34
Work (lag)	.19***	.03	1.21	–	–	–
Military	.32***	.08	1.38	−1.84***	.09	.16
Education	.08**	.02	1.08	.26***	.02	1.30
Age (log)	.63	.48	–	1.71***	.31	–

Notes. Level I predictors (within-individual parameters) were group-mean-centered. Estimates of the within-individual parameters are presented in Appendix B.
***p < .001; **p < .01; †p < .10 (two-tailed tests).

21 percent and marriage by 8 percent. It is clear from the analyses that incarceration impedes opportunities for employment and marriage in the short- and long term.

Table 4 Effect of individual-level variables on likelihood of marriage and work—final model (N = 4,591)

	Marriage			Work		
	Coefficient	*SE*	Odds	Coefficient	*SE*	Odds
Intercept						
Hispanic	.14	.11	1.15	−.11†	.06	.90
Black	−.54***	.10	.58	.03	.06	1.03
Cognitive ability	.00	.00	1.00	.01***	.00	1.01
Youthful incarceration	−.23	.21	.79	−.68***	.11	.50
Family poverty	−.03	.10	.97	−.20***	.05	.82
Urban	−.26**	.09	.77	−.08†	.05	.92
Family structure	.17*	.08	1.19	.14**	.05	1.15
Slope						
Hispanic	−.22	.41	.80	−.11	.27	.90
Black	−.18	.39	.84	.35	.25	1.42
Cognitive ability	.03***	.01	1.03	.03***	.00	1.03
Youthful incarceration	−1.06	.79	.35	.01	.52	1.01
Family poverty	−.08	.38	.92	.31	.24	1.36
Urban	.75*	.33	2.12	−.36†	.22	.70
Family structure	.45	.33	1.57	−.12	.21	.89

***p <.001; **p <.01; *p <.05; †p <.10 (two-tailed tests).

Education, marriage, and employment were all positively related to the dependent measures. For example, prior full-time employment increased the odds of marriage by 1.21, and the odds of marriage were 34 percent higher for employed men. Similarly, a 1-year increase in educational level was associated with a 30 percent increase in the odds of employment. The effect of education on marriage was less strong. A one-unit increase in education corresponds with an 8 percent increase in the odds of marriage.

Military participation was significantly associated with both dependent measures, although the relationship was positive in the marriage model and negative in the employment model. Military participation increased the odds of marriage by 38 percent, but enlistment in military service was associated with an 86 percent decrease in the odds of employment. In fact, the positive effect of military participation on marriage outweighed that of education and employment. These results are consistent with Sampson and Laub's (1996) finding that military enlistment is a key predictor of marriage. The strong, negative association between employment and military participation is not surprising because most men who were enlisted in the military during an interview year were not employed in the mainstream labor market.

Table 4 presents the results from the Level II model. Contrary to prior research, youthful incarceration did not have a long-term effect on adult employment, but youthful incarceration did reduce the odds of employment by half during early adulthood. Although not statistically significant, the coefficients for youthful incarceration in the marriage model signal a possible negative relationship between the measures. This finding is important because very few studies have examined the long-term effects of youthful incarceration on adult marital outcomes. In addition, the absence of statistical significance for this relationship should be examined with caution. Relatively large standard errors were reported for the youthful incarceration measure because very few men (3.6 percent) were incarcerated prior to the study period. Similar concern should be exercised when generalizing from other Level II coefficients.

Family context was also related to marriage and employment. Living in a two-parent family during adolescence increased the initial odds of marriage by 19 percent and employment by 15 percent. Intact family structure was also associated with increases in the likelihood of marriage over time, although the relationship did not achieve statistical significance. In contrast, men who grew up in poverty were 18 percent less likely to be employed initially, but familial poverty did not affect long-term employment prospects. Family poverty was not significantly related to marriage.

