

Incarceration and the Formation and Stability of Marital Unions

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Incarceration and the Formation and Stability of Marital Unions

Rising imprisonment rates and declining marriage rates among low-education African Americans motivate an analysis of the effects of incarceration on marriage. An event history analysis of 2,041 unmarried men from the National Longitudinal Survey of Youth suggests that men are unlikely to marry in the years they serve in prison. A separate analysis of 2,762 married men shows that incarceration during marriage significantly increases the risk of divorce or separation. We simulate aggregate marriage rates using estimates from the National Longitudinal Survey of Youth and find that the prevalence of marriage would change little if incarceration rates were reduced.

A striking feature of the decline in U.S. marriage rates over the last 40 years is the low level of marriage among African Americans with little schooling. Marriage rates among low-education Black women shrunk by 50% in the 30 years after 1965. By 2000, fewer than 30% of Black women in the bottom third of the education distribution were married compared to more than 60% of their White counterparts (Ellwood

& Jencks, 2004). Wilson and Neckerman (1986) famously linked low marriage rates among poor urban African Americans to the shortage of "marriageable men." In this thesis, low male employment rates and high rates of imprisonment depleted the supply of suitable marriage partners for Black women in poor urban neighborhoods. Although many studies subsequently examined the effect of men's labor market status on marriage rates (e.g., Blau, Kahn, & Waldfogel, 2000; Lichter, LeClere, & McLaughlin, 1991; McLanahan & Casper, 1995), few examined the effects of incarceration.

In their original analysis, Wilson and Neckerman (1986) suggested that incarceration reduced marriage rates by removing men from poor, urban neighborhoods and from the pool of possible marriage partners. The effects of incarceration on marriage may be even larger than Wilson and Neckerman hypothesized because ex-offenders may remain undesirable marriage partners compared to men who have never served time. Convicted husbands may also be at high risk of divorce because of their time behind bars. From this perspective, the aggregate effect of incarceration on marriage markets is potentially large. The effect extends beyond unmarried inmates to include those who are married and the large pool of ex-inmates whose numbers far exceed the number in prison or jail.

The significance of imprisonment for marriage among minority and low-education couples has acquired new importance with the dramatic growth in the incarceration rate. The fraction of

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the adult population in state or federal prison grew fivefold between 1970 and 2000 (Maguire & Pastore, 2003). By 2002, more than 2 million inmates—more than 90% of them men—were locked up in prison or jail. Most of the growth in incarceration rates was concentrated among low-education and African American men. About 30% of noncollege Black men born in the late 1960s spent time in state or federal prison by their mid-30s (Pettit & Western, 2004). Under these conditions, incarceration may have significantly lowered marriage rates among those whose risk of imprisonment was especially high: young African American men and men with little schooling.

The link between incarceration and marriage has broad demographic and criminological significance. Demographers have observed that declining marriage rates among disadvantaged couples increase the likelihood of nonmarital childbearing and the concomitant risk of poverty for unmarried mothers and their children (Ellwood & Jencks, 2004, review the literature). In this context, the prison boom may be fueling nonmarital birth rates and economic disadvantage among minority, low-education women. In addition, strong stable marriages have been found to provide a pathway out of crime for men with histories of delinquency and adult offending (Laub, Nagin, & Sampson, 1998; Uggen & Wakefield, 2005; Warr, 1998). Accordingly, the crime-reducing effects of incarceration may be offset by reduced marriage rates among ex-inmates.

This article investigates the effect of incarceration on marriage among men using data from the 1979 National Longitudinal Survey of Youth (NLSY79). It improves upon the extant literature in several ways. First, only a few studies have estimated the effects of incarceration on marriage and none have done so using an extensive panel (cf. Western, Lopoo, & McLanahan, 2004; Western & McLanahan, 2000). Our analysis of the NLSY79 studies the effect of incarceration on marriage over a 20-year period, allowing us to investigate not only the immediate effect of incarceration but also the long-term consequences. Second, we test the hypothesis that a reduction in marriageable African American men, because of incarceration, may explain some of the racial differences in marriage in the United States. To the best of our knowledge, this hypothesis as it pertains to incarceration has not been tested in

the past. Third, we simulate the differences in marriage by age 39, the oldest age for men in our data, assuming the observed levels of incarceration in the NLSY79 compared to the marriage rates one might observe without incarceration. This simulation provides some insights into the effect incarceration may have on marriage rates in the United States. Finally, we also move beyond earlier research by distinguishing the effect of incarceration on first marriage from the effect of incarceration on marital dissolution.

WHY MIGHT INCARCERATION AFFECT MARRIAGE?

Few studies link incarceration to marriage. Still, a burgeoning research literature analyzes other “collateral consequences” of imprisonment. This research indicates that ex-inmates face significant obstacles to assuming mainstream social roles (Hagan & Dinovitzer, 1999). Research on collateral consequences suggests three mechanisms that might decrease the likelihood of marriage among men who have served time in prison or jail. Separation from the community reduces the opportunity to form relationships and also contributes to strain among those who are already married. The stigma of prison time may repel potential marriage partners. Finally, ex-inmates experience reduced earnings and employment, placing them at a disadvantage relative to those on the marriage market with better economic prospects.

Incarceration has the immediate effect of removing people from their community, separating unmarried men from the pool of possible partners, and straining relationships among those already married. Students of crime rates refer to the “incapacitating” effect of incarceration, restraining inmates from committing crime in society (Zimring & Hawkins, 1995). Incarceration also incapacitates inmates from the prosocial roles of spouse and parent. Wilson and Neckerman (1986) originally described incarceration’s incapacitation effect on female-headed families, and its implications are reflected in research associating sex ratios with local-area marriage rates (Blau et al., 2000; Lichter, McLaughlin, & Ribar, 2000). At the individual level, the incapacitation effect is expressed in the low likelihood of marriage among incarcerated men.

