

Title: Understanding the Mechanism Behind the Effects of Maternal Prison and Jail Incarcerations*

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ABSTRACT

This study empirically tests three mechanisms commonly suggested to disadvantage youths whose mothers are incarcerated in prison or jail. An event history analysis of school dropout is conducted on a sample of 8,584 adolescents in a large city created by merging several Illinois state administrative data as well as the Project on Human Development in Chicago Neighborhoods (PHDCN). Findings reveal that adolescent children are at greater risk of school dropout during the year(s) their mothers are incarcerated, but these effects are not observed to last after her release from prison or jail. Children who are removed from maternal guardianship and placed under paternal guardianship or under the guardianship of a non-relative adult are observed to have lower odds of school dropout than children who remain under maternal guardianship after the mother's incarceration. Lastly, stigma associated with maternal incarceration is not found to place adolescent children at greater risk of school dropout even after controlling for school quality.

Keywords: Maternal Incarceration, School Dropout

With rapidly growing female incarceration rates, there have been several attempts to explain how children are affected by having a mother incarcerated in prison or jail. Despite these attempts, however, the lack of appropriate data has hindered many from moving beyond theoretical predictions and providing empirical evidence supporting or disproving certain hypotheses about the effect of maternal incarceration. The task of conducting rigorous empirical research is even more complicated by the many risk factors that are present in the lives of these children besides incarceration such as poverty, parental substance abuse, and living in disadvantaged communities (Johnson and Waldfogel 2002; Myers et al. 1999).

The purpose of this paper is to examine the implications of three commonly suggested mechanisms that prior research has identified as avenues through which maternal incarceration disadvantages children. The first mechanism has to do with the incapacitation effects of incarceration which leads to mother-child separation. Currently, about 62 percent of all female prison inmates are reported to be mothers to minor children and among those 61 percent are reported to have lived with their children prior to incarceration (Glaze and Maruschak 2008). National estimates indicate that the majority of incarcerated mothers who were living with their children prior to incarceration were also providing most of their daily care (Glaze and Maruschak 2008).¹ Aside from the fact that incapacitation prevents mothers from meeting their children's

¹ Approximately 77 % of female inmates in state and federal prisons who were living with their children prior to incarceration report to have provided most of the daily care for their minor children. This is one of the main differences between the maternal and paternal incarceration. Fathers are generally less likely to have lived with their minor children prior to incarceration (42 %), and even among those who lived with their children they are significantly less likely to have provided most of the daily care for them (26 %).

daily needs, it may also diminish the amount of adult supervision or social and educational support which have also been linked to positive child outcomes (Oyserman et al. 2002). In addition, the removal of the mother may cause financial instability since the mother's earnings may still comprise a significant portion of their household income (Glaze and Maruschak 2008, Cho and Lalonde 2008).

Second, it has been widely documented that children of incarcerated mothers are at greater risk of living with a non-parent caregiver or to be in foster care for extended time periods (Hayward and DePanfilis 2007; Glaze and Maruschak 2008). According to national statistics, about 45 percent of children live with their grandparents during maternal incarceration, whereas only 37 percent are living with the other parent (Glaze and Maruschak 2008). At least 4.5 percent of foster children are estimated to be in out of home placement due to parental incarceration, while 11 percent of children whose mothers are incarcerated end up in foster homes or other state care (Hayward and DePanfilis 2007; Glaze and Maruschak 2008). Some even argue that the increase in the female incarceration rate can explain as much as 31 percent of the increase in foster care caseloads between 1985 and 2000 (Swann and Sylvester 2006).

Despite the established link between maternal incarceration and children's placement with non-parent caregivers, evidence examining the effect of such placement is extremely rare. Gaudin and Sutphen (1993) show that non-relative foster care families provide no less quality care, if not better, for children of incarcerated mothers than the care provided by extended family members. However, making generalizations based on this study seems problematic given that it only had 40 children (31 children living with relatives; 9 children in foster care) who were below the age of six in its sample.

Third, the stigmatization resulting from maternal incarceration has been raised as a probable source of childhood depression and isolation (Dallaire 2007). Nesmith and Ruhland (2008) found that children of incarcerated parents demonstrate a strong desire for privacy on the matter because they were keenly aware of the negative stigma attached to the event. They also found that older children (in their sample these were early teenagers) put more effort into keeping their parent's incarceration secret and displayed anxiety about the secret being revealed. However, given the geographic disparities in the occurrence of incarceration, for some children having a parent or relative who has been involved in the criminal justice system may be fairly common, sometimes even normative, with a growth in the "prison culture" (Dallaire 2007). As Petit and Western (2004) find, in some communities, it is more common for young men to go to jail than it is for them to go to college.