Cognitive ability and urban residence were also significantly related to the dependent outcomes. Higher cognitive abilities were associated with an increased likelihood of marriage and employment during early adulthood. In addition, higher cognitive abilities increased the chances of marriage over time. Despite statistical significance, the effect of cognitive ability on both marriage and employment was very small. In reference to region of residence, men who lived in urban areas were significantly less likely to be married in 1983, but

urban residence was positively and significantly associated with marriage over time. This finding is surprising in that researchers have consistently linked urban residence to lower chances of marriage (Teachman et al., 1987). Further exploration of the growth curves suggests that men who live in urban areas are initially much less likely to be married and that the positive slope represents a dramatic rise in marriage in later years. Based on these findings, further examination of the effect of urban residence on marriage is warranted.

Race and ethnicity did influence marriage and employment outcomes, particularly during early adulthood. Blacks were 42 percent less likely to be married during early adulthood, and the negative slope coefficient for Blacks suggests that the likelihood of marriage continues to decline over the life course. Ethnicity was not significantly related to marriage. The relationship between race, ethnicity, and employment is less clear. Hispanic males were 10 percent less likely to be employed during early adulthood, and the deficit appears to be maintained into adulthood, although the slope coefficient does not achieve statistical significance. A significant relationship was not found between race and work. These findings are not in accord with past research that has linked incarceration to substantial long-term deficits the employment prospects of Black men (Western et al., 2002). This research highlights the importance of studying racial variation in marital and employment outcomes for minority men.

Summary and Discussion

The results from this research confirm that incarceration is an important turning point in the adult life course. As expected, incarceration reduced the odds of marrying and attaining full-time employment by at least one third. In addition, the significant relationships observed between prior incarceration, marriage, and employment highlight the long-term deficits that incarceration can engender. More importantly, the negative impacts of incarceration persist, even after controlling for a host of static and dynamic controls. These findings suggest that dynamic changes in life circumstances in adulthood can outweigh individual differences and adolescent bonds and experiences.

In contrast to recent research, the effect of youthful incarceration on marriage and employment was less strong. Men who had been incarcerated as youth were half as likely to be employed during early adulthood, but youthful incarceration did not further influence the chances of employment over time and was unrelated to marriage. Research of late has downplayed the relationship between adult incarceration experiences and employment outcomes (e.g., Grogger, 1995; Western & Beckett, 1999), but results from the current analysis suggest that incarceration in adulthood can outweigh the effects of imprisonment in late adolescence and early adulthood.

One of the most prominent findings from this study was the significant, positive effect that work had on marriage and vice versa. Consistent with past

research (see Becker, 1973), it appears that obtaining full-time employment increases the social capital of men, further enhancing their position in the marriage market. Marriage also increases social capital (Sampson & Laub, 1993) and has been found to mitigate exposure to delinquent peers (Warr, 1998) making traditional employment more viable. Although the mechanisms linking marriage and employment to the outcomes were not explored in this research, the results further confirm the importance of employment and marriage as turning points in the life course. Even more, this study presents preliminary evidence to suggest that the effect of incarceration may not outweigh that of positive social bonds.

Military participation was also positively associated with marriage, but decreased the chances of employment. As discussed previously, one would expect a strong negative relationship between military participation and work because most military personnel do not participate in the traditional labor market. The strong, positive relationship between military participation and marriage further confirms the conceptualization of military participation as a turning point in the life course (Sampson & Laub, 1996).

Although this study presents intriguing results, several caveats should be noted. First, the marriage and work measures as operationalized do not capture information on the nature and strength of the relationships. Life course researchers have argued that work by itself is not as important as employment that is characterized by stability, commitment, and mutual obligations (Crutchfield & Pitchford, 1997; Sampson & Laub, 1995, p. 146; Uggen, 1999). Similarly, researchers have hypothesized that the quality of the marital bond is more important than the bond itself (Rutter, 1996). Although this is a common limitation in research of this type, it is important to consider the results of the current study in light of this omission. As shown in qualitative research, change takes time and is most often accompanied by psychological and emotional modifications (see Maruna, 2001). Many life-course theorists have failed to consider the slow, socio-emotive transformations that accompany change. Incarceration, marriage, and employment are clearly related, but the mechanisms explaining their relationship are still largely unexplored.