Besides preventing single men from marrying, incarceration also limits the participation of

married men in their primary relationships. Incarceration separates men geographically and socially. Prisons are often located far from the poor urban communities that supply most of the inmates, so sustaining personal contact can be costly for the partners of incarcerated men. Only 40% of incarcerated fathers report having weekly contact with their families, mostly by mail or phone (Travis, Solomon, & Waul, 2001). Prisoners earn virtually no income and often accumulate child support arrears while locked up. The emotional and financial detachment of incarcerated men helps explain ethnographic reports that partners of incarcerated men often form new relationships (Edin, Nelson, & Paranel, 2004). In short, the incapacitative effect of incarceration is likely to prevent marriage among those who are single and increase the risk of separation among married couples.

Incapacitation describes how incarceration lowers the likelihood of marriage while a man is serving time, but incarceration may negatively affect marriage long after release. Incarceration carries a stigma that marks ex-offenders as dishonest or unreliable. The stigma of incarceration is often seen in labor market studies where employers express a strong preference against hiring ex-offenders (Holzer, 1996). Pager's (2003) audit study finds that employers will call back job applicants with criminal records only a third to half as frequently as identically qualified men without criminal records. There is less evidence that prospective marriage partners are deterred, like employers, by the signal of a criminal conviction, but some field reports are suggestive. Edin (2000), for example, reports that poor women in urban areas avoid men who are involved in crime, even if it is lucrative. The stigma of incarceration might thus repel potential partners among those who are not yet married.

The incarceration of a spouse may also stigmatize family members. As Goffman (1963) observes, stigma is passed on through personal relationships, contaminating intimates and acquaintances. Braman's (2003) fieldwork in Washington, DC, found that symptoms of depression and isolation from family and friends were experienced more by the wives of incarcerated men than the men themselves. By engendering feelings of shame among spouses and other family members, the stigma of incarceration during marriage may increase the risks of divorce or separation even after a man is released from prison.

Finally, incarceration may reduce the likelihood of marriage by diminishing an ex-offender's economic fortunes. Although the economic basis of men's marriage prospects may not be rooted in their comparative advantage over women in the labor market (Becker, 1991), many researchers find that men's transition to marriage is related to their employment status (Ellwood & Jencks, 2004, review the literature). Ex-prisoners have been found to earn less and to be employed at lower rates than comparable men who have not been incarcerated (Freeman, 1992; Kling, 1999; Waldfogel, 1994; Western, Kling, & Weiman, 2001). Ex-offenders also experience a slow rate of wage growth, so their economic standing compared to those who have never been incarcerated declines over time (Nagin & Waldfogel, 1998; Western, 2002). Because the wage gap between ex-inmates and noninmates grows over the life course, incarceration's effect on marriage may also be quite persistent. Under these conditions, a male partner will be unable to contribute adequately to the household finances after release, and his partner may be more inclined to refuse to marry him or to divorce him (if married). Pager's (2003) recent work on the economic effects of a criminal record suggests that discrimination against Black ex-offenders is especially severe. If the economic penalty for incarceration is relatively large for Black men compared to Whites, we would expect that incarceration's effect on marriage, through the mechanism of economic disadvantage, will be relatively large too.

Other processes might also produce an association between incarceration and the likelihood of marriage. Time behind bars may encourage the development of antisocial behaviors or deepen inmates' ties to criminally involved social networks, both of which might make a man a less appealing partner.

Quantitative research reinforces this picture of the corrosive effects of incarceration on marriage. Analysis of data from the Fragile Families and Child Wellbeing Study shows that incarceration is associated with an increased risk of separation among new parents (Western et al., 2004). The Fragile Families data revealed that men with prison or jail records were 37% less likely to be married and 19% less likely to be cohabiting than similar men who had never been incarcerated. The Fragile Families analysis used data at just two points in time, but

Sampson and Laub (1993, p. 170) were able to study the effects of juvenile incarceration on marital attachment over an 8-year period. In a structural equation model, they reported that incarceration before age 17 weakens the social bonds of employment and marriage at ages 17–25.

It is very difficult to separate empirically the causal effect of incarceration through increased crime from the selection effect in which crime-prone men are unlikely to be married regardless of their history of incarceration. Previous research on labor and marriage markets has tried to allow for the selection effect of incarceration by controlling for criminal behavior, using instrumental variables, fitting fixed effects, and stratifying by propensity scores (Kling, 1999; Western, 2002; Western et al., 2004). Our analysis treats criminal behavior largely as a rival explanation that accounts for part of the observed association between incarceration and marriage. Our data analysis thus controls for a variety of measures of criminal involvement to identify the link between incarceration and marriage.

ADDITIONAL DETERMINANTS OF MARRIAGE AND MARITAL DISSOLUTION

The vast literature on marriage formation and marital dissolution offers many alternative explanations correlated with imprisonment, which, if omitted from the analysis, will bias our estimated incarceration effects. This research emphasizing the demographic, economic, and religious sources of marriage and divorce motivates the inclusion of additional control variables, besides criminal involvement, in the estimation of incarceration effects.

