Parental Incarceration and Adolescent Social Networks: An Examination of the Social Lives of Children of Incarcerated Fathers

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Abstract

As the incarceration rate has exploded over the past 40 years, parental incarceration has become an increasingly common event in the lives of American children, particularly minority children and children of poorly educated parents. Recent studies have explored the implications of parental incarceration for children's behavioral problems, academic achievement, health, and housing stability, but none have yet examined the social lives of children affected by parental incarceration. Previous research suggests that the composition of adolescents' social networks is important for exposing them to, or insulating them from, disadvantageous peer relationships and providing social support during a critical developmental period. In this paper I bring together these two strands of research to examine the social networks of adolescents who experience paternal incarceration. Using network data from the National Longitudinal Study of Adolescent Health, I explore the relationship between paternal incarceration during childhood and adolescents' number of friends, social location within their schools, and friend characteristics. On average, children of incarcerated fathers are more socially isolated than other adolescents, with friends who are less advantaged, less academically successful, and more delinquent than the friends of other adolescents. I also examine racial differences in these relationships, finding less substantial differences in friend characteristics for black adolescents who experience paternal incarceration than for white and Latino respondents. These findings suggest that programs that encourage prosocial relationships may be beneficial for children affected by paternal incarceration. They also further our understanding of the full extent to which both (former) inmates and their children are marginalized in American society.

Introduction

The incarceration rate in the United States more than quadrupled between the late 1970s and the early 2000s (Snell 1995; Glaze and Herberman 2013; National Research Council 2014). By the end of 2012 more than 2.2 million adults were incarcerated in American jails and prisons (Glaze and Herberman 2013; National Research Council 2014). Although this number marks a slight decline from the peak of 2.3 million adults in 2009 (Glaze and Parks 2012), the American incarceration rate remains the highest in the world (Walmsley 2013).

Unsurprisingly, the rate at which American children experience parental incarceration also increased substantially over this period, with children born in 1990 experiencing nearly twice the risk of parental incarceration as those born in 1978 (Wildeman 2009). An estimated 2.7 million American children had a parent in jail or prison in 2010, representing 11.4 percent of all black children, 3.5 percent of Hispanic children, and 1.8 percent of white children (The Pew Charitable Trusts 2010). In addition to being unequally distributed by race, previous research indicates that parental incarceration is disproportionately high among children with less educated parents. Approximately 4 percent of white children and 25 percent of black children born in 1990 experienced parental incarceration by the time they turned 14, but these percentages increase to 7 percent and 50 percent, respectively, among children born to high school dropouts in 1990 (Wildeman 2009).

Previous research indicates that parental incarceration is associated with a variety of disadvantages for children, including housing instability (Geller et al. 2009; Tasca, Rodriguez, and Zatz 2011; Wildeman 2014), household economic strain (Phillips et al. 2006; Geller, Garfinkel, and Western 2011; Schwartz-Soicher, Geller, and Garfinkel 2011), parental union dissolution (Lopoo and Western 2005; Western 2006; Geller 2013; Turney and Wildeman 2013), neglectful parenting (Turney 2014), health problems (Roettger and Boardman 2012; Lee, Fang,

and Luo 2013), poor educational outcomes (Foster and Hagan 2007; Cho 2011; Hagan and Foster 2012), and substance abuse (Foster and Hagan 2013). While children of incarcerated parents might do poorly even in the absence of parental incarceration because of the variety of disadvantages associated with having a parent who is likely to go to jail or prison, the current literature suggests that parental incarceration adds an extra layer of disadvantage to the already challenging lives of poor, often minority, children in the US.

In an attempt to better understand the full range of challenges faced by children of incarcerated parents in the US, this study investigates their social lives, asking whether and how the social networks of children with incarcerated fathers differ from those of other children. This question is well worth asking since previous research suggests that adolescent social networks are important for exposing children to, or insulating them from, disadvantageous peers (Giordano, Cernkovich, and Pugh 1986; Cairns et al. 1988; Dishion, McCord, and Poulin 1999), providing social support during a critical period of development (Newcomb and Bentler 1988; Giordano 2003), and influencing delinquency, aspirations, and educational attainment (Poole and Regoli 1979; Vitaro et al. 1997; Vitaro, Brendgen, and Tremblay 2000; Prinstein, Boergers, and Spirito 2001; Haynie 2002; Weerman and Smeenk 2005; Ingram et al. 2007; Kandel and Lesser 1969; Kandel 1978; Davies and Kandel 1981; Flashman 2014).

I use network data from the National Longitudinal Study of Adolescent Health (Add Health) to examine how many friends adolescents with incarcerated fathers have, how well they are connected to other students in their school, and who their friends are. I find that children of incarcerated fathers are more socially isolated than other adolescents and have friends who are less advantaged, less academically successful, and more delinquent than other adolescents' friends. To my knowledge this is the first paper to examine the social networks of adolescents

who experience parental incarceration. In doing so it illuminates an additional dimension of disadvantage in the lives of the millions of American children affected by parental incarceration each year and draws further attention to the variety of ways in which both prisoners and their children are marginalized in American society.

Background

Parental Incarceration and Correlated Adversity

Incarceration is concentrated among the most disadvantaged members of American society. Adults with low levels of education, those with low levels of employment and low wages, and minorities are vastly overrepresented in American prisons and jails (Pettit and Western 2004; Western and Wildeman 2009; Western and Pettit 2010; The Pew Charitable Trusts 2010). Thus, the children most affected by parental incarceration are those who already tend to face multiple disadvantages. Previous studies indicate that poor children are disproportionately exposed to family turmoil, violence, harsh and unresponsive parenting, housing instability, high crime neighborhoods, and polluted and unsafe environments (Evans 2004). They are also less likely to have well-qualified teachers and to experience cognitive simulation and enrichment at home (Evans 2004). To the extent that children who experience parental incarceration are also likely to live in poverty, we would expect these children to experience many of the disadvantages listed above with or without parental incarceration.

Prior research on outcomes for previously incarcerated adults, however, suggests that parental incarceration may introduce further disadvantage into the lives of already disadvantaged children. Previous studies link incarceration to labor market discrimination (Pager, Western, and Bonikowski 2009; Pager 2003), decreased earnings (Western, Kling, and Weiman 2001; Holzer 2009), decreased employment (Holzer 2009), physical and mental health problems (Hammett,

Harmon, and Rhodes 2002; R. C. Johnson and Raphael 2009; Schnittker, Massoglia, and Uggen 2012; Turney, Wildeman, and Schnittker 2012; Lee, Fang, and Luo 2013), housing instability (Geller and Curtis 2011), and relationship dissolution (Nurse 2002; Lopoo and Western 2005; Western 2006; Turney and Wildeman 2013). All of these outcomes can have important consequences for children and may help explain the long list of disadvantages that children of incarcerated parents face. For example, Wildeman (2014) finds that increases in family economic hardship mediate part of the relationship between parental incarceration and child homelessness, and Turney and Wildeman (2013) show that parental relationship changes help to explain the association between parental incarceration and changes in parenting practices.

As a result of this correlated adversity and the limitations of most datasets with information on children of incarcerated parents, identification of the causal effects of parental incarceration is challenging (E. I. Johnson and Easterling 2012; Wildeman, Wakefield, and Turney 2013).[1] This paper, therefore, provides a descriptive analysis of the structure and content of the social networks of children with incarcerated parents as a way to begin exploring an important topic about which we currently know nothing. Most importantly, this paper seeks to expand our understanding of how the children of incarcerated parents are faring in their daily

[1] Selection bias concerns could be addressed by pre- and post-incarceration observations, but these are often not available in the data. This is particularly true of Add Health, in which the vast majority of respondents who experience parental incarceration have already had a parent incarcerated prior to the first survey. Because the Fragile Families survey follows children since birth, these data avoid the post-treatment observation problem, but they have other shortcomings. The two year gap between the 3-year and 5-year surveys means that parental incarceration – and its potential effects in terms of child outcomes – cannot be timed precisely. As a result, studies that rely upon Fragile Families data must assume that parental incarceration at some point during this interval was the cause of any observed changes in children between the 3- and 5-year surveys.

The Panel Study of Income Dynamics is of relatively little use in the area of parental incarceration as child outcomes (prior to adulthood and the establishment of an independent residence) are only captured for members of the relatively small Child Development Supplement sample, very few of whom have experienced parental or caretaker incarceration. Likewise, the National Longitudinal Survey of Youth, Children and Young Adults study only follows the children of female NLSY79 members, very few of whom were ever incarcerated. Unfortunately, the NLSY97 only asks sample members whether either of their parents was ever incarcerated – no data are gathered on the timing or duration of incarceration.

lives. Additionally, by understanding how the social lives of adolescents experiencing paternal incarceration differ from those of other adolescents, these descriptive results can pave the way for future research that seeks to develop hypotheses about what might cause those differences and what the implications of such differing social experiences may be.

Anticipated Differences in Social Network Characteristics

There are two primary dimensions along which a child's social network may vary: in its structure and in its content. By structure I mean the broad characteristics of a respondent's social network: e.g., the number of social ties she has, how central – or peripheral – her location is in the whole network, etc. By content I mean the specific characteristics – or what you might call quality – of her social ties: e.g., proportion of friends from two parent homes, mean GPA of friends, etc. Children of incarcerated parents may be socially marginalized in terms of both the structure and content of their social networks.

There are a number of reasons to believe that the social networks of children with incarcerated parents may differ from those of other adolescents in terms of both structure and content. Perhaps the most obvious reason is that parental incarceration may carry a stigma that could influence the social experiences of adolescents. Indeed, several studies offer support for this notion. Donald Braman (2004), for example, argues that families – including children – experience shame and stigma as the result of having an incarcerated relative, even in neighborhoods where incarceration is common, and Dallaire, Ciccone, and Wilson (2010) claim to find evidence that children of incarcerated parents are stigmatized by their teachers. Moreover, a variety of scholars have suggested that the poor outcomes often observed among children of incarcerated parents are due in part to the stigma surrounding parental incarceration (Gabel 1992; Hagan and Dinovitzer 1999; Murray and Farrington 2005; R. C. Johnson 2009;

Western and Wildeman 2009; Murray and Murray 2010; Besemer et al. 2011; Phillips and Gates 2011).

If children with incarcerated parents are indeed stigmatized, then we would expect to see this reflected in both the structure and content of their social networks. In his classic, *Stigma*, Erving Goffman (1963) suggests that stigmatized individuals often end up socially isolated – either because they are shunned or because they avoid social interactions in anticipation of being shunned – and connected to other stigmatized or marginalized individuals who can relate to their situation. Thus, if children of incarcerated parents are truly stigmatized, we would expect them to have fewer friends and be more marginal in social networks than other adolescents. Moreover, we would also expect them to be more likely to befriend other stigmatized adolescents, like those who also have an incarcerated parent or those who have experienced other forms of family disruption.

Given the vast racial disparities in the prevalence of parental incarceration in the US (The Pew Charitable Trusts 2010), however, the amount of stigma surrounding parental incarceration may vary across race groups. Whites adolescents would presumably be subject to greater stigma than Hispanic and, especially, black adolescents for whom parental incarceration is less unusual. To my knowledge few studies have investigated this assertion, and the limited evidence available does not seem to support this prediction. Cho (2011) finds that the prevalence of maternal incarceration – and, thus, the presumed degree to which maternal incarceration is stigmatized – within a school does not seem to affect the relationship between maternal incarceration and dropout risk. And Braman (2004) claims that the stigma of having an incarcerated family member is high even in neighborhoods where incarceration is relatively common. To the extent that these findings suggest that the stigma of parental incarceration is unmediated by context, we

may not see particularly strong differences in social network outcomes across racial groups, even if stigma is at play. Because it still seems plausible that the stigma of parental incarceration may vary across races, despite the findings from these two studies, I look at the relationship between paternal incarceration and social network outcomes separately for whites, blacks, and Hispanics, in addition to examining this relationship for the sample as a whole.

Previous research indicating that behavioral problems are more prevalent among adolescents who experience parental incarceration provides further reason to expect the structure and content of these adolescents' social networks to differ from those of their peers. For example, various studies have linked parental incarceration to internalizing behaviors and depression in children (Wilbur et al. 2007; Murray and Farrington 2008; R. C. Johnson 2009; Wakefield and Wildeman 2011; Roettger and Boardman 2012; Foster and Hagan 2013; Wakefield and Wildeman 2014), which may in turn cause these children to withdraw from social networks, making them more socially isolated, with fewer friends than their peers (Laursen et al. 2007).

Additionally, many studies have found that parental incarceration appears to increase children's aggressive and antisocial behaviors (Murray and Farrington 2005; Wilbur et al. 2007; Murray and Farrington 2008; Geller et al. 2009; R. C. Johnson 2009; Wildeman 2010; Wakefield and Wildeman 2011; Geller et al. 2012; Murray, Farrington, and Sekol 2012; Wakefield and Wildeman 2014), which may increase a child's risk of social isolation (Cairns et al. 1988; Laursen et al. 2007). Other research shows that aggressive adolescents tend to associate with other aggressive adolescents and that early aggression is associated with delinquency in adolescence (Cairns et al. 1988; Vitaro et al. 1997). Thus, there is good reason to suspect that adolescents who have experienced parental incarceration will have more antisocial, delinquent

friends than other adolescents as a result of their higher prevalence of antisocial and aggressive behaviors.

Both of these channels – stigma and behavioral problems – point to the same set of hypotheses: adolescents who have experienced parental incarceration will be more socially isolated and have fewer, more delinquent, and more disadvantaged friends than their peers. While data limitations prevent me from adjudicating between the relative influence of these two potential mechanisms in this paper, I can at least explore the extent to which these hypothesized social network differences hold true for adolescents who have experienced paternal incarceration.

Adolescents and Peer Groups

Although previous research has not considered adolescent social networks as a byproduct of parental incarceration, they are a potentially important mediating pathway by which parental incarceration may have negative effects on children's lives, as peer groups appear to play an important role in shaping a variety of important adolescent outcomes. Previous research suggests that peers influence adolescents' academic achievement and aspirations (Kandel and Lesser 1969; Kandel 1978; Davies and Kandel 1981; Flashman 2014), alcohol and drug use (Kandel 1978; Prinstein, Boergers, and Spirito 2001; Guo et al. 2002; Lundborg 2006; Clark and Lohéac 2007; Crawford and Novak 2008), and even weight (Trogdon, Nonnemaker, and Pais 2008). A particularly common finding is that the level of delinquency among an adolescents' friends appears to affect the degree to which he or she engages in delinquent behaviors (Poole and Regoli 1979; Vitaro et al. 1997; Vitaro, Brendgen, and Tremblay 2000; Prinstein, Boergers, and Spirito 2001; Haynie 2002; Weerman and Smeenk 2005; Ingram et al. 2007).

Because behaviors and aspirations appear to spread through adolescent social networks, an analysis of the types of friends with whom children of incarcerated parents associate may help explain previous findings of higher rates of delinquency and lower academic achievement among members of this group (Dannerbeck 2005; Murray and Farrington 2005; Aaron and Dallaire 2010; Besemer et al. 2011; Roettger and Swisher 2011; Cho 2011; Hagan and Foster 2012). This may be particularly true with regard to findings of high levels of delinquency, which scholars tend to characterize as a group behavior (Giordano, Cernkovich, and Pugh 1986).

Finally, peer groups are an important domain in which adolescents are likely to experience stigma. Research on adolescents and mental health stigma, for example, suggests that adolescents with mental health disorders are more likely to report feeling stigmatized in their peer group than in any other social context (Moses 2010).

Data, Measures & Analytic Approach

Data

The National Longitudinal Study of Adolescent Health (Add Health) is a nationally representative longitudinal survey that has followed over 15,000 adolescents from grades 7-12 through early adulthood (ages 24-32). Respondents were initially surveyed in the 1994-1995 school year, with follow up interviews in 1996, 2001-2002, and 2008.

Add Health employed a school-based sampling design, selecting a stratified sample of 80 high schools chosen to be representative of US schools with respect to region, urbanicity, school size, school type, and ethnic mix.[2] One feeder middle school was selected for each sampled high school (unless the selected high school spanned grades 7 to 12), adding 52 middle schools to the sample. In-school surveys were administered to all 7th through 12th graders present in these

[2] High schools were defined as schools containing an 11th grade and more than 30 students.

schools on the day of the initial survey (N= 90,118). School administrators were surveyed about the characteristics of each school in both the first and second survey waves (Harris 2013).

To generate the sample for the longitudinal in-home study, students in each of the sample schools were stratified by sex and grade and randomly selected within strata to yield a sample of approximately 200 students from each pair of sampled schools. This core student sample was supplemented with special oversamples of racial and ethnic minorities, sibling pairs, adopted students, and disabled students. The core sample plus the special samples produced a sample of 20,745 adolescents in Wave I. Parent interviews, usually completed by the resident mother, were conducted in respondents' homes in Wave I. A parent completed an interview for 85 percent of students in the longitudinal sample (N=17,670). The fourth wave of the survey in 2008 included 15,701 members of the original 1994 sample, for a 75.7 percent response rate (Harris 2013).

I use data from the Wave I in-school survey, the Wave I in-home survey of longitudinal sample members, and the Wave IV survey of longitudinal sample members in this paper. The Wave I in-school survey collected data on friendship networks, school activities, future expectations, health-related behaviors and conditions, and basic household characteristics. The friendship network data consist of up to five male and up to five female friend nominations for each in-school survey participant. Eighty-five percent of students identified at least one friend (Harris 2013).

Because most nominated friends also completed the Wave I in-school survey, characteristics of respondents' friendship networks can be constructed by linking friends' data from the in-school questionnaire and constructing variables based on friends' responses. Add Health has used these data to construct basic network descriptors for each respondent, respondent-centered measures of friend characteristics, and school-level measures of global

network structure and segregation (Carolina Population Center 2001). I use several of these Add Health-created network measures as dependent variables in this paper.[3] I also use friends' responses from the in-school survey to create additional summary measures of friends' characteristics, such as proportion of friends who live in two-parent households and friends' average delinquency levels.

I use the more detailed data from the Wave I in-home survey of to create control variables for members of the longitudinal sample, to whom these analyses are restricted. I limit the following analyses to members of the longitudinal sample because data on parental incarceration history are only available for longitudinal sample members who participated in the Wave IV survey. Wave IV respondents indicated whether any of their biological parents or, if applicable, social parents (i.e., "mother figure" or "father figure") were ever incarcerated, the number of times each parent was incarcerated (if ever), their own age when each parent was first incarcerated (if applicable), and their age when each parent was last released from prison or jail (if applicable). I use data on biological father's incarceration history for the subsequent analyses.[4]

[3] These network measures are constructed only for students whose names appeared on the school roster (allowing them to be matched to friendship nominations from other students) and who attended schools with response rates of 50 percent or higher on the in-school questionnaire. Additionally, these measures are calculated only for those friendship nominations in which both the sender and receiver of the nomination are uniquely identifiable students (i.e., on a school roster) who completed an in-school questionnaire. Thus, nominated friends who could not be identified on the school roster or who did not attend the respondent's school are not included in the Add Health created network measures (Carolina Population Center 2001). These restrictions apply to the number of nominations received, centrality, extended network size, and mean GPA measures I use in this analysis. I do not apply these restrictions to the variables that I have created for total number of friends nominated, proportion of Wave IV friends with an incarcerated parent, and friends' average delinquency level.

[4] I exclude maternal incarceration from these analyses because the number of respondents affected by maternal incarceration prior to Wave I (N=232) is much smaller than the number who experience paternal incarceration prior to Wave I, and previous research suggests that maternal incarceration affects children differently than paternal incarceration (Lee, Fang, and Luo 2013). I exclude social parent incarceration

My final sample is restricted to longitudinal sample members who could be correctly matched to their Wave I in-school questionnaires and who participated in Wave IV, which collected data on parental incarceration history (N=11,682). I have created a subset of social network measures from the full Wave I in-school survey data (N=90,118) for all 11,682 respondents who meet these criteria. Additionally, I use social network measures created by Add Health for some of my analyses. Because Add Health only constructed these measures for students in schools with response rates of 50 percent or higher and for friendship nominations in which both the sender and receiver of the nomination are uniquely identifiable students, my sample size is further reduced to 10,926 when I use these Add Health network measures as my dependent variables (see Table A1 in the appendix).[5] I impute missing values for control variables but not for dependent variables or paternal incarceration, so my sample is further restricted to respondents who provided valid responses to questions about paternal incarceration history. This leaves me with a total of 11,411 respondents – 10,671 of whom were in schools for which Add Health calculated network measures – for analyses of network characteristics.[6]

For analyses of friend characteristics, the sample is further restricted to respondents who nominated at least one in school friend (N=9,452) so that friends' characteristics can be measured from their responses to the in-school survey. The sample size for the analyses of friends' average characteristics, therefore, depends upon how many respondents had at least one

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from these analyses because it is unclear how much of a role the social parent played in the respondent's life prior to Wave I and his/her incarceration.

[5] Approximately eight percent of all friendship nominations were to individuals whose names were not on the school rosters. Typically students were missing from school rosters because they had moved into the school system after the rosters were printed, but some nominations may not have been matched to the roster because students were known only by nicknames (Carolina Population Center 2001).

[6] I do not use Add Health's sample restriction criteria for the one network measure that I have created (total number of friends nominated), because it is not necessary to have a response rate of at least 50 percent from the student body to accurately identify the number of friends a respondent nominated. This restriction is important, however, for getting a reliable picture of the number of friendship nominations a respondent receives and for calculating measures of centrality and social location.

in-school friend who completed the survey and provided a valid response on that particular question (e.g., GPA, household composition, delinquent activities). Finally, it is only possible to calculate the proportion of a respondent's friends who have also had a parent incarcerated for respondents with at least one friend who participated in the Wave IV survey that collected data on parental incarceration (N=6,298). Therefore, estimates of the relationship between paternal incarceration and the proportion of friends with an incarcerated parent are less precise, because we can only discern parental incarceration history for the fraction of a respondent's friends, if any, who were also members of the longitudinal sample and participated in the Wave IV survey.

Measures

Dependent Variables: Network Characteristics

In order to assess if adolescents' social network structures differ by paternal incarceration history, I examine differences in the size of an adolescent's friend group and her social location within the whole school social network. The specific measures I use to document these differences are the total number of friends each respondent nominates, the number of students in her school who nominate her as a friend[7], the respondent's centrality within her school social network, and the size of her extended network within the school. Centrality is a measure of the respondent's prominence in the whole school social network – it is essentially a measure of the number of friends a respondent has, weighted by the popularity of those friends.[8] Because the

[7] Because the number of friendship nominations a respondent received is based off of surveys from other students in the respondent's school (who were present on the day of the survey), this measure is only calculated for respondents in schools that had at least a 50 percent response rate on the Wave I in-school survey.

[8] The particular measure of centrality I use is Bonacich centrality, which weights how many connections a respondent has (both the number of friends they nominate and the number of students who nominate them as friends) by the centrality of the friends that she's nominated (i.e., how many connections they have). Thus, this measure is premised upon the notion that "one's status is a function of the status of those one is connected to" (Bonacich 1987, 1181). In practical terms, this means that the "centrality" of a respondent is determined by the centrality (i.e., number of ties) of her ties.

scale of the centrality measure is not intuitive, I log each respondent's centrality score to make coefficients easier to interpret.[9] I gauge the size of a respondent's extended social network with a measure of how many students the respondent is connected to in three steps (i.e., friends of friends' friends).

Dependent Variables: Friend Characteristics

Additionally, I examine differences in the content of adolescents' social networks by paternal incarceration history with the following measures of friends' average characteristics: proportion of friends with an incarcerated parent[10], proportion from two parent households, mean GPA[11], and mean level of delinquent behavior[12]. These measures can only be calculated for friends who attended the same school as the respondent and completed the in-school survey.

Key Independent Variable: Father Incarcerated before Wave I

I use information on respondents' age at paternal incarceration and release to create an indicator variable identifying respondents whose biological father was incarcerated after their

[9] The Bonacich centrality score equals zero for respondents who do not nominate any friends and are not nominated by any other students as friends. To avoid losing these respondents when logging the centrality score, I add 1 to each respondent's centrality score before taking the natural log.

[10] This is the share of a respondent's Wave IV participant friends who had any parent figure incarcerated at some point after their birth and before their 18th birthday. It is calculated using only nominated friends who also participated in the Wave IV survey and for whom we know parental incarceration history. Therefore, the sample is restricted to respondents with at least one friend who also completed the Wave IV survey (N=6,298).

[11] Students reported their letter grade in English/Language Arts, Mathematics, History/Social Studies, and Science on the in-school survey. GPA was calculated as the mean grade across these four core subjects with grades weighted as follows: A = 4, B = 3, C = 2, D or F = 1. Subjects for which the student did not report a grade are dropped from the calculation of GPA.

[12] I created a delinquency index based upon respondents' and their friends' responses to questions about the frequency with which they engaged in the following 7 activities in the last 12 months: smoking cigarettes, drinking alcohol, getting drunk, engaging in dangerous activities on a dare, lying to parents, skipping school without an excuse, and getting in physical fights. I standardized responses for each activity across all 90,118 participants in the Wave I in school survey. I then calculated the mean of all valid responses across these seven activities and standardized it to create an index score for each of the respondents' friends with a mean of zero and a standard deviation of one. I then averaged these friend delinquency index scores across each respondent's friends to generate the mean delinquency index score among each respondent's in-school friends.

birth but prior to the first survey wave, in which network data were collected. This paternal incarceration indicator is the key independent variable in all of the analyses that follow.[13]

Control Variables

I first examine mean differences in network characteristics and friend characteristics between adolescents who have experienced paternal incarceration and those who have not. But in order to assess the extent to which any observed differences are simply the result of compositional differences in the types of children likely to experience paternal incarceration, I also conduct regression analyses using the following set of control variables: race, gender, age, number of years at the current school, GPA, delinquency index score, presence of mother and/or father figure in household, and parent education.

I measure respondent *race* with a series of five mutually exclusive dummy variables including white, black, Hispanic, Asian and other, based on response to the Wave I in-home survey. Respondents who selected two or more races were asked to identify the single race that best suited them. If they did not do so, their race was recorded as Other. Respondents who indicated a Hispanic background are classified as Hispanic, regardless of their racial background.[14] White is the reference category in regressions.

Gender is measured as a dummy variable set equal to one if the adolescent is male. *Age* at the time of the Wave I in-school survey is calculated by subtracting the date of in-school

[13] In an attempt to gauge whether social network characteristics differ more for adolescents with currently incarcerated parents than for adolescents who have ever experienced parental incarceration, I also created a dummy variable to identify adolescents who were likely to have had an incarcerated father at the time of the Wave I survey (based upon age at first parental incarceration, age at last release, and age at the time of the Wave I survey). The results using this measure are often slightly larger in magnitude but otherwise very similar to those reported below.

[14] I replaced missing race data from the Wave I in-home interviews with reported race from Wave I in-school questionnaires.

survey administration from the respondent's birth date.[15] Because previous research indicates that parental incarceration is associated with greater housing instability (Geller et al. 2009; Tasca, Rodriguez, and Zatz 2011), which may mean that children of incarcerated parents change schools more often than other children, and because students who are newer to a school have had less time to establish friendships, I also control for the student's self-reported number of *years in attendance at their current school*.

Additionally, because a respondent's own behavioral characteristics may confound the relationship between parental incarceration history and the behavioral characteristics of one's friends, I also control for respondent's own *GPA* and standardized *delinquency index score* to see if differences in social network characteristics between children of incarcerated fathers and their peers extend beyond differences in the behavioral characteristics of these two groups.

Finally, I also control for the presence of a mother and/or father figure in the respondent's household at the time of the Wave I survey and for the education level of the respondent's mother and father figures, when present in the household. Mother figure and father figure education levels are coded as a series of dummy variables for highest level of educational attainment: no school, less than high school, high school or GED, some college, college graduate, and more than college, with high school or GED completion omitted as the reference category.[16] Because not every student lives with a mother and/or father figure, I control for

[15] I use respondent reported gender and date of birth from the Wave IV survey as Add Health considers data from the last wave of participation to be the most correct ("Questions about Data — Add Health" 2014).

[16] Because student reports of parent education levels may be incorrect, I use reported education level from the in-home parent survey when possible. In most cases the parent survey was completed by the adolescent's resident mother; however other adults in the household sometimes completed the survey if the interviewer was unable to schedule an interview with the child's mother or father (Carolina Population Center 2008). The parent survey recorded the education level of the respondent and that of his or her spouse/partner, when applicable. I have recoded these education level variables into mother figure and father figure education based on the respondent's self-reported gendered relationship to the child

parental education in the following regression models by including mother's and father's education level interacted with the dummy variables indicating whether or not the student had a mother or father figure present in their household.

I multiply imputed missing values for years in current school (n=42), GPA (n=235), and delinquency index score (n=445) using respondents' data from the other control variables noted above.

Analytic Approach

I begin by examining mean differences in network characteristics and friend characteristics between adolescents who experienced paternal incarceration prior to Add Health Wave I and those who did not in order to get a sense of the extent to which social network structure and content do indeed differ for these two groups. Because many readers may wonder if any observed differences in mean characteristics are just the result of compositional differences between these two groups, however, I also employ OLS regression to help account for differences in racial composition, gender, age, years in current school, academic performance, delinquency, parents' presence in the household, and parent education between these groups.[17] I also include school fixed effects in these models since Add Health respondents are clustered within schools and because certain school-level characteristics of schools – like the

(e.g., biological mother, grandfather, etc.) and the gender of respondent parent's partner. Thus, the education level for any female respondent to the parent survey – or that of the female partner for a male respondent to the parent survey – is recorded as the education level of the child's "mother figure." When parents did not participate in the survey or did not report their level of education I fill in missing data with parent education level as reported by the student on the in-school survey. In cases where a respondent's biological parent lived in the same household as the respondent but did not complete the survey (and the biological parent's spouse did not complete it) I use student-reported parent education from the in-school survey.

[17] I also try Poisson regression models, rather than OLS, for the 3 network characteristics variables that are counts: total number of friends nominated, number of friend nominations received, and size of network reach in three steps. The results of these models are presented in the appendix rather than the main body of the text as the results they produce are qualitatively similar to those produced by the OLS models.

prevalence of parental incarceration or the diversity of the student body – may confound the relationship between parental incarceration and social network characteristics.

I run these models first on the full analytical sample, then separately for white, black and Hispanic adolescents. My goal in examining the relationship between paternal incarceration and social network outcomes separately by race is to see if the general pattern of these relationships appears to be qualitatively similar across racial categories or if it differs by race, as we might suspect given differential rates of parental incarceration across races. I also test the significance of these differences using race interactions in the full sample model.

These models are not intended to be causal, but by controlling for compositional differences between these two groups of adolescents we can get a sense of the extent to which any observed mean differences in network and friend characteristics result from anything more than differences in the basic characteristics of children who are likely to experience parental incarceration and those who are not.

Results

Descriptive Statistics

Table 1 provides an overview of control variable characteristics for members of the analytic sample, broken out by paternal incarceration history. Adolescents with incarcerated fathers and those without are closely matched on gender, presence of a mother figure in the household, and, to a lesser extent, age, years in current school, GPA and delinquency. There are notable differences, however, in the breakdown of race, parent education and, unsurprisingly, presence of a father figure in the household between these two groups. Black and Hispanic adolescents comprise a larger share of respondents who had a father incarcerated prior to Wave I. Respondents who had experienced paternal incarceration also have less educated mother and

father figures, on average, and are less likely to have a father figure present in their home than their peers (72 percent vs. 84 percent, respectively). Table A2 in the appendix illustrates differences in parental incarceration rates across gender, race, and parent education categories.

Table 1. Sample Member Control Variable Characteristics by Paternal Incarceration History

		Father Incarcerated before Wave I	
	All	No	Yes
Father incarcerated before Wave I	8.1%	--	100%
Gender			
Male	46.3%	46.3%	46.1%
Female	53.8%	53.7%	53.9%
Race			
White	54.5%	55.1%	47.5%
Black	22.6%	21.8%	31.6%
Hispanic	14.6%	14.5%	16.2%
Asian	6.5%	6.9%	2.5%
Other	1.8%	1.8%	2.3%
Age (mean)	14.9	15.0	14.8
	(1.7)	(1.7)	(1.6)
Years in current school (mean)	2.7	2.7	2.5
	(1.6)	(1.6)	(1.6)
GPA[1] (mean)	2.8	2.8	2.6
	(0.8)	(0.8)	(0.7)
Delinquency index score[1]	-0.04	-0.1	0.2
	(1.0)	(0.9)	(1.0)
Mother figure present in household	97.4%	97.4%	97.4%
Father figure present in household	82.7%	83.6%	72.0%
Mother figure's education			
No school	0.2%	0.2%	0.2%
Less than high school	15.0%	14.3%	21.4%
High school or GED	29.3%	29.1%	30.5%
Some college	29.2%	29.1%	31.1%
College graduate	15.3%	15.8%	10.6%
More than college	9.1%	9.6%	4.4%
Missing	2.0%	2.0%	1.8%
Father figure's education			
No school	0.2%	0.1%	0.3%
Less than high school	12.6%	12.1%	17.5%
High school or GED	23.8%	23.7%	24.8%

Some college		37.1%	36.3%	42.4%
College graduate		13.3%	14.0%	6.9%
More than college		10.1%	10.8%	4.3%
Missing		3.1%	3.0%	3.8%
	N	11,411	10,484	927

(Standard deviations in parentheses)
[1] Delinquency index score is standardized based on responses from all respondents to in-school survey, not just members of the longitudinal cohort included here.

These compositional differences between the set of students who have experienced paternal incarceration and those who have not are the reason that I employ regression models in the latter half of my analyses. By controlling for differences in these basic characteristics between the two groups, we can see if differences in social network structure and content appear to indicate anything more than mere differences in the types of adolescents likely to fall into each group.

Mean Differences

Table 2 displays mean network and friend characteristics for adolescents who experienced paternal incarceration prior to the Wave I survey and those who did not, along with the p-values from Wald tests for difference of estimated means. On the whole, the mean differences in Table 2 suggest that the social networks of adolescents who have had a father incarcerated differ significantly from those of other adolescents. Respondents who reported having an incarcerated father prior to Wave I nominate significantly fewer friends (about .4 fewer on average), are nominated by significantly fewer students in their school as friends (about .3 fewer on average), and are less connected to other students in their schools. They have significantly lower centrality scores (approximately 8 percent lower than those of students who have not had a father incarcerated), indicating that their friends are less well-connected than the average student's friends. Adolescents who have experienced paternal incarceration also have

smaller extended networks than their peers – they are able to reach about 7 fewer students in three steps than are their peers who have not experienced paternal incarceration.

Table 2. Mean Differences in Network and Friend Characteristics by Paternal Incarceration

	Father Incarcerated before Wave I			
	No	Yes	Difference	p-value
Network Characteristics				
No. friends nominated	6.88	6.45	-0.43	0.00
	(3.46)	(3.63)		
No. friend nominations received	4.49	4.15	-0.33	0.01
	(3.7)	(3.36)		
Centrality (log)	0.54	0.46	-0.08	0.00
	(0.35)	(0.34)		
Network reach in 3 steps	57.88	50.77	-7.12	0.00
	(47.8)	(47.0)		
Friend Characteristics				
Prop. Wave IV friends with incarcerated parent	0.1	0.15	0.05	0.00
	(0.24)	(0.29)		
Prop. friends in two parent households	0.73	0.65	-0.09	0.00
	(0.27)	(0.29)		
Mean GPA	2.83	2.65	-0.18	0.00
	(0.51)	(0.48)		
Mean delinquency index score	-0.03	0.1	0.14	0.00
	(0.61)	(0.69)		

Standard deviations in parentheses.

Based on the simple comparison of means in Table 2, adolescents with incarcerated fathers also appear to have less advantaged, less academically successful, and more delinquent friends, on average, than other adolescents. A significantly higher proportion of their friends have incarcerated parents (about 5 percent more, on average), and a significantly lower share of their friends live in two-parent households (9 percent fewer, on average). Moreover, friends' mean GPA is significantly lower (by about .2 points) and friends' average delinquency scores are significantly higher (by about .1 standard deviations) among adolescents who have experienced paternal incarceration.

Overall, the mean differences reported in Table 2 suggest that adolescents have experienced paternal incarceration are indeed more socially isolated than other adolescents and are connected to less advantageous friends, on average, than other adolescents who have not experienced paternal incarceration. These findings lend support to the notion that children of incarcerated parents may be stigmatized, causing them to be more socially isolated than other children and more connected to other marginalized youth.

Regression Results

Table 3 displays the regression coefficients, standard errors, and sample sizes from the OLS regressions of network and friend characteristics on paternal incarceration history. Only the coefficients on the incarcerated father indicator variable are displayed here. For full tables with coefficients and standard errors for control variables see Table A3 in the appendix.

The coefficients in this table represent the residual differences in network and friend characteristics between adolescents who experienced paternal incarceration and those who did not – within the same school – after controlling for differences in respondent race, gender, age, years in current school, academic performance, delinquency, parents' presence in the household, and parental education between these two groups. All of the mean differences are cut in at least half when we control for these compositional differences and compare students within the same school. Most of the differences in network and friend characteristics between these two groups remain statistically significant, however, indicating that compositional differences do not fully explain the differences observed in Table 2.

Examining the coefficients for the full analytical sample in the first column, we see that adolescents who experienced paternal incarceration nominated .2 fewer friends on average than other adolescents once we include controls, which is roughly equivalent to the difference

between adolescents whose mother figure did not complete high school and those whose mother figure did (see Table A3 in the appendix). Similarly, differences in social location and connectedness within the school are smaller but remain statistically significant. Adolescents who have experienced paternal incarceration have centrality scores that are about 3.5 percent lower than those of their peers, and their extended networks (in three steps) contain about 3 fewer students, on average.[18] To help put the magnitude of these differences in context, the difference in centrality scores is roughly equivalent to the difference between boys and girls, and the difference in extended network reach is approximately equal to the difference associated with a one standard deviation increase in delinquency. The number of nominations received, while still lower for adolescents whose father has been incarcerated, is no longer statistically significant, dropping to a difference of less than .09 nominations, once we account for compositional differences between these two groups.

With regard to friend characteristics, the difference in proportion of Wave IV friends with an incarcerated parent is no longer statistically significant once we account for compositional differences in the two groups and restrict comparison to within schools. Significant differences remain in the share of friends living in two-parent household, friends' mean GPA, and delinquency level of friends, though. The share of an adolescents' friends from two parent households is 4 percent lower, on average, for adolescents who have experienced paternal incarceration, a difference that is roughly matched by the difference we see between adolescents who are missing either a mother figure or a father figure in their own household. Additionally, their friends have lower GPAs (by .7 points, on average) and are more delinquent than other

[18] Table A5 in the appendix presents the results from Poisson regressions of number of friend nominations received and size of extended network in three steps, as well as right censored Poisson regressions of total number of friends nominated (which is capped at 10) on paternal incarceration. The results of these models are qualitatively similar to those of the OLS models, so I do not report their results here.

adolescent's friends. The difference in friend's average delinquency (.07 standard deviations) is roughly three times as large as the difference in friends' average delinquency between boys and girls. On the whole, these differences generally confirm the above stated expectations that children who experience parental incarceration will be more socially isolated and have more marginalized and more delinquent friends than their peers.

Table 3. Coefficients from Regression of Social Network and Friend Characteristics on Paternal Incarceration by Race

	All	Whites	Blacks	Hispanics
Network Characteristics				
No. of friends nominated	-0.200*	-0.204	-0.398*	-0.155
(std error)	-0.114	(0.154)	(0.225)	(0.317)
N	11,411	6,214	2,580	1,670
No. of friend nominations received	-0.085	-0.102	-0.295	0.215
(std error)	(0.126)	(0.200)	(0.207)	(0.267)
N	10,671	5,835	2,427	1,512
Centrality (log)	-0.035***	-0.0318*	-0.0358	-0.0334
(std error)	(.0122)	(0.0169)	(0.0220)	(0.0348)
N	10,671	5,835	2,427	1,512
Network reach in 3 steps	-3.209**	-3.584	-2.110	-2.504
(std error)	(1.431)	(2.191)	(2.585)	(3.261)
N	10,671	5,835	2,427	1,512
Friend Characteristics				
Prop. Wave IV friends with incarcerated parent	0.00718	0.0149	0.00334	-0.0715*
(std error)	(0.0118)	(0.0151)	(0.0268)	(0.0370)
N	6,298	3,646	1,321	791
Prop. friends in two parent households	-0.0395***	-0.0416***	-0.0361*	-0.0115
(std error)	(0.00951)	(0.0118)	(0.0219)	(0.0287)
N	9,452	5,448	1,973	1,261
Mean GPA	-0.0682***	-0.106***	-0.0104	-0.0490
(std error)	(0.0152)	(0.0213)	(0.0282)	(0.0414)
N	10,172	5,656	2,257	1,413
Mean delinquency index score	0.0749***	0.0904***	0.0179	0.161**
(std error)	(0.0217)	(0.0295)	(0.0391)	(0.0663)
N	9,407	5,442	1,960	1,241

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

When we look at these relationships separately for white, black and Hispanic adolescents, we see some differences, but the story remains largely the same. Though the magnitudes vary

slightly, paternal incarceration is negatively associated with number of friends nominated, centrality, extended network size, proportion of friends from two parent households, and friends' mean GPA. Meanwhile, it is positively correlated with the average delinquency of an adolescent's friends.[19]

There are some noticeable exceptions, however. With regard to number of friend nominations received, paternal incarceration is positively associated with this outcome for Hispanics, but negatively associated with it for whites and blacks. None of these differences are statistically significant, however, for any of the racial groups or for the analytical sample as a whole. There also appears to be a significant negative relationship between paternal incarceration and the proportion of an adolescents' friends who have also experienced parental