In addition, the individual-level control measures were not optimal. The meaning of the individual-level measures varied because of the nature of the research design. Individuals in the sample were 15–23 at the outset of data collection; therefore, the individual-level predictors represent adolescent conditions for some of the sample but not all. This research also lacks a preadolescent baseline of information on family structure, antisocial behaviors, friendships networks, and demographic factors.

Finally, the precision of the incarceration measures is limited by the NLSY dataset. In the current research, the imprisonment measure largely reflects individuals who had been incarcerated for a longer period. The experiences of subjects who had experienced a short stay of incarceration (e.g., jail) may not be fully captured by these data. Caution should be exercised when generalizing from this study to shorter stays of imprisonment. Future data-collection efforts

should be designed to capture data on both the nature of the incarceration event (e.g., jail v. prison) and the length of stay (e.g., number of days served). Without this information, it is impossible to understand the nature or the "dosage" of the incarceration event.

In summary, adult incarceration can have negative, long-term effects on the chances of employment and marriage. The salience of incarceration was maintained, even after controlling for a host of static and dynamic predictors. In addition, education, marriage, and employment were all strong, positive predictors of the outcome measures. Finally, the importance of considering the effect of military participation was also highlighted. It appears that involvement in social institutions (e.g., military participation, marriage, or work) can ameliorate some of the negative effects of incarceration on subsequent bond development. Future research should continue to examine the interrelationships between social events and social bonds over the life course.

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Appendix A. Description of variables

Variable	Description	Years collected
Outcome variables		
Employment	A dichotomous variable with employment of more than 1,900 hours at time t = 1; 0 = employment of less than 1,900 hours	1983–2000
Marriage	A binary variable with marriage during time t = 1; 0 = single, divorced, or widowed	1983–2000
Dynamic predictors		
Incarceration	A dichotomous variable with incarceration at any point during time t = 1; 0 = not incarcerated	1983–2000
Prior incarceration	A dichotomous variable with incarceration at any point between 1983 and time t = 1; 0 = not incarcerated	1983–2000
Marriage (lag)	A lagged dichotomous variable with employment of more than 1,900 hours at time t – 1 = 1; 0 = employment of less than 1,900 hours	1983–2000
Work (lag)	A lagged binary variable with marriage during time t – 1 = 1; 0 = single, divorced, or widowed.	1983–2000
Military	A dichotomous variable with participation in any branch of the military during time t = 1; 0 = not currently enlisted in military service	1983–2000
Education	Number of years of school completed at time t	1983–2000
Age (log)	The logged function of the respondent's age in years at time t	1983–2000
Static predictors *Demographic influences*		
Black	A dichotomous variable with Black = 1; 0 = White or other race	1983
Hispanic	A dichotomous variable with Hispanic = 1; 0 = White or other race	1983
Cognitive ability	Percentile score on the Armed Forces Qualification (AFQT) Test	1981
Urban	A dichotomous variable with men living in urban areas = 1; 0 = residence in rural area	1983
Criminal history		
Youthful incarceration	A dichotomous variable with incarceration at any point prior to 1983 = 1	1983
Contextual predictors		
Family poverty	A dichotomous variable with family income under the poverty level = 1; 0 = above or at the poverty level	1983
Two-parent family	A dichotomous variable with men who lived with both biological parents at the age of 14 = 1; 0 = residence with one parent, stepparent, relative, foster family or other family situation at age 14	1979

Appendix B.Time constant effects—final model

	Marriage		Work	
	Coefficient	SE	Coefficient	SE
Incarcerated	−.88	.42*	−4.28***	.24
Marriage (lag)	–	–	1.27***	.06
Work (lag)	2.17***	.14	–	–
Military	2.90***	.26	−5.38***	.16
Education	−.03	.02	−.05***	.01

***$p < .001$; *$p < .05$ (two-tailed tests).