Descriptions of heterogeneity in marriage rates have focused on age and racial differences. The probability of first marriage has been found to increase with age until the mid-20s after which the probability begins to fall. This pattern has been found for all racial and ethnic groups, although Hispanics have a higher probability of being married compared to non-Hispanics, with African Americans being the least likely to marry (Bramlett & Mosher, 2002; Sander, 1993). High rates of marriage among Hispanics have been linked to the influence of religion. Individuals who report that religion is very important are more likely to marry at every age as are Catholics and those who report being funda-

mentalist (Bramlett & Mosher; cf. Sander). Low Black marriage rates have been related to geographic region and the poor employment prospects of African American men, particularly those with little education in urban areas. Vital statistics data show regional differences in the probability of first marriage, with the South having higher rates than elsewhere (Goldscheider & Waite, 1986; Martin & Bumpass, 1989). A large number of studies also find that marriage rates are higher in areas where men's employment and wage rates are high, and high earnings and employed men are more likely to marry than others (Ellwood & Jencks, 2004). Similarly, men with higher education levels are also more likely to marry than men with lower levels (Goldscheider & Waite; Sander).

The influence of age, race, ethnicity, religion, and other demographic characteristics can also be seen in research on divorce. Men who marry at a young age are more likely to divorce as are men who marry later in life (Becker, Landes, & Michael, 1977; Booth & Edwards, 1985; Martin & Bumpass, 1989; Thornton & Rodgers, 1987). Nonmarital births have been positively linked to divorce (Morgan & Rindfuss, 1985), whereas a marital birth is negatively related to the probability of divorce, at least in the short term (Waite, Haggstrom, & Kanouse, 1985). Although religion and religiosity increase the probability of first marriage, they are also associated with a reduced likelihood of divorce at all ages (Bramlett & Mosher, 2002). Finally, education level is negatively related to the likelihood of divorce (Martin & Bumpass).

METHOD

Data

Our analysis of the effects of incarceration uses data from the NLSY79, a nationally representative sample composed of 12,686 men and women aged 14–22 in 1979. Respondents were interviewed annually from 1979 to 1994, and then again in 1996, 1998, and 2000. Our data analysis estimates the effects of incarceration on the timing of first marriage and, separately, on marital dissolution, given marriage. The analysis of marriage includes all men who turned 18 in 1979, 1980, 1981, or 1982 (0.5% of NLSY men were married before age 18) and who had nonmissing information on the other covariates used in the analysis. There are 3,017

never-married men who turned 18 from 1979 to 1982, and 2,940 (97.4%) of these men had information on their date of first marriage, whereas 899 (29.7%) had missing information on other covariates. Covariate data were mostly missing for an indicator of nonmarital birth and three selection variables: current drug use, assault, and income from crime. We used an imputation procedure to examine the sensitivity of our results to missing data. The large proportion of missing cases rarely affected the results for the sample of unmarried men in the NLSY, although in a few cases, results obtained from imputed data were stronger than those reported below (results available upon request). Thus, the results we report on first marriage, particularly for African Americans, should be considered conservative.

Excluding those with missing data yields 2,041 men or 20,401 person-year observations. We follow these individuals from the age of 18 until they married, exited the survey, or the survey ended. Of this group, 1,482 (76.1% of the weighted sample) married before censoring and 181 (6.4% of the weighted sample) were incarcerated prior to marriage.

We report results for the full sample, and separately for African Americans, Hispanics, and a residual group that includes mostly Whites. The NLSY79 sample contains 563 African American men. Of these African American men, 327 married (57% of the weighted subsample) while age 18 or older and 84 (14.9% of the weighted subsample) were incarcerated prior to marriage. The NLSY79 also contains 365 Hispanic, non-African Americans of whom 269 (74.5% of the weighted subsample) married during the observation period and 36 (10% of the weighted subsample) were incarcerated prior to marriage. Finally, the sample contains 1,113 White men of whom 886 married (79.5% of the weighted subsample) while in the NLSY panel, and 61 of whom (4.6% of the weighted subsample) were incarcerated while in the NLSY panel.

Following Greenstein (1995), our analysis of marital dissolution studies all men in the NLSY79 who married after the initial survey in 1979 (7.7% of men in the NLSY married prior to the 1979 interview) and who had nonmissing information on the other covariates used in this analysis. The NLSY79 contains 4,047 men who were not married by their survey date in 1979 and who reported marrying at some point during the panel. Of these men, 74 (1.8%) had

divorce dates earlier than their first-marriage date. Of the 3,973 men remaining, 68 (1.7%) had missing incarceration data or a missing date for their marital dissolution, leaving 3,905 men. Of these men, 1,143 (29.2%) had missing data for a covariate; primarily individuals lacked information on a nonmarital birth, a marital birth, or one of the selection variables: drug use, assault, or income from criminal activity.

Again, the large proportion of missing cases is a potential cause for concern. To test the importance of the missing values, we imputed missing values for the missing covariates using ordinary least squares (OLS). Results from the imputed model are qualitatively identical to those we report below and are available upon request.

These selection criteria produce a sample of 2,762 men or 21,681 person-year observations. Of these men, 975 (32.3% of the weighted sample) separated or divorced by the last year under observation and 49 (1.1% of the weighted sample) were incarcerated during marriage.

Measures

Our analysis examines hazard rates of first marriage and marital dissolution. Marriage is indicated by a binary variable that equals 1 in the year a respondent first marries and 0 for all earlier years. Marital dissolution scores 1 in the year a man divorces or separates and 0 otherwise.

Unusual among social survey data sets, the NLSY79 provides detailed demographic information while following survey respondents as they move in and out of institutional settings. We obtain incarceration data from an item that annually records the respondent's place of residence. Respondents are coded as incarcerated if their residence is recorded as *jail* at the time of the survey interview or if they reported spending time in a correctional facility before 1980. The residence item is our only source of time-varying information about incarceration. It will tend to miss short spells of jail incarceration but will record with certainty spells of prison incarceration that last a year or longer. The Survey of Inmates in State and Federal Correctional Facilities in 1997 shows that less than 4% of prisoners were sentenced to less than a year, so the bias may not affect the results dramatically. Indeed, incarceration rates in the NLSY match prison incarceration rates calculated from surveys of state and federal correctional facilities (Western, 2002).