Using a large panel data constructed by merging several state administrative datasets and a multi-wave survey sample, this article provides empirical evidence on the above three hypotheses by examining the consequences of maternal incarceration on children's educational attainment (i.e. school dropout). I focus on three central questions. First, does mother-child separation due to incarceration increase the odds of a child dropping out of school? The effect of separation is captured by exploring the immediate effects of incapacitation as well as by examining the effects of varying dosage levels of incarceration. Second, are children more (or less) at risk of school dropout if they are removed from their mother's legal guardianship following her incarceration? And if so, does the type of new guardian make a difference? Third, does the stigma associated with maternal incarceration increase children's odds of dropout controlling for school quality?

INCAPACITATION, CHANGE IN GUARDIANSHIP, AND STIGMATIZATION

Incapacitation effects of incarceration in the study of criminal justice usually refer to the effects of physically restraining one from committing crimes against society at large (Nagin 1998). However, in the context of maternal incarceration, a mother's incapacitation not only influences her own ability to commit crimes, but it also affects her ability to "mother" (Enos 2001). In this study, I examine the effect of a mother's incapacitation on her children's school dropout behavior. The effect of incapacitation is estimated as the difference in the risk of school dropout between the year(s) the mother is held in prison or jail and the years that she is not controlling for all observed mother and child characteristics. To account for heterogeneity across children whose mothers follow different career criminal pathways, I also estimate the effect of incapacitation controlling for the length and frequency of maternal incarceration(s).²

In addition to the effects of incapacitation, a mother's incarceration may affect children especially when it entails a change in their legal custody. Although most children are placed with relatives informally, ethnographic studies reveal that the help of child-welfare authorities are enlisted, which can eventually lead to a loss in maternal custody, when caretakers can no longer control a mother's behavior (Enos 2001; Hanlon et al. 2007). Many states also provide financial incentives for families to obtain legal guardianship over the children and improve permanency in the care-giving arrangement by subsidizing "formal" kinship care (Anderson and Righton

² Given that most female prisoners are rearrested within 3 years of release and that about 40 % of them are reconvicted for their crime (Langan and Levin 2002), a large portion of children are experiencing maternal incarceration multiple times which may be associated with different vulnerabilities than those whose mothers are incarcerated only once.

2001).³ The 1997 enactment of the Adoption and Safe Families Act (ASFA) has also contributed to an increase in terminating the parental rights of incarcerated mothers whose children are placed in foster care (Hanlon et al. 2007; Lee, Genty, and Laver 2005).

The effects of experiencing a change in legal guardianship following a mother's prison or jail incarceration remain unknown. It is not difficult to imagine that there would be great heterogeneity in the effect by the surrounding context. For instance, Johnson and Waldfogel (2002) find that children are increasingly likely to be placed with a non-parent caregiver and particularly likely to be placed in foster care as their number of risk factors rises. Foster care literature suggests that children placed with relatives generally experience greater permanency in the placement but are more likely to live in homes with older unmarried adults who are less educated, in poorer health, and are financially constrained compared to children placed with non-kin foster parents (Lawler 2008). The present study aims to address this question by examining student dropout rates for children who experience a change in guardianship following maternal incarceration. It will also compare differences in outcome by type of new guardian (i.e. father, grandparents, other relatives, and non-kin adult) the child is placed with.

Finally, maternal incarceration may lead to worse adolescent outcomes by stigmatizing children among their peers, leading to symptoms of depression and isolation (Dallaire 2007). One way of estimating the level of social stigma attached to experiencing maternal incarceration is to examine the *prevalence* of the phenomenon in the child's school setting. Nesmith and

³ Formal kinship care generally involves placements with kin after children have been removed from their parents' homes through a judicial determination, while informal kinship care arrangements occur between children's parents and relatives voluntarily (Anderson and Righton 2001).

Ruhland (2008) found that children with incarcerated parents would often seek companionship from other children who had also experienced parental incarceration and form supportive relationships that would help them feel less marginalized. Myers et al. (1999) also report that the stigma of incarceration is felt most strongly by children from communities in which incarceration is unusual and for whom crime is atypical. As such, the negative effects of stigma are weaker for families or communities that have experienced incarceration before or for African-American families who see incarceration as related to prejudice rather than an individual problem (Myers et al. 1999). Thus, I assume that the stigma attached to maternal incarceration is greater for children who attend schools that have fewer mothers that have been incarcerated.

The negative effect of stigma from maternal incarceration may be lessened by having peers who share this experience and provide additional social support or reinforce one's coping efforts. However, if children with incarcerated mothers are disproportionately sorting themselves into schools that are located in disadvantaged neighborhoods with poorer school quality measures, attending a school with low social stigma may present more challenges and ultimately hurt the child's development. Research on adolescent delinquency and risky behavior also confirms the risks associated with negative peer influences and in-school friendships across all races and ethnicities (Gardner and Steinberg 2005; Haynie and Payne 2006). To account for these concerns, I control for school quality explicitly in the study by including a measure of average school performance (i.e. standardized reading test scores on the Iowa Tests of Basic Skills (ITBS) and/or Prairie State Achievement Examination (PSAE) in 2005).

In addition to the three mechanisms outlined above, there are other processes that have been suggested to influence how children react to maternal incarceration. Prior studies examining the effects of parental incarceration have found heterogeneity in the effects by

children's gender as well as by age at the timing of incarceration. For example, Wildeman (2008) finds that among young children between the ages of three and five only boys tend to experience an increase in physically aggressive behaviors following paternal incarceration. Children's racial-ethnic status has also been suggested as an important factor given the protective process of relying on kin support that uniquely occurs in families of color (Jarrett and Jefferson 2004; Poehlmann 2005). The racial and ethnic difference in the role of extended family members is partly reflected in children's placement following maternal incarceration (Enos 2001): white children are much more likely to be placed in foster care than African-American or Hispanic children but are also more likely to be living with their fathers. Finally, ethnographic studies of women in prison reveal that the mother's offense type may be relevant to children's outcomes given that incarcerated mothers view certain crimes as not conflicting with being a good mother but instead supporting it. Most typically, women incarcerated for property crimes or drug sales viewed their crimes as a means for increasing family income and fulfilling their responsibilities as sole providers for their children (Enos 2001).

METHOD

Data

The analysis of the effects of maternal incarceration on children's high school graduation status uses data from four sources, the Illinois Department of Corrections (IDOC), the Cook County Jail (CCJ), Chicago Public Schools (CPS), and the Project of Human Development in Chicago Neighborhoods (PHDCN).⁴ Data from the IDOC and CCJ each contain information on

⁴ Chapin Hall Center for Children at the University of Chicago merged the data from IDOC, CCJ, and CPS. They based its matches on a statistical model that estimates the probability that two

all female prison and jail incarcerations in Illinois, respectively, from January 1, 1993 to June 30, 2001.⁵ Mother level information from the IDOC and CCJ data was merged on to child level school enrollment data from CPS during academic years from 1994 to 2003 by Chapin Hall Center for Children at the University of Chicago. This process effectively creates a sample of children enrolled in CPS during 1994 and 2003 whose mothers have entered prison or jail at least once during 1993 and 2001. The study examines the effect of maternal incarceration on dropping out of school for children who are observed to be enrolled in school prior to the age of 14.

To create a comparison group of children whose mothers are not incarcerated, a subsample of children from the PHDCN was appended on to this dataset. The PHDCN is a three-wave longitudinal cohort study that collected survey data from households in Chicago of about 6000 randomly selected children for seven age cohorts – 0 (within six months of birth), 3, 6, 9, 12, 15, and 18 at baseline. The three-wave sampling period began in 1994 and concluded in 2002. In-person interviews with the sample subjects (children) and their primary caregivers are

records in two different administrative databases are for the same person using matches between as many variables as possible. These variables included all known last names, first names, birth dates, race/ethnicity indicators, and last known residence. Chapin Hall did not have individual's social security number in the IDOC file. The match rate in Cook County (including Chicago) was 78 %.

⁵ Data are only available for female inmates in prison or jail who have received state welfare benefits including TANF/AFDC, Medicaid, Food stamps during 1990 and 2001. This comprises roughly 82 % of all female inmates.

available for age cohorts 3, 6, 9, 12, and 15.⁶ For the purpose of this study examining adolescents' high school graduation status, I limit the sample to only include children between the ages of 14 and 19 during the observed periods.

The onset of school dropout age is chosen to be age 14 and the data is right-censored at age 19. There are a total of 11,200 children enrolled in CPS with mothers incarcerated in prison or jail who fit the above criteria. The sample is further restricted to 6,199 children by excluding children who do not experience maternal incarceration prior to age 14. However, among the 6,199 children, a substantial number of children continue to experience maternal incarceration after the age of 14 since many of the mothers are repeat offenders. Of the 6,199 children, 2,254 children are observed to have dropped out of high school (36.4 percent) and the average grade at dropout is about 9.4 with a standard deviation of 1.0.

There are a total of 2,445 children observed in the PHDCN sample between the ages of 14 and 19 who are enrolled in school at age 14. To make sure that children in the PHDCN sample do not experience maternal incarceration, I further drop children who report that their mothers have a criminal record or legal problems resulting in 2,390 children.⁷ The PHDCN sample is further restricted to 2,385 children because some children are missing information on questions asking whether they are currently attending school or not during all three waves of the survey. Of the 2,385 PHDCN comparison group children, 234 children reported dropping out of

⁶ For cohort 0, children were not interviewed, while for cohort 18, primary caregivers were not interviewed.

⁷ 55 children dropped from the PHDCN comparison group because they reported their mothers to have had a criminal record or legal problems.

high school (10.1 percent) and the average grade at dropout is 9.8 with a standard deviation of 1.5.⁸

Children with mothers incarcerated in prison or jail are considered to have dropped out of high school if they have left CPS for reasons such as dropout, being committed to a non-CPS correctional institution, or lost and cannot be located by a truant officer. Children who are observed to leave CPS due to reasons such as transfer, graduation, or death are not considered dropouts. Children in the PHDCN are regarded high school dropouts if they report that they are currently not attending school during each of the three waves of interview for reasons other than graduation or illness/injury.⁹

Information on children's legal guardianship is available from the CPS files from academic years 1994 to 2002. Information on the legal guardian of a child is first created at the point of registration into the CPS. The guardian is the person on the child's birth certificate. The record is later updated if there is any change made to the status of the legal guardian and if the child is still attending a school within the CPS. Among the 6,199 children with maternal incarceration spells, only 7 children (0.1 percent) have no information on guardianship. Although this is a very small number, to address concerns related to any systematic differences between children missing guardianship information and those who are not, an indicator for children with missing guardianship information is created and included in all analyses. Information on children's legal guardianship is not available in the PHDCN study. However, they do ask

⁸ Last grade prior to dropout was missing for 28 children. The mean and standard deviation of dropout grade is computed for the 213 children who reported their grade at dropout.

⁹ Responses to reasons for not attending school include refuse to answer, graduated, drop out, expelled, illness or injury, and other.

questions about the primary caregiver's relationship to the child. For lack of a better measure, I use information on primary caregivers to proxy for comparison group children's legal guardianship. Using the primary caregiver as a proxy for children's legal guardian will most likely overstate the extent to which children are placed under non-maternal guardianship since most relative caregivers provide informal care.¹⁰

Another concern is related to the lack of information on children sampled from the age cohort 18. As noted in footnote 7, primary caregivers were not interviewed for children in age cohort 18 and there is no information on primary caregivers in the subjects' interview data. As a result, all 610 children sampled from age cohort 18 are missing information on primary caregivers.¹¹ Combined with the other two children from age cohorts 9 and 15 who are missing information on the primary caregiver, the total number of children with missing information on primary caregivers is 612 children (25.7 percent) among the total 2,385 children in the comparison group. Further analysis suggests that children from age cohort 18 are more likely to be high school dropouts, less likely to be Hispanic, and less likely to be born from teenage

¹⁰ This will bias the results on the effects of experiencing a change in guardianship to find a smaller positive effect if children in the comparison group who are removed from their mother's primary care but still remaining under her guardianship are less likely to drop out compared to children in the comparison group who are removed from maternal primary care as well as guardianship. On the other hand, if children in the comparison group are more likely to drop out when they are removed from maternal guardianship as well as from her primary care, the estimated effects may be overstating the positive effects.

¹¹ Since children from age cohort 18 are missing data on their primary caregivers as well as on their biological mothers, information on the age of the mother at child's birth is also missing.

mothers. To address concerns related to any systematic differences between children in different age cohorts, indicators for each age cohort 9, 12, 15, and 18 are included in the analyses. In addition, separate analyses was conducted excluding age cohort 18 children from the comparison group and only using the remaining 1,775 children. The results are not qualitatively different from those reported below and are available upon request.

Measures

The goal is to examine the effect of maternal incarceration on the likelihood of high school dropout for adolescents as well as to understand the mechanisms that may mediate or moderate such effects. To estimate discrete-time event history models, the data are converted into a child-year data set, where each individual record is converted into a number of child-year observations. High school dropout is indicated by a binary variable that equals 1 in the year the student leaves school for an invalid reason as define above and 0 for all earlier years.

To capture the incapacitation effects of incarceration, I use a time-varying indicator variable that equals 1 if the child's mother is observed to be incarcerated during that year and 0 otherwise (called *Mother currently incarcerated*). A second variable is created to capture the overall long term effects of maternal incarceration and indicates 1 if the child experiences maternal incarceration prior to age 14 and 0 otherwise (called *Mother ever incarcerated*).¹² The frequency and length of maternal incarcerations will be partially accounted for with the use of the time-varying indicator, *Mother currently incarcerated*. However, given that a substantial

¹² Since all children from CPS have mothers incarcerated in prison or jail prior to age 14, the variable *Mother ever incarcerated* will be 1 for children from CPS and 0 for children from the comparison group.

number of mothers enter prison or jail for terms shorter than a year and since some of them are incarcerated multiple times a year, direct measures of length and frequency are also created.

Length represents the number of months a mother is observed to be incarcerated, while *Frequency* represents the number of incidences a mother enters prison or jail. In addition, to account for differences between prison and jail incarcerations, a dummy variable, *Jail only*, is created to indicate children whose mothers enter jail only.

To directly examine the effects of experiencing a change in guardianship during the year of and years following maternal incarceration, additional time-invariant indicators are created for the seven mutually exclusive scenarios – *Maternal guardianship only*; *No change in non-maternal guardianship*; *Change from mother to father*; *Change from mother to nonparent relative*; *Change from mother to non-relative*; *Other changes*; and *Missing*. These seven indicators represent whether children have ever experienced a change in maternal guardianship following their mother’s incarceration. Children remaining under maternal guardianship during the entire sampling period with no change fall in the *Maternal guardianship only* category, while children who were under the guardianship of their grandmothers or fathers prior to maternal incarceration and experience no change afterward are categorized as *No change in non-maternal guardianship*. *Other changes* category contains children experiencing changes from non-maternal guardianships (e.g. from grandmother to aunt), those with multiple types of changes in guardianships, and those who experience changes in guardianship prior to maternal incarceration.

A measure for the stigma associated with maternal incarceration is created using a relative measure of the total number of children with incarcerated mothers in each school. Specifically, I add all children enrolled in Chicago Public Schools (CPS) between September, 1991 and May, 2004 whose mothers have entered prison or jail during 1993 and 2001 and divide

that by each school's enrollment size multiplied by the total number of years observed (=13 years).¹³ This generates the ratio of children experiencing maternal incarceration during a given school year within each school. Schools are categorized into four groups: 1) less than 10 percent of student body experienced maternal incarceration; 2) less than 25 percent but 10 percent or more of student body experienced maternal incarceration; 3) less than 50 percent but 25 percent or more of student body experienced maternal incarceration; 4) 50 percent or more of student body experienced maternal incarceration. The greater the percentage of children experiencing maternal incarceration per year, the lower the stigma associated with maternal incarceration. In order to differentiate the effect of stigma from poor school quality, a measure of average school performance is also included in the model.¹⁴

Finally, to reduce bias in the incarceration effects, I also control for children's race (African American, Hispanic, white, and other), number of siblings, gender, age at first maternal incarceration, mother's age at child's birth, education level, and offense type for incarceration in the estimation. To account for duration dependence, robust standard errors clustered on the child are used in addition to including a series of age indicators from ages 14 to 19 in the model.

¹³ I later multiply this variable by 100 to obtain the relative percentage of children with incarcerated mothers. Information on school total membership (i.e. enrollment) for Chicago public schools is available on their website.

¹⁴ Average peer performance for a given school is measured as the average standardized reading test score on the Iowa Tests of Basic Skills (ITBS) and/or the Prairie State Achievement Examination (PSAE) in 2005. Because earlier information is not available on the CPS website, this study uses test score and enrollment information reported in 2005.

Discrete-Time Hazard Model

It is very difficult to isolate empirically the causal effect of maternal incarceration on children's outcomes from the selection effect in which disadvantaged adolescent children are more likely to drop out of high school regardless of their mother's incarceration. Prior research on maternal incarceration and children's outcomes have tried to account for this selection effect by controlling for a rich set of demographic background characteristics, children's fixed unobserved characteristics, and by using matching techniques based on propensity scores (Cho 2009a; 2009b; Geller et al. 2008; Wildeman 2008). The analysis presented in this study treats maternal incarceration as a rival explanation that accounts for part of the observed association between maternal incarceration and children dropping out of high school before graduation. The data controls for a variety of measures of mother and child level characteristics to identify the link between maternal incarceration and children's high school graduation status.

The relationship between the hazard rate of children dropping out of school and having a mother incarcerated is modeled using discrete-time event history analysis since such method does not require the a priori specification of a shape for the hazard function and since age at dropout is usually measured in discrete-time rather than in continuous time (that is, reports of the age at which an individual drops out of school are generally rounded to the last birthday rather than reported as an exact age). The following discrete-time event history model for child i at age t is estimated (Lopoo and Western 2005; Reardon, Brennan, and Buka 2002):

$$\ln\left(\frac{h_{it}}{1-h_{it}}\right) = \beta_{0t} + \beta_1 MatInc_{it} + \beta_2 X_i + \beta_3 Z_{it}, \quad (1)$$

where h_{it} is the probability of dropping out of school given that the child i is still in school prior to t . β_{0t} is the hazard rate for the baseline group of each age group t , $MatInc_{it}$ is a vector of

maternal incarceration variables (i.e. *Mother currently incarcerated*, *Mother ever incarcerated*), X_i is a vector of time-invariant child- and mother-level characteristics, and Z_{it} is a vector of time-varying background characteristics.

Next, vector of covariates are included to capture the effects of the length and frequency of maternal incarceration, change in guardianship, and stigmatization.

$$\ln\left(\frac{h_{it}}{1-h_{it}}\right) = \beta_{0t} + \beta_1 MatInc_{it} + \beta_2 X_i + \beta_3 Z_{it} + \beta_4 Dosage_i + \beta_5 Guardianship_{it} + \beta_5 Stigma_i \quad (2)$$

$Dosage_i$ is a vector indicating the length of maternal incarceration in months as well as the number of prison or jail incarcerations for child i . $Guardianship_{it}$ is a vector indicating the different kinds of guardianship change child i experiences at year t and $Stigma_i$ is a vector denoting varying levels of stigma associated with maternal incarceration in child i 's school setting.¹⁵

Figure 1 presents hazard estimates of adolescent children's school dropout behavior by age for children with incarcerated mothers and children in the comparison group. Compared to children whose mothers have no criminal records, children with incarcerated mothers are not only at greater risk of school dropout for all age groups but they are at greater risk of dropping out at a younger age. Specifically, children whose mothers enter prison or jail have a 17 percent chance of dropping out of school at age 17 and have slightly lower chances at age 18. On the other hand, children in the comparison group have at most less than an 8 percent chance of

¹⁵ The variable *Stigma* indicates the percentage of students with incarcerated mothers relative to the total enrollment in a given school per year. The lower the estimate, the higher the stigma attached to maternal incarceration.

dropout in any given year between ages of 17 and 18. These raw numbers indicate that children of incarcerated mothers are at more than double the risk of failing to complete school than a typical adolescent. In the following section, various mechanisms that may explain the high risk of school dropout are examined.

RESULTS

Descriptive statistics on the sample children are reported in Table 1. Not surprisingly, children whose mothers enter prison or jail are much more likely to drop out of school than children whose mothers are not incarcerated (36 percent versus 10 percent). Great disparities in race and maternal education also exist by maternal incarceration status. Among children with incarcerated mothers, 89 percent are African American and 6 percent are Hispanic, whereas 38 percent of the comparison group children are African American and 43 percent are Hispanic. Children with incarcerated mothers are more likely to have a high school dropout mother themselves (46 percent versus 41 percent), and are much less likely to have a mother who obtained postsecondary education (12 percent versus 37percent). In addition, children with incarcerated mothers are more likely to have many siblings and have mothers who were 18 or younger at the time of their birth.

The 6,199 children in the maternal incarceration group are observed to attend 574 schools in the CPS system which is comprised of roughly 650 schools. However, these children are not equally widespread across all 574 schools as is reflected in the large standard deviation and skewed distribution of the variable *stigma* which denotes the average percentage of children with incarcerated mothers in a given school per year relative to the entire school population. More than a quarter of the schools have less than 10 percent of their students experiencing maternal

incarceration, whereas, in the opposite end of the distribution, a quarter of these schools have more than a third of their student population experiencing maternal incarceration. This suggests that the sample children may indeed be exposed to different levels of stigma at least in their school environment. It is also clear that the schools these children are attending are not among the high performing ones in CPS. The average school performance on standardized reading test scores is very low once weighted by the number of sample children in each school. Specifically, the average child in the maternal incarceration group attends a school that scores 0.4 standard deviations below the average school on the reading section of ITBS/PSAE.

Table 1 also presents detailed information on maternal incarceration(s) and children's change in guardianship. On average, a child is separated from the incarcerated mother for a total of 6.7 months and almost three times (2.7 times) due to her incapacitation. The majority of children with incarcerated mothers experience maternal incarceration in jail only with the most common offense being drug-related crimes. There are also marked differences in the frequency of children experiencing a change in guardianship by maternal incarceration status. Not surprisingly, children with incarcerated mothers are much less likely to be placed under maternal guardianship during the entire sampling period than children in the comparison group (58 percent versus 82 percent). They are also more likely to be removed from maternal guardianship and be placed with other caregivers such as fathers, grandparents, non-related adults, and other relatives (11.5 percent versus 2.3 percent). Lastly, the table shows that while 22.6 percent of children with incarcerated mothers will experience some kind of change in guardianship, only about 6 percent of comparison group children will have shared such experience. Given that information on guardianship for the comparison group is based on reports about the child's primary caregiver and not on legal guardianship, the true degree of discrepancy in guardianship

change is likely to be understated in Table 1. This is because change in the primary caregiver usually precedes change in legal guardianship and many disadvantaged minority households will not pursue a change in legal guardianship.¹⁶

I report estimates on the hazard rate of dropping out of school in Table 2. The first column shows differences in dropout status by individual and household level background characteristics such as race, gender, maternal education level, number of siblings, and teenage mother controlling for age and missing variables. In a given year, the odds of high school dropout among African-American children are not statistically significantly different from whites, while the odds of dropout for Hispanics are only about 67 percent as high as for whites. Girls are observed to have odds of dropout that are only about 70 percent as high as for boys, while children with 3 or more siblings are at much greater risk of dropout compared to children who have 2 or less siblings. Finally, maternal education level is negatively correlated with dropout and children from teenage mothers are more likely to drop out.

How much of the high school dropout rate can be explained by maternal incarceration? In the second column of Table 2, three indicator variables for maternal incarceration as well as the child's age and offense type of mother's first incarceration are included in the model. Once controls for maternal incarceration are included, Hispanic children are no longer observed to be at a significantly lesser risk of school dropout than white children, while African American children are observed to have odds of dropout that are only about 80 percent as high as for whites.

¹⁶ Several researchers have documented the reluctance of extended family members to assume the role of legal guardian for children under their care mainly because this would entail proving that the child's parents are unfit (Hanlon et al. 2007).

This may be due to the high concentration of maternal incarceration incidences among African American children in the sample.

I find that children whose mothers are incarcerated are at greater risk of dropping out during the year(s) of their mother's incarceration compared to children whose mothers are not incarcerated. Specifically, their odds of dropout during the year of maternal incarceration are 1.35 times as high as the odds of dropout for other children whose mothers are not incarcerated. This estimate confirms the presence of a negative incapacitation effect on children's dropout behavior. However, once I control for the immediate effects of incapacitation, there is no difference in dropout rates between children who experience maternal incarceration and the comparison group children. That is, even though children with incarcerated mothers have odds of dropout that are 1.31 times as high as the odds of dropout for those whose mothers have no criminal record, the gap in dropout rates are not statistically significant. This implies that there are no lasting effects of maternal incarceration on children's dropout probability. The effects of maternal incarceration do not appear to be different between jail and prison stays. Since children between ages 14 and 19 whose mothers have never been incarcerated have a 2.6 percent chance of dropping out in a given year, the hazard rate of dropout for an adolescent whose mother is currently serving time in prison or jail is estimated to be about 3.5 percent ($=2.6*1.35$).

As expected, I find that both the child's age at maternal incarceration affects their schooling outcomes. Children are at greater risk of school dropout when children first experience maternal incarceration during older ages. Given that the sample age range for first experiencing maternal incarceration is between ages 4 and 14, the findings support the hypothesis that the developmental needs necessary for academic achievement are less likely to be met when children experience maternal incarceration during early adolescence than during early or middle

childhood (Cho 2010). On the other hand, children display different dropout patterns by mothers' offense type but not in the expected direction. In contrast to findings from Enos' ethnographic study (2001), mothers committing property crimes or drug crimes do not appear to be providing higher quality "mothering" than mothers committing sex or person crimes. That is, children whose mothers commit property or drug offenses have higher odds of dropout compared to children whose mothers are incarcerated for crimes such as prostitution or assault.

To further examine the possibility of race and gender moderating the effects of maternal incarceration, I estimated the models including interaction terms of race and gender, respectively, with *Mother currently incarcerated* and *Mother ever incarcerated* (not reported here but available upon request). Both African American and Hispanic children whose mothers have been released from prison or jail have lower odds of dropout than white children whose mothers have been released from prison or jail. These effects are marginally significant. These findings may be due to greater kin support present in minority families. However, race does not have any moderating effects on dropout rates during the year(s) of incapacitation. There is no difference in the current or longer-lasting effects of maternal incarceration on dropout rates by gender.

In the third and fourth columns of Table 2, the total length of maternal incarceration (in months) as well as the total number of maternal incarceration spells are included to better control for the varying dosages of maternal incarceration. Length of incapacitation does not affect a child's dropout probability, but the total number of maternal incarcerations slightly increases the odds of dropping out. Once frequency of maternal incarceration is controlled for, the odds of dropout during the year of maternal incarceration is only 1.24 times as high as the odds of dropout for children in the comparison group.

Column five of Table 2 reports estimates when indicators for different types of guardianship change are added on to the model. The benchmark group is no change in maternal guardianship (i.e. under maternal guardianship prior to and after incarceration). Experiencing a change in guardianship is correlated with maternal incarceration and may exacerbate the negative effects on school dropout. Among the indicators for different types of change in guardianship, only children who remain with a non-maternal guardian have slightly lower odds of dropout than children who remain under maternal guardianship. However, the more interesting finding is the large increase in the coefficient of *Mother ever incarcerated* once change in guardianship is controlled for in the model. Since the omitted group for change in guardianship refers to children who remain under maternal guardianship, the coefficient of *Mother ever incarcerated* indicates the large discrepancy in dropout rates among children remaining under maternal guardianship by maternal incarceration status. The estimate suggests that if a typical adolescent in the comparison group living under the guardianship of the mother has a 2.6 percent chance of dropping out in a given year, an adolescent who remains under maternal guardianship even after her incarceration will have a 33.5 ($=2.6*12.90$) percent chance of dropping out in that same year.

I further explore the effects of experiencing a change in guardianship in column six of Table 2 by interacting *Mother ever incarcerated* with the indicators for different types of guardianship changes. These interaction terms will capture the varying contexts in which children experience a change in guardianship by maternal incarceration status. Among children with incarcerated mothers, those placed under paternal guardianship have odds of dropout that are only 25 percent as high as for children who remain under maternal guardianship. Likewise, children who are placed with a non-relative guardian such as foster parents have much lower odds of dropout than children remaining under maternal guardianship, but this relationship is

only statistically significant at the 13 percent level. In contrast, however, among children in the comparison group, the risk of dropout increases when children are removed from maternal care and placed under paternal care or under the care of a non-relative caregiver. I further examine the differential effects of experiencing a change in guardianship by the child's gender and find no difference between boys and girls.¹⁷

Finally, to examine the effects of stigma associated with maternal incarceration, a variable denoting the percentage of students who have experienced maternal incarceration in a given school is included in column seven. To account for nonlinear effects, three indicators of varying levels of stigma were created and included in column eight. Results suggest that, among adolescents who experience maternal incarceration, the odds of dropout are slightly higher for students attending schools with more children who have experienced maternal incarceration (i.e. the "low stigma" schools). This does not support the hypothesis that children are adversely affected by the negative stigma associated with maternal incarceration. However, this does not imply that children are always better off when attending schools with higher stigma. In fact, the effect appears to be nonlinear. In this study, I find that children are the least at risk of school dropout when attending schools that have a moderate percentage (10 to 25 percent) of students who also share the experience of maternal incarceration. Both estimates in columns seven and eight include controls for school quality since there most likely will be a positive correlation between school quality and stigma. School quality also has a significant effect on children's dropout behavior where a one standard deviation increase in average reading test score will lead to odds of dropout that are about 14 percent lower, all else equal.

¹⁷ Results are not reported here but are available upon request.

DISCUSSION

As female incarceration rates climb at an increasing rate, there is greater need to better understand the processes behind youth disadvantage associated with maternal incarceration. Many researchers have argued various mechanisms through which maternal incarceration disadvantages youth. The primary objective of this study is to examine the extent to which these underlying mechanisms explain adolescents' high school dropout behavior following their mother's incarceration. Using data constructed from merging several administrative datasets in Illinois and the Project of Human Development in Chicago Neighborhoods (PHDCN), three mechanisms were examined.

In regard to the first mechanism advanced at the outset of this paper, I find negative incapacitation effects associated with maternal incarceration on children's dropout behavior. Results show that adolescents whose mothers are currently incarcerated in either prison or jail are about 21 to 24 percent more likely to drop out during that year compared to similar adolescents whose mothers are not incarcerated. However, results do not suggest that the negative effects of her incarceration extend after her release (see column four of Table 2). Results also indicate that frequent incarcerations increase the odds of dropout, whereas the total length of a mother's prison or jail stay has no effect. Although current data does not allow one to analyze why frequency is stronger predictor of dropout behavior than separation length, prior research suggests that numerous disruptions in home and school lives of school-aged children following maternal incarceration are leading causes for negative outcomes (Dallaire 2007). It is possible that frequent incarcerations entail greater disruption than longer prison or jail spells –

for example, a child whose mother enters jail five times for a month each may be worse off than a child whose mother enters prison once for a year.

Related to the second hypothesis, I find that being removed from maternal guardianship has very different implications to children with incarcerated mothers from children with mothers who have no criminal records (column six of Table 2). Being removed from maternal guardianship and placed with the father or a non-relative adult leads to lower dropout rates for children with incarcerated mothers but not for children in the comparison group. On the other hand, children who are placed with other relatives following maternal incarceration are not less (or more) likely to drop out than children remaining under maternal guardianship. Given that it is most common for grandparents or aunts and uncles to assume the guardianship of children with incarcerated mothers (Glaze and Maruschak 2008), the finding here raises concerns about the stability and living environment of these placements.¹⁸ It is still possible, however, that children who are moving to paternal guardianship following maternal incarceration are those who have other unobserved characteristics that are positively correlated with one's decision to remain in school (such as higher paternal education level).

Regarding the third hypothesis, stigma, results show that the odds of dropout are not statistically different between a student who attends a school that has 50 percent or more of its student body experience maternal incarceration and one who attends a school with less than 10

¹⁸ Glaze and Maruschak's report in the Bureau of Justice Statistics find that 37 percent of minor children are taken care of by their fathers during their mother's incarceration in state prison, while 45 percent of them are placed in their grandparents' care. About 23 percent of minor children are placed with other relatives, 11 percent are in foster care, and about 8 percent are with friends and others.

percent of its student body experiencing maternal incarceration, all else equal. However, findings do suggest that the odds of dropout are lowest when a non-insignificant proportion of the student body (10 to 25 percent) shares the experience of maternal incarceration. As is documented by other studies, children of incarcerated mothers may suffer less from the negative effects of secrecy and social isolation in settings where teachers and peers better understand the phenomenon and are able to intervene appropriately (Dallaire 2007; Nesmith and Ruhland 2008). The present study also finds a strong positive effect of the quality of the schooling environment. This suggests that policymakers and practitioners should recognize the school setting as a place of intervention that provides not only high quality educational services but also the additional resources and services that may be needed to keep these children in school.

Taken together, results from this study point to a large but temporary negative effect of maternal incarceration on adolescents' school dropout behaviors. However, it is important to note that the estimates reported here may overstate the magnitude of the effect due to the possibility of selection bias. Selection bias may occur if children whose mothers enter prison or jail share experiences and characteristics that are not controlled for in the above models but are positively correlated with one's probability of dropping out of school. Despite the many advantages of using large administrative datasets such as large sample size and detailed records on maternal incarceration and on children's schooling, an important limitation is that they do not provide much information on family and neighborhood contexts related to child development. There may be important omitted variables that may further mediate or moderate the effects of maternal incarceration such as household composition, income, parental substance abuse, and neighborhood characteristics (Kirk 2008). Still, the significant incapacitation effect is extremely stable when controls for dosages of incarceration, change in guardianship, stigma, and school

quality are included. More research on the effects of maternal incarceration is necessary to further disentangle the complex mechanism that may further disadvantage youths that are already at risk of poor outcomes.

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