Choice or Constraint? Mass Incarceration and Fertility Outcomes Among American Men

Bryan L. Sykes

Becky Pettit

Department of Sociology
University of Washington

September 22, 2008

Abstract

The rapid growth of the prison system over the last three decades represents a critical institutional intervention in the lives of American families, which may have far-reaching and unintended consequences for demographic processes. In this paper, we investigate how exposure to the criminal justice system affects micro fertility decisions and aggregate fertility patterns. We propose to examine fertility choice and constraint within a counterfactual framework to assess whether and to what extent institutionalization has restricted and lowered the parity of men, and we theorize about how exogenous institutional factors (the penal system) has altered partnership selection in such a way that accounts for observed changes in non-marital, multi-partnered, and teenage fertility. Our findings may help to explain growing disparities in fertility patterns by race and class.

Choice or Constraint? Mass Incarceration and Fertility Outcomes Among American Men

Introduction

The rapid growth of the prison system over the last three decades represents a critical institutional intervention in the lives of American families, which may have far-reaching and unintended consequences for demographic processes. In this paper, we investigate how exposure to the criminal justice system affects micro fertility decisions and aggregate fertility patterns. We ask whether the expansion of the prison system helps to explain increases in non-marital and multi-partnered fertility during a period of declining teenage fertility.

This question is important for several reasons. First, inequities in the likelihood of incarceration by gender, race, and class compel attention to the importance of the criminal justice system in accounts of demographic changes and persisting inequalities. The massive growth of the penal system is notable not only for its size, but also for its disproportionate effects on minority and low-skill men. There has been considerable attention paid to how inequalities in the criminal justice system affect social, economic, and political inequality (Western and Beckett 1999; Western and Pettit 2000; 2005; Pettit and Western 2004; Uggen and Manza 2002; Behrens, Uggen, and Manza 2003). However, less attention has focused on how the criminal justice system can shape and reproduce race and educational inequalities in fertility outcomes.

Second, focusing on the relationship between incarceration and fertility is critical for understanding inequalities in the likelihood of incarceration across generations. Almost half of all youths in the correctional system have a parent in the adult system (Mumola 2000) and the likelihood of incarceration is 5-6 times greater among children with a parent in prison than children of never-incarcerated parents (Springer et al. 2000). Recent estimates by Wildeman (Forthcoming) indicate that 1 in 5 black children has had a parent in prison (compared to 1 in 40 white children) and just as exposure the criminal justice system is stratified by education, children of high school dropouts are much more likely than children of those with more education to have either a mother or father in prison. These findings confirm an inextricable link between current and future generational incarceration that is highly structured by race and class inequality.

Finally, the institutional confinement of low skilled men and their subsequent reproductive intentions and outcomes may provide answers to long-standing issues in fertility research. For many years, demographers have been unsuccessful in reconciling reproductive intentions with observed period fertility rates. The way in which couples negotiate parity and timing is important for understanding changes in aggregate rates of marital and nonmarital childbearing. While women's desired fertility is often the focus of study, a substantial body of work shows that male fertility desires matter for female parity progressions (Thomson, McDonald, and Bumpass 1990; Thomson 1997; Greene and Biddlecom 2000) in both developing and developed nations (Vikat, Thomson, and Hoem 1999; Isvan 1991; DeRose, Dodoo, and Patil 2002; Bankole 1995; Thomson and Hoem 1998; Thomson, McDonald, and Bumpass 1990). The mass incarceration of undereducated, low skill men may constrain the reproductive opportunities of both men and women; however, it is also possible that, in the absence of incarceration, these men would have chosen to reduce their fertility independent of incapacitation. It is unclear whether individual choice or institutional constraint explains the changing nature of nonmarital, teenage, and multi-partnered fertility. We propose to examine fertility choice and constraint within a counterfactual framework to assess whether and to

what extent institutionalization has restricted and lowered the parity of men, and we theorize about how exogenous institutional factors (the penal system) has altered partnership selection in such a way that accounts for observed changes in non-marital, multi-partnered, and teenage fertility.

Individual Choice or Institutional Constraint

The expansion of the criminal justice system may be a likely culprit for the growth in nonmarital fertility, as well as racial disparities in nonmarital fertility. There are four distinct patterns in the relationship between family formation and crime/incarceration: 1) that marital unions insulate men from engaging in criminal life-styles, thereby reducing their risk of (future) incarceration (Sampson and Laub 1993; King, Massoglia, and Macmillian 2007); 2) that incarceration may affect aggregate marriage rates (Lopoo and Western 2005; Charles and Luoh 2005; Mechoulan 2006); 3) that incarceration lowers the likelihood that a father will cohabit or marry one year after the birth of his child (Western et al. 2004); and 4) that women who have children with men who have been incarcerated are more likely to have additional children with other men (Carlson and Furstenberg 2006). Incarceration is likely to affect marriage both directly through its incapacitative effect and indirectly through economic opportunities (Pager 2003; Pager and Quillian 2005) and social stigma (see, for example, Edin and Kefalas 2005).

Although different in focus, these findings do not illuminate the decision-making process behind whether to contracept, marry, or have children with other partners. Income, sex ratios, gender roles, attitudes and social norms have been used to explain fertility and marriage decisions (South and Lloyd 1992b;a; Lerman 1989). However, research has not paid enough attention to the generalized decoupling of marriage and fertility. In particular, there are no theories that explain the joint effects of differential nonmarital fertility (over time and by race) and the role institutional interventions play in shaping current and future fertility decisions by both partners.

Fertility research routinely explains reproductive outcomes in terms of female choice and constraint, where choice embodies planning and bargaining around sex and reproduction, while constraint highlights factors outside the control of women (the availability of men, infecundity, etc.). Effective contraceptives have allowed women to plan, negotiate, and time their fertility, making reproductive choice the cornerstone of fertility theory. Bargaining around sexual intercourse and reproduction has been shown to explain the rise in nonmarital and teenage fertility since the 1960s. Prior to the introduction of the pill, the promise of marriage, in the event of pregnancy, was a requisite for nonmarital sexual intercourse (Akerlof et al. 1996). However, after the introduction of the pill (and legalized abortion), the cost of sexual intercourse declined and men could obtain sex without the extraction of a marriage promise. The pill was principally important in facilitating this psycho-social change because women could make greater educational and labor market investments without the loss of sexual intercourse or mate selection (Goldin and Katz 2002).

Yet, despite the reduced cost of sexual intercourse with the advent of effective contraceptive methods, few theories have posited explanations for the increase in nonmarital fertility beyond levels associated premarital sex since the contraceptive revolution. In several influential papers (Weiss and Willis 1985; Willis 1987; Willis and Haaga 1996; Willis 1999), Willis and colleagues show that fathers could shift the costs of childrearing onto single mothers if female wages are high and there is an excess of supply of women. The penal system is an active agent in shifting the sex ratio of urban areas in such a way that the number of available women is greater than men. This may mean that the rise in nonmarital childbearing is in part due to exogenous changes in incarceration, suggesting that institutional constraints on some men become externalities for non-incarcerated men and women. The fertility choices of the non-incarcerated population is then a

function of the institutional constraints imposed on incarcerated men.

Toward an Institutional Theory of Incarceration & Non-Marital Fertility

Although utility and bargaining models are largely used to explain the decline in aggregate marital fertility and the rise in nonmarital fertility, the role of institutions in shaping fertility decisions and outcomes for different subpopulations has not been fully incorporated into theoretical models. Since the 1960s, marital fertility has steadily declined as the mean age at first marriage and the fraction of women remaining unmarried has risen. One explanation for the rise in nonmarital fertility is that post-modernity has eroded the gains to marriage. The declining cost to sexual intercourse, an increased division of labor outside the household that provides traditional services of a stay-at-home spouse/partner, and the role of legal institutions to enforce contracts between divorced and unmarried parents for the benefit of children have largely dismantled the gains to marriage because the utility derived from remaining single outweighs the combined utility of both partners if they were to marry (Becker 1993).