If short unmeasured terms of incarceration influence marriage and divorce, measurement error will reduce estimates of incarceration effects. Men who serve time but who are missed by the NLSY79 will be counted among the non-incarcerated, reducing the average differences in outcomes between the two groups. At the same time, criminals who commit more serious offenses, such as violent offenses and drug offenses, tend to receive longer sentences. Thus, we are more likely to find incarceration spells for men who commit serious offenses in the NLSY79 biasing our estimate toward the effect for felony violent and drug offenders.

In both analyses, we use a time-varying indicator variable, called *Currently incarcerated*, that equals 1 if the respondent is currently imprisoned and 0 otherwise. *Currently incarcerated* captures the incapacitation effect of imprisonment. The second variable, *Ever incarcerated*, equals 1 in every year following the first incarceration and 0 otherwise. For individuals incarcerated before age 18 in the marriage analysis, *Ever incarcerated* is set to 1 for the entire event history. This variable should capture any long-term effects of having a prison record. In addition to these incarceration measures, the analysis of marital dissolution includes a measure, *Incarcerated before marriage*, indicating those serving time in a correctional facility before marriage.

In addition to these measures we also use indicators for African American, Hispanic, and White. These categories are mutually exclusive. We also have time-invariant indicators for Catholics (reported in 1979) and whether the individual attended religious services more than twice a month in 1979. We use census region indicator variables that vary over time and an indicator for a nonmarital birth that varies as well. We include a time-varying continuous measure of the highest grade of school completed and another called *Weeks worked last year* that, as the name implies, is a count of the number of weeks worked in the previous year.

To reduce bias in the incarceration effects, we control for three measures of criminal behavior or selection variables. First, we add a time-varying indicator for men who reported recently using marijuana, cocaine, or other illegal drugs. The drug-abuse variables in the NLSY79 were asked in 1984, 1988, 1992, 1994, and 1998. We interpolated for missing years. Second, we include a time-invariant

indicator for men who reported receiving income from illegal activities in 1980. Finally, we added a time-invariant variable for men reporting that they had attacked someone prior to 1980 with the intention of hurting or killing that person. Collectively, these variables should reduce bias in the incarceration measures because of the man's drug use, criminal involvement, and violence.

Finally, we use a series of age indicators in the marriage analysis to capture duration dependence. In the divorce analysis, we use a series of indicators for the length (in years) of the marriage, but we also use a time-invariant measure of the age when first married. The only other distinction between the two analyses is that the divorce analysis includes a time-varying indicator for a marital birth.

Discrete-Time Event History Models

Marriage analysis. We estimate the relationship between the hazard rate of men's first marriage and incarceration for respondent i at age t using the following discrete-time event history model:

$$\ln(P_{it}/(1 - P_{it})) = \beta_{0t} + \beta_1' \mathbf{I}_{it} + \beta_2' \mathbf{X}_i + \beta_3' \mathbf{Z}_{it}, \quad (1)$$

where P is the probability of first marriage given that the individual has not married prior to t , β_0 is the hazard rate for the baseline group, \mathbf{I}_{it} is a vector of incarceration variables, \mathbf{X}_i is a vector of time-invariant background characteristics, and \mathbf{Z}_{it} is a vector of time-varying background characteristics. We estimate this model using the entire NLSY79 sample, called the full sample, as well as separately for African Americans, Hispanics, and Whites.

In addition to estimating Equation 1, we also test the hypothesis that incarceration increases the race gap in marriage rates. We re-estimate Equation 1 excluding the incarceration variables, \mathbf{I}_{it} , comparing the changes in the effects of race and ethnicity with and without the incarceration measures. We expect that a large fraction of the Black-White gap in marriage rates can be attributed to the effects of incarceration.

Finally, we also use the estimates of Equation 1 to simulate by racial group the marriage rates one would observe in the NLSY79 under different levels of incarceration. First, we predict the proportion of men in the NLSY79 who marry by age 39, assuming the incarceration histories

observed in the NLSY79. Next, we assume that none of the men in the sample was incarcerated. By comparing the marriage rates using incarceration rates observed in the data to marriage rates one might observe in a world with zero incarceration, we attempt to determine how much incarceration affects aggregate marriage rates.

Marital dissolution analysis. We also estimate the effect of an incarceration spell on the hazard rate of marital dissolution for married couple *i* in the *t*th year of marriage using the following discrete-time event history model:

$$\ln(Q_{it}/(1 - Q_{it})) = \gamma_{0t} + \gamma_1' \mathbf{I}_{it} + \gamma_2' \mathbf{W}_i + \gamma_3' \mathbf{Y}_{it}, \quad (2)$$

where *Q* represents the hazard rate of marital dissolution, γ_0 represents the hazard rate for the baseline group, \mathbf{I}_{it} is a vector of incarceration measures (including incarcerated before marriage), \mathbf{W}_i is a vector of time-invariant measures, and \mathbf{Y}_{it} is a vector of time-invariant background characteristics.

Unlike the marriage analysis where we had a reasonably large number of men incarcerated even within racial/ethnic subsamples, incarceration is rare among married men. Subdividing the sample used to estimate the hazard rate of divorce by racial/ethnic group produces subsamples with only a handful of men incarcerated in some instances. The lack of variability in the outcome within racial/ethnic subgroups precludes analysis by race and ethnicity.

RESULTS

We report descriptive statistics for men at risk of marriage by their eventual incarceration status in Table 1. Men who were never incarcerated while at risk of marriage were much more likely to marry than men who were incarcerated, 78% versus 52%. We also see great disparities in race and ethnicity by incarceration status: Among the incarcerated, 32% are African American and 10% are Hispanic compared to 12% and 6% for those never incarcerated. We also see a large difference in educational attainment. Incarcerated men average 2.5 fewer years of education than men who have never been behind bars. These statistics also show large discrepancies in “risky” behaviors. Among men who were incarcerated, over three in five had a child before marrying, whereas fewer than

TABLE 1. MEN’S REPORTS OF MARITAL STATUS, DEMOGRAPHIC CHARACTERISTICS, AND INVOLVEMENT IN CRIME AND DRUG USE: UNMARRIED SAMPLE

	Incarcerated (<i>n</i> = 181)		Never Incarcerated (<i>n</i> = 1,860)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Married	.52	.50	.78	.42
African American	.32	.47	.12	.33
Hispanic	.10	.31	.06	.24
Highest grade completed (years)	10.71	1.65	13.21	2.57
Catholic	.24	.43	.31	.46
Very religious	.31	.47	.51	.50
Nonmarital birth	.61	.49	.19	.39
Recently used drugs	.47	.50	.29	.45
Illegal income, 1980	.47	.50	.23	.42
Attack with intent to hurt or kill	.26	.44	.07	.25
Weeks worked last year	27.23	21.97	42.79	16.61

Note: Data are from NLSY79. Values are weighted by the 1979 sample weight. For time-varying variables, the value for the last year in the survey is reported. All variables are dummies except highest grade completed, which varies from 4 to 20 years of education, and weeks worked last year, which varies from 0 to 52 weeks.

one in five men who were never incarcerated fathered a child outside of marriage. Men who were incarcerated were also more likely to use drugs, to have illegal income, and to have committed assault. Finally, men at risk of marriage and who were never incarcerated worked over 15 weeks more a year on average than men who spent time in prison.

Descriptive statistics for first-married men at risk of marital dissolution are similar to those for unmarried men (Table 2). Among these married men, those who were incarcerated were nearly twice as likely to divorce or separate compared to those who were never incarcerated (59% vs. 32%). The racial and ethnic differences between the formerly imprisoned and those who have never been imprisoned are similar to those reported for the group at risk of marriage. Men involved in the criminal justice system are more likely to have a history of risky behaviors and a poor employment record. Among first-married men, the formerly incarcerated men are more likely to use drugs (29% vs. 18%), to have received illegal income (45% vs. 20%), and to

TABLE 2. MEN'S REPORTS OF MARITAL DISSOLUTION, DEMOGRAPHIC CHARACTERISTICS, AND INVOLVEMENT IN CRIME AND DRUG USE: MARRIED SAMPLE

	Incarcerated (<i>n</i> = 49)		Never Incarcerated (<i>n</i> = 2,713)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Ever separated or divorced	.59	.50	.32	.42
Duration of marriage (years)	7.80	5.05	9.49	5.52
Incarcerated before marriage	.53	.50	.01	.12
Age first married	26.73	5.07	26.11	4.29
African American	.32	.47	.10	.29
Hispanic	.13	.34	.06	.23
Highest grade completed (years)	10.68	1.70	13.53	2.73
Catholic	.14	.43	.31	.46
Very religious	.38	.47	.51	.50
Nonmarital birth	.43	.49	.19	.39
Marital birth	.56	.50	.16	.36
Recently used drugs	.29	.46	.18	.38
Illegal income, 1980	.45	.50	.20	.40
Attack with intent to hurt or kill	.28	.45	.06	.25
Weeks worked last year	14.83	20.78	47.19	12.89

Note. Data are from NLSY79. Values are weighted by the 1979 sample weight. For time-varying variables, the value for the last year in the survey is reported. All variables are dummies except duration of marriage, which varies from 0 to 20 years; age at first marriage, which varies from 17 to 43 years; highest grade completed, which varies from 4 to 20 years of education; and weeks worked last year, which varies from 0 to 52 weeks.

have committed assault (28% vs. 6%). We also see large differences in the number of weeks worked by marital status and incarceration status. Men who are married and have never been incarcerated worked 47.2 weeks per year on average compared to 14.8 weeks for married men who have been incarcerated.

We report estimates from the hazard rate of first-marriage models in Table 3. The first column of results shows race and ethnic differences in marriage controlling for religion and demographic variables. In a given year, the odds of marriage among African American men are only about 40% as high as for Whites. The average White NLSY respondent was about 8.5% likely

to get married in a given year, so the hazard rate of marriage for a Black man with the same characteristics is estimated to be about 3.6%. By contrast, there is no significant difference in the odds of marriage between Hispanics and Whites.

How much of the race gap in marriage can be explained by racial disparities in incarceration? When incarceration is added to the baseline model, we see little change in the Black coefficient that measures the Black-White gap in marriage rates (Table 3, Model 2). Other factors, besides incarceration, largely explain the low rate of marriage among African American men.

Estimates for the effects of incarceration provide uneven support for the hypothesis that involvement in the criminal justice system reduces men's marriage rates. Currently incarcerated men are extremely unlikely to get married. The odds of marriage in a given year are only 17% as high for the currently incarcerated as for others (see Model 2). Although a never-incarcerated man with average scores on predictors has a 7% chance of marriage in a given year, the hazard rate of marriage for a man serving prison time is 1.2%. Despite this strong evidence for the incapacitation effect of marriage, there is little evidence that the incarceration effect persists after release from prison. Although among men who have ever been incarcerated the odds of marriage are 18% lower than for those without prison records, the gap in marriage rates is not statistically significant.

Model 3 of Table 3 adds a time-varying measure of drug use, an indicator for illegal income, and another for self-reported violence. Criminal involvement measured by these variables is correlated with incarceration and may repel potential partners on the marriage market. Current drug use is associated with a significantly lower marriage rate, although respondents receiving illegal income or committing serious assaults before 1980 are no less likely to marry than those who are not serious delinquents. Controlling for drug use and other crime has little influence on the estimated effect of current incarceration. Even controlling for crime, men are extremely unlikely to marry in years they serve time in prison. The crime variables also have little effect on the postrelease effect of incarceration. After accounting for crime, we find no statistically significant difference in the hazard rate of marriage among men who have ever been incarcerated and those who have never been incarcerated.

TABLE 3. ODDS RATIOS FROM DISCRETE-TIME EVENT HISTORY MODEL FOR MEN'S TRANSITION TO FIRST MARRIAGE (N = 2,041 MEN, 20,401 PERSON-YEARS): FULL SAMPLE

	(1)	(2)	(3)	(4)
Currently incarcerated	—	.17*** (-4.90)	.17*** (-4.90)	.22*** (-4.14)
Ever incarcerated	—	.82 (-1.49)	.85 (-1.20)	1.01 (.07)
Black	.37*** (-12.84)	.38*** (-12.60)	.36*** (-12.95)	.39*** (-12.08)
Hispanic	.90 (-1.21)	.89 (-1.31)	.86* (-1.77)	.87 (-1.52)
Recently used drugs	—	—	.66*** (-6.57)	.66*** (-6.60)
Illegal income in 1980	—	—	1.05 (.66)	1.04 (.71)
Aggravated assault by 1980	—	—	1.05 (.47)	1.10 (.88)
Weeks worked last year	—	—	—	1.01*** (8.08)
Constant	.08*** (-5.84)	.09*** (-5.41)	.10*** (-5.07)	.06*** (-6.30)
Log likelihood	-4,972	-4,946	-4,924	-4,889
Estimated hazard rate of first marriage assuming no men ever incarcerated	.07			

Note: Odds ratios are exponentiated logit regression coefficients, e^b . Numbers in parentheses are z statistics, B/SE. Controls (omitted) are age, Catholic, education, nonmarital birth, race/ethnicity, region (Northeast, Midwest, and South), and very religious.

* $p < .05$. ** $p < .01$. *** $p < .001$ (one-tailed).

Finally, Model 4 of Table 3 examines whether the low rate of marriage among incarcerated men results from their relatively low status in the labor market. Both the employment measure and the drug use variables are statistically significant in this model. Controlling for employment slightly reduces the estimated effect of current incarceration, but the effect remains extremely large. If a typical respondent has a 7% chance of marriage in a given year, then chances of marriage for an incarcerated man is about 5.5 points lower.

The results in Table 3 assume that incarceration effects are the same for all race and ethnic groups. Table 4 reports separate results for African American, Hispanic, and White men from the most detailed specification, Model 4, in Table 3. The effects of current incarceration are largest among White men. The estimated odds ratio of .12 indicates that serving prison time reduces the hazard rate of first marriage for White men from 10% to 1%. The effects of current incarceration for African American and Hispanic men are smaller but still statistically significant ($p < .05$, one-tailed test). If the baseline hazard rate of marriage for a nonincarcerated Hispanic man is 10%, those in prison are estimated to have just a 2% chance of marriage in a given year, still a substantively large effect. Incarceration is not such a large impediment to marriage among African American

men. Given a baseline hazard rate of marriage of 6%, the annual hazard rate of marriage for an incarcerated Black man is estimated to be 2.6%. Although there is a statistically significant relationship between current incarceration and marriage, there is little evidence for a postrelease effect of incarceration. In all three race and ethnic groups, men who have ever been incarcerated are just as likely to marry as other men, once criminal involvement, demographic, and economic characteristics are controlled.

Although we only found evidence that incarceration reduces the chances of marriage while men are actually serving time, are these effects large enough to significantly alter aggregate marriage rates? We examine the aggregate effects of incarceration on marriage by using the regression results in Table 4 to estimate the number of NLSY respondents getting married by age 39, assuming the observed level of incarceration. We compare this marriage rate to another that assumes that none of the NLSY respondents are ever incarcerated. (Computational details for marriage rates under the observed- and zero-incarceration scenarios are reported in the Appendix.)

Table 5 reports the predicted proportions married by age 39 under both scenarios for African American men, Hispanic men, and White men. The first column suggests that two thirds of all African American men would have

TABLE 4. ODDS RATIOS FROM DISCRETE-TIME EVENT HISTORY MODEL FOR MEN'S TRANSITION TO FIRST MARRIAGE USING MODEL 4 SPECIFICATION

	African American (n = 6,536)	Hispanic (n = 3,472)	White (n = 10,393)
Currently incarcerated	.42* (-1.81)	.17* (-1.74)	.12*** (-2.96)
Ever incarcerated	.86 (.59)	1.12 (.41)	1.13 (.63)
Recently used drugs	.66*** (-3.01)	.78* (-1.70)	.61*** (-6.06)
Illegal income in 1980	.88 (-.95)	1.22 (1.23)	1.05 (.54)
Aggravated assault by 1980	.97 (-.14)	1.13 (0.48)	.99 (-.08)
Weeks worked last year	1.02*** (4.84)	1.02*** (4.05)	1.01*** (5.12)
Constant	.00*** (-9.06)	.01*** (-4.06)	.11*** (-3.61)
Log likelihood	-1,172	-876	-2,780
Estimated hazard rate of first marriage assuming no men ever incarcerated	.06	.10	.10

Note: Odds ratios are exponentiated logit regression coefficients, e^b. Numbers in parentheses are z statistics, B/SE. Controls (omitted) are age, Catholic, education, nonmarital birth, race/ethnicity, region (Northeast, Midwest, and South), and very religious.

*p < .05. **p < .01. ***p < .001 (one-tailed).

been married by age 39, assuming the incarceration rates in the NLSY79. The second column shows that if no one had been incarcerated, the proportion marrying by age 39 increases to 67.6%. In the final column, we report the difference in the probability of marriage by age 39. For African American men, we predict that reducing the incarceration rate to zero between 1979 and 2000 would increase the prevalence of marriage by just 1 percentage point. This change is not statistically different from zero suggesting that incarceration is not appreciably reducing aggregate marriage rates, at least among the NLSY cohort.

Both Hispanics and Whites have much higher probabilities of marriage than do Blacks by age 39. Among Hispanics, we predict that 82.2% would marry, and among Whites, we predict

that 87.6% would marry by age 39, assuming the incarceration rates reported in the NLSY. Our simulation suggests that marriage rates may be higher for both groups if these men had not been incarcerated, but the differences are small and statistically insignificant. These results indicate that the individual-level effect of incarceration on those in prison is large, but the aggregate effect is small. Those at risk of imprisonment are extremely unlikely to marry, even in the absence of incarceration.

In the analysis of marital dissolution, only 49 (1.8%) out of a sample of 2,762 men are incarcerated while married. In this case, we report only results from the full sample that pools Whites, African Americans, and Hispanics (Table 6). Model 1 shows that men incarcerated before marriage are not more likely than others

TABLE 5. ESTIMATED PROPORTION OF NLSY MEN MARRYING BY AGE 39 ASSUMING THE OBSERVED LEVEL OF INCARCERATION, AND ZERO INCARCERATION, BY RACE AND ETHNICITY

Race/Ethnicity	Observed Incarceration (1)		Zero Incarceration (2)		Difference (2) - (1)	
	Proportion Married	SE	Proportion Married	SE	Proportion Married	SE
African Americans (n = 563)	.666	.022	.676	.022	.010	.006
Hispanics (n = 365)	.822	.037	.825	.038	.003	.006
Whites (n = 1,113)	.876	.018	.878	.018	.002	.002

Note: Calculations described in the Appendix.

*p < .05. **p < .01. ***p < .001 (one-tailed).

TABLE 6. ODDS RATIOS FROM DISCRETE-TIME EVENT HISTORY MODEL FOR MEN'S TRANSITION TO DIVORCE (N = 2,762 MEN, 21,681 PERSON-YEARS)

	(1)	(2)	(3)
Incarcerated before marriage	1.10 (.44)	.99 (-.07)	.94 (-.30)
Currently incarcerated	3.61*** (4.37)	3.61*** (4.42)	2.99*** (3.72)
Ever incarcerated	1.80 (1.64)	1.37 (.87)	1.13 (.34)
Recently used drugs	—	1.85*** (8.01)	1.87*** (8.14)
Illegal income in 1980	—	1.09 (1.11)	1.10 (1.15)
Aggravated assault by 1980	—	1.37** (2.68)	1.35* (2.59)
Weeks worked last year	—	—	.99*** (-4.36)
Constant	.01*** (6.25)	.00*** (-7.12)	.00*** (-6.94)
Log likelihood	-3,690	-3,650	-3,641
Estimated hazard rate of divorce assuming no men ever incarcerated	.04		

Note: Odds ratios are exponentiated logit regression coefficients, e^{β} . Numbers in parentheses are z statistics, B/SE. Controls (omitted) are age first married, Catholic, duration of marriage, education, nonmarital birth, marital birth, race/ethnicity, region (Northeast, Midwest, and South), and very religious.

* $p < .05$. ** $p < .01$. *** $p < .001$ (one-tailed).

to get divorced or separated. Incarceration prior to marriage provides a useful control for identifying the causal effect of current incarceration and the postrelease effect. Even taking account of incarceration before marriage, the risk of marital dissolution in the year a man is incarcerated is extremely high. The odds of divorce or separation are multiplied by 3.6 when a man is in prison. The average annual hazard rate for divorce is 4% among men who have not been incarcerated; incarceration is estimated to raise this risk to 13%. Although the coefficient is reasonably large, the effect of ever incarcerated is not statistically significant, indicating that men who go to prison while married are not at greater risk of marital dissolution after release.

Model 2 adds controls for drug use, criminal activity, and violence. In this model, again, the coefficients for incarcerated before marriage and ever incarcerated are statistically insignificant. The coefficient for currently incarcerated remains unchanged and statistically significant with the addition of these factors. Among the selection measures, both the coefficient for drug abuse and the aggravated assault measure are statistically significant. These coefficient estimates suggest that men who abuse drugs and have a history of violence are at greater risk of divorce.

Finally, Model 3 adds a measure for employment. Among the incarceration measures only currently incarcerated is significant. The low

rate of employment among men serving prison time explains approximately one sixth of the effect of current incarceration. Still, the effect remains substantively very large. Given a baseline annual hazard rate of divorce or separation of 4% for men who were never incarcerated, men in prison are estimated to have a hazard rate of 11%, even after employment is controlled.

DISCUSSION

Many researchers have observed that low marriage rates among disadvantaged African American men are related to declining employment opportunities in low-skill urban labor markets. Over the last 20 years, Black men's life chances have also been affected by the rapid growth in incarceration rates. Just as the decline in urban labor markets may have undermined the marriage markets of minority men and women, the prison boom may also have significantly reduced marriage and contributed to family disruption.

We examined this idea using data from the NLSY79. By recording whether survey respondents were interviewed in a correctional facility, we studied the effects of incarceration on first marriage among single men and on the chances of divorce or separation among those who were married. The data analysis provided strong evidence that men in prison are only about a fifth as likely to marry in a given year

compared to similar men who are not incarcerated. The effects of current incarceration are largest for White men and smaller for African American men whose marriage rates are lower, in any event. Although incarceration sharply reduces men's likelihood of marriage while time is being served, there is little evidence that the effect of incarceration extends after release. Unlike results for the labor market, for example, there appears to be little stigma in a prison record that reduces ex-inmates' marriageability after release (cf. Pager, 2003, and Western, 2002, for postrelease effects of a prison record on the labor market).

Although the contemporaneous effects of incarceration are large, the effects on aggregate marriage rates are very small, potentially reflecting the low marriage rate among the low-education, crime-involved men at highest risk of incarceration as well as the small number of low-education, crime-involved men in the population. To the extent that this result can be generalized to the U.S. population, this analysis offers little support for the idea that the long-standing decline in marriage rates among Black women results from the large increase in incarceration rates among Black men. In short, although incarceration is highly disruptive for an individual's chances of marriage, the effect of incarceration on the prevalence of marriage is very small.

We obtain similar results for the effects of incarceration on divorce and separation. The likelihood that a marriage will fail in the year a man is incarcerated is about three times higher than that for a man who is not incarcerated. This result represents our best estimate of the causal effect of incarceration because we are also able to control for incarceration prior to marriage. Although this individual-level effect of incarceration on marital dissolution is very large, the aggregate effect of incarceration on aggregate rates of divorce and separation is very small because so few men at high risk of incarceration marry. Indeed, fewer than 2% of married men in the NLSY were incarcerated during marriage.

Although these results point to the large but temporary individual-level effects of incarceration and the small aggregate effect, our estimates may overstate the negative effects of incarceration on marriage rates. Although we control for a variety of risky behaviors that are associated with incarceration and that make

men less desirable partners, the estimated effects may be a spurious consequence of behaviors or childhood experiences jointly related to the chances of marriage and incarceration. The analysis of first marriage is particularly vulnerable to the effects of omitted variables correlated with incarceration. The divorce analysis controlled for incarceration prior to marriage, accounting for many behaviors contributing to unstable marriages and a high likelihood of imprisonment during marriage. No such control variables were available in the analysis of first marriage. Still, the significant incarceration effect was extremely stable, when controls for crime and employment were introduced into the analysis. This suggests the addition of other variables highly correlated with drug use and crime are unlikely to change the estimated incarceration effect substantially.

By focusing on the aggregate effects of incarceration in the whole NLSY cohort, we may have also missed the collective influence of the prison boom on high-risk groups. Our interest in the effects of incarceration was motivated by research on the marriage markets of African Americans who resided in the declining urban economies of the Northeast and the Midwest. Because the reach of the criminal justice system is pervasive in these areas, the aggregate effects of incarceration may be larger for disadvantaged, inner city, African Americans. Indeed, analysis of data for poor urban, mostly minority, couples suggests the individual and aggregate effects of incarceration may well be larger for high-incarceration groups than in the U.S. population as a whole (Western et al., 2004).

This research represents just a first step in understanding the links between marriage and incarceration. We have seen that incarceration is highly disruptive reducing the likelihood a man will marry while imprisoned and dramatically elevating the risk of divorce in first marriages. The effects of incarceration do not appear to be persistent, however. Criminologists have found that a strong and long-lasting emotional attachment, and not marriage specifically, helps divert men from crime (Laub, Nagin, & Sampson, 1998; Uggen & Wakefield, 2005; Warr, 1998). From this perspective we still know little about the effects of incarceration on the quality of marital relationships. Research on this question will ultimately shed more light on the consequences of the prison boom for family relationships.

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APPENDIX

In this appendix, we describe our calculation of the cumulative probability of first marriage by age 39.

Let π_t be the proportion of a cohort that married at age t . The proportion of the cohort married by age 39, P_{39} , can be calculated as follows:

$$P_{39} = \sum_{i=18}^{39} \pi_i. \quad (\text{A1})$$

$$\pi_t = p_t(1 - S_t), \quad (\text{A2})$$

where p_t is equal to the hazard rate of first marriage at age t , and S_t is the proportion of the cohort that remains unmarried by age t , that is,

$$S_t = \sum_{i=18}^{t-1} \pi_i. \quad (\text{A3})$$

We assume that the hazard rate of first marriage for individual i at age t can be described as follows:

$$\eta_{it} = \mathbf{X}'_{it}\boldsymbol{\beta}, \quad (\text{A4})$$

where

$$p_{it} = \exp(\eta_{it})/[1 + \exp(\eta_{it})].$$

We estimate Equation 1 (described in the text) to derive estimates of the vector $\boldsymbol{\beta}$. From these estimates we generate \hat{p}_t for all t between 18 and 39, inclusive, by racial/ethnic group. More specifically, we generate \hat{p}_t by calculating the mean of the hazard rate predicted for each individual by setting the t age indicator variable to 1 (and all other age indicators to 0) while leaving the other covariates at their observed values. Next, again by racial/ethnic group, we predict the S_t given the sample sizes for each group in the NLSY. With the estimated hazard for every age and the proportion of the group surviving to each age, we next estimate $\hat{\pi}_t$ for all t . Finally, we can estimate P_{39} as follows:

$$\hat{P}_{39} = \sum_{i=18}^{39} \hat{\pi}_t. \quad (\text{A5})$$

To estimate a standard error for \hat{P}_{39} , we bootstrapped each racial/ethnic group with 1,000 resamples. Because there are few individuals aged 35 and older, we constrained the hazard rate to be constant for ages 35 through 39 when bootstrapping the standard errors.