We draw on an existing theory of childbearing and remarriage to motivate our theoretical and methodological models. Griffith et al. (1985) argue that having a child serves two purposes: 1) it marks entry into adulthood and 2) it displays commitment to the relationship. In studying fertility patterns of remarried couples, they find that the number of preexisting children brought into the marriage has no effect on the likelihood of having an additional birth within the new partnership. They conclude that the new birth is important in confirming and legitimating the new marriage and step family. These findings have also been observed in other research (Vikat et al. 1999).

In order to understand how incarceration may raise nonmarital fertility, consider two scenarios where the gains to marriage for an unmarried couple does not exist at time t. For simplicity, assume that the unmarried couples have achieved parity k, where $k_t \geq 1$. Scenario **A** exists only for couples where the men have never been incarcerated, as denoted by j. For k_t, men may provide monetary resources for childrearing, and cohabitation or marriage is possible with some probability M. At parity $(k + z)_{t+n}^j$, where n is some continuous change in time and z a discrete increase in parity, the woman may or may not have an additional child with the same partner or she may have a child with a new partner if her initial relationship ended. In this scenario, nonmarital fertility, and possibly multi-partnered fertility, would rise with the birth of a new child. Multi-partnered fertility will increase if the birth of a child to the new partner legitimates the relationship.

How might incarceration raise nonmarital and multi-partnered fertility beyond some general level? It is possible that nonmarital fertility would have risen over time even if some men were not incarcerated because some never and ever incarcerated men share similar characteristics and dispositions other than involvement in the penal system. However, incarceration may redistribute or shift the relative power over negotiating intercourse and reproduction away from men and toward women if incarceration nullifies or mollifies the commitment to the partnership. If this occurs, then the non-incarcerated partner may search for a new partner, which would require a demonstration of commitment. Conception and live birth may be the modal method in which disadvantaged unmarried couples display their commitment. The incarceration of one partner could mean that the other partner may search for and find a new partner. If she were to have an additional child with the new partner, then nonmarital and multi-partnered fertility would rise.[1]

---

[1]This can also be extended to paroled males. Their release would mean that they too would have to find new partners, thereby possibly raising nonmarital and multi-partnered fertility.

To make this more clear, consider scenario **B**, where the male partner is i incarcerated sometime between k_t and $(k+z)_{t+n}$, henceforth referred to as t^*. This is the worst possible state for a mother because cohabitation and marriage are not available options with her current partner. The woman may then terminate her relationship and conduct a new search S, possibly against the wishes of her incarcerated partner. In this scenario, the bargaining power of $i < j$ at t^* because financial support for childrearing and the potential for marriage/cohabitation are less likely with incarceration. As a result, partners of incarcerated men now have an incentive to search for a new partner, S^i, and she may display her commitment to the relationship and new partner through the birth of an additional child, thus reaching $(k+z)^i_{t+n}$.

$$Pr(M^i) \leq Pr(M^j) \Rightarrow Pr(S^i) \geq Pr(S^j) \Rightarrow Pr((k+z)^i_{t+n}) > Pr((k+z)^j_{t+n}) \tag{1}$$

Equation 1, which displays the logic of our theory, could be true, if and only if, two conditions are met: 1) that $Pr(M^i) \leq Pr(M^j)$ and 2) the conditional probability of a partner experiencing incarceration and the relationship ending is greater than the overall probability of a couple terminating their relationship in the presence of other reasons. Research shows that the first condition is valid, for Western et al. (2004) find that incarceration lowers the likelihood of both marriage and cohabitation. There is no evidence to support or refute the second condition. However, theoretically, the second condition could be met if attributes of the incarcerated partner and the new partner are similar. One may expect this to be true if both men are chosen from the same marriage market and social environment (i.e., areas with high crime, incarceration, poverty, unemployment).

To estimate the impact of incarceration on nonmarital fertility, we intend to find the numerical difference between scenarios **A** and **B**. The effect of incarceration on multi-partnered fertility can be estimated in two ways: 1) by finding the parity progression probability conditional on the incarceration of a current partner and the formation of a new partnership; and 2) calculating the difference in search times between the termination of the existing relationship and the formation of a new partnership for couples where one partner has been incarcerated and for couples that never experienced incarceration. The latter method can approximated as $S^* - t^* = n$, where S^* is when the new partner search is complete, t^* is for when the relationship ended due to incarceration or some other reason, and n is a continuous change in time, as noted above.

Data

We use data from the National Longitudinal Survey of Youth (NLSY) to examine the effect of incarceration on nonmarital, multi-partnered, and teenage fertility. The NLSY is a nationally representative sample of 12,686 12-22 year old men and women who were first surveyed in 1979. The respondents were interviewed annually until 1994, when interviewing became biennial. The survey measures respondent transitions from school to work, as well as other life-course events like transitioning to parenthood. The data include detailed questions on educational attainment, income and assets, health, marital and fertility histories, labor force participation, and criminal histories. We intend to exploit the longitudinal nature of these data to assess how incarceration has affected current and completed life-cycle fertility among incarcerated and never-incarcerated men.

Methods

We are interested in understanding whether there are systematic and significant fertility differences between incarcerated and non-incarcerated men. Because incarceration is not randomly distributed across the population, we use propensity-score matching techniques to ensure comparison between individuals who are similar on all other characteristics except their incarceration history. Propensity-score matching turns observational data into experimental data by using observed covariates of a treatment variable in order to estimate a respondent's propensity to be incarcerated. The propensity score is the conditional probability of being incarcerated and can be expressed as

$$P(Incarcerated) = Pr(T_i = 1|X_i) \tag{2}$$

where $T_i = 1$ if the i individual is incarcerated and X_i is a vector of socio-demographic, social background, geographic, health, and labor market covariates that predict incarceration and are potential confounders in the association between incarceration and fertility. The method balances background characteristics of treated and untreated respondents to ensure that any fertility differences between incarcerated and non-incarcerated men are not due to significant differences in observed characteristics (Rosenbaum and Rubin 1983; 1984). Our treatment group includes men who have ever been incarcerated over their life-course. Our use of this method, instead of standard regression models, is necessary for several reasons.

First, by estimating the propensity score, we test for pretreatment differences in social background indicators between the two groups of men. If there are significant differences for any of the covariates then incarceration is not random on that dimension. To rectify this, the propensity score is then balanced by constructing groups of respondents where there are no systematic differences in the pretreatment characteristics, which ensures the randomness of incarceration.

Second, by estimating the propensity score, we reduce the dimensionality of including a great number of covariates into the fertility equation (Rosenbaum and Rubin 1983, 1984). The propensity score captures and summarizes the overall effect of all covariates on the likelihood of ever being incarcerated. This leaves one effect to be estimated in the fertility models: the average effect of being incarcerated on the fertility of respondents with similar propensity scores. Statistically significant fertility differences indicate that incarceration is a causally linked observed fertility outcomes.

Lastly, little is known about the distribution from which incarcerated men are likely to be drawn. While it is possible that this distribution is normal, there is no evidence or literature to suggest normality, particularly along certain social background characteristics. To address this issue and ensure confidence in our inferences about fertility disparities, we augment the propensity score matching method by bootstrapping (or resampling) estimates to create a likelihood distribution from which our standard errors (and confidence intervals) are more robust and representative without making any distributional assumptions.

Matching Method

While a number of different matching methods exist, there is no clear guideline for which method to employ in specific situations. Our data contain limited numbers of incarcerated men, which may present a problem in the use of nearest neighbor or caliper matching methods because of the disparity in the number of treated and untreated cases that would have close neighbors, possibly resulting in poor matches (Bryson et al. 2002). We use a kernel matching algorithm based on the normal distribution to construct matched comparison groups. Kernel matching includes all control

cases in the matching process; however, each untreated case receives a different weight based on the distance of its propensity score from the treated cases' propensity score, with the weight defined as

$$w_{ij} = \frac{G\big(\frac{P(S_j)-P(S_i)}{a_n}\big)}{\sum_j G\big(\frac{(P(S_j)-P(S_i)}{a_n}\big)} \tag{3}$$

where the kernel function G(.) and bandwidth (a_n) transform the distance of the propensity score $P(S)$ of the i-th and j-th cases for the purpose of constructing the weight w_{ij}. As a result, closer control cases receive greater weight in the matching process than cases further away (Heckman, Ichimura, and Todd 1997; Heckman, Ichimura, Smith, and Todd 1998; Morgan and Harding 2006). We restrict all matches to the region of common support.

References

Akerlof, George, Janet Yellen, and Michael Katz. 1996. "An Analysis of Out-of-Wedlock Childbearing in the United States." *The Quarterly Journal of Economics* 111:277–317.

Bankole, Akinrinola. 1995. "Desired Fertility and Fertility Behavior among the Yoruba of Nigeria: A Study of Couple Preferences and Subsequent Fertility." *Population Studies* 49:317–328.

Becker, Gary. 1993. *A Treatise on the Family*. Harvard University Press.

Behrens, Angela, Christopher Uggen, and Jeff Manza. 2003. "Ballot Manipulation and the "Menace of Negro Domination": Racial Threat and Felon Disenfranchisement in the United States, 1850-2002." *The American Journal of Sociology* 109:559–605.

Carlson, Marcia and Frank Furstenberg. 2006. "The Prevalence and Correlates of Multipartnered Fertility Among Urban U.S. Parents." *Journal of Marriage and Family* 68:718–732.

Charles, Kerwin and Ming Luoh. 2005. "Male Incarceration, the Marriage Market, and Female Outcomes." *Unpublished Manuscript* pp. 1–53.

DeRose, Laurie, F. Dodoo, and Vrushali Patil. 2002. "Fertility Desires and Perceptions of Power in Reproductive Conflict in Ghana." *Gender and Society* 16:53–73.

Goldin, Claudia and L. Katz. 2002. "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions." *Journal of Political Economy* 110:730–770.

Greene, Margaret and Anne Biddlecom. 2000. "Absent and Problematic Men: Demographic Accounts of Male Reproduction Roles." *Population and Development Review* 26:81–115.

Griffith, Janet, Helen Koo, and C. Suchindran. 1985. "Childbearing and Family in Remarriage." *Demography* 22:73–88.

Heckman, James, Hidehiko Ichimura, Jeffery Smith, and Petra Todd. 1998. "Characterizing Selection Bias Using Experimental Data." *Econometrica* 66:1017–1098.

Heckman, James, Hidehiko Ichimura, and Petra Todd. 1997. "Matching as an Econometric Evaluation Estimator: Evidence From Evaluating a Job Training Programme." *Review of Economic Studies* 64:605–654.

Isvan, Nilufer. 1991. "Productive and Reproductive Decisions in Turkey: The Role of Domestic Bargaining." *Journal of Marriage and the Family* 53:1057–1070.

King, Ryan, Michael Massoglia, and Ross Macmillian. 2007. "The Context of Marriage and Crime: Gender, the Propensity to Marry, and Offending in Early Adulthood." *Criminology* 45:33–65.

Lerman, Robert. 1989. "Employment Opportunities of Young Men and Family Formation." *American Economic Review* 79:62–66.

Lopoo, Leonard and Bruce Western. 2005. "Incarceration and the Formation and Stability of Marital Unions." *Journal of Marriage and the Family* 67:721–734.

Mechoulan, Stéphane. 2006. "The Impact of Black Male Incarceration on Black Females' Fertility, Schooling, and Employment in the U.S., 1979-2000." *Unpublished paper* .

Morgan, Stephen and David Harding. 2006. "Matching Estimators of Causal Effects: Prospects and Pitfalls in Theory and Practice." *Sociological Methods & Research* 35:3–60.

Mumola, C. 2000. *Bureau of Justice Statistics Bulletin: Incarcerated Parents and Their Children*. Washington, DC: U.S. Department of Justice.

Pager, Devah. 2003. "The Mark of a Criminal Record." *American Journal of Sociology* 108:937–975.

Pager, Devah and Lincoln Quillian. 2005. "Walking the Talk: What Employers Do Versus What They Say." *American Sociological Review* 70:355–380.

Pettit, Becky and Bruce Western. 2004. "Mass Imprisonment and the Life Course: Race and Class Inequality in U.S. Incarceration." *American Sociological Review* 69:151–169.

Rosenbaum, Paul and Donald Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika* 70:41–55.

Rosenbaum, Paul and Donald Rubin. 1984. "Reducing Bias in Observational Studies Using Sub classification on the Propensity Score." *Journal of the American Statistical Association* 79:516–524.

Sampson, Robert and John Laub. 1993. *Crime in the Making: Pathways and Turning Points Through the Life Course*. Cambridge, MA: Harvard University Press.

South, Scott and Kim Lloyd. 1992a. "Marriage Markets and Nonmarital Fertility in the United States." *Demography* 29:247–264.

South, Scott and Kim Lloyd. 1992b. "Marriage Opportunities and Family Formation: Further Implications of Imbalanced Sex Ratios." *Journal of Marriage and the Family* 54:440–451.

Springer, D., C. Lynch, and A. Rubin. 2000. "Effects of a Solution-Focused Mutual Aid Group for Hispanic Children of Incarcerated Parents." *Child and Adolescent Social Work Journal* 17:431–442.

Thomson, Elizabeth. 1997. "Couple Childbearing Desires, Intentions, and Births." *Demography* 34:343–354.

Thomson, Elizabeth and Jan Hoem. 1998. "Couple Childbearing Plans and Births in Sweden." *Demography* 35:315–322.

Thomson, Elizabeth, Elaine McDonald, and Larry Bumpass. 1990. "Fertility Desires and Fertility: Hers, His, and Theirs." *Demography* 27:579–588.

Uggen, Christopher and Jeff Manza. 2002. "Democratic Contraction? Political Consequences of Felon Disenfranchisement in the United States." *American Sociological Review* 67:777–803.

Vikat, Andres, Elizabeth Thomson, and Jan Hoem. 1999. "Stepfamily Fertility in Contemporary Sweden: The Impact of Childbearing Before the Current Union." *Population Studies* 52:211–225.

Weiss, Yoram and Robert Willis. 1985. "Children as Collective Goods and Divorce Settlements." *Journal of Labor Economics* pp. 286–92.

Western, Bruce and Katherine Beckett. 1999. "How Unregulated is the U.S. Labor Market? The Penal System as a Labor Market Institution." *The American Journal of Sociology* 104:1030–1060.

Western, Bruce, Leonard Lopoo, and Sara McLanahan. 2004. "Incarceration and the Bond Between Parents in Fragile Families." In *Imprisoning America: The Social Effects of Mass Incarceration*, edited by Mary Pattillo, David Weiman, and Bruce Western, chapter 2. Russell Sage Foundation.

Western, Bruce and Becky Pettit. 2000. "Incarceration and Racial Inequality in Men's Employment." *Industrial and Labor Relations Review* 54:3–16.

Western, Bruce and Becky Pettit. 2005. "Black-White Wage Inequality, Employment Rates, and Incarceration." *The American Journal of Sociology* 11:553–578.

Wildeman, Christopher. Forthcoming. "Parental Imprisonment, the Prison Boom, and the Concentration of Childhood Disadvantage." *Demography* .

Willis, Robert. 1987. "What Have We Learned from the Economics of the Family?" *American Economic Review* 77:68–81.

Willis, Robert. 1999. "A Theory of Out-of-Wedlock Childbearing." *Journal of the Political Economy* 107:S33–S64.

Willis, Robert and John Haaga. 1996. "Economic Approaches to Understanding Nonmarital Fertility." *Population and Development Review* 22:67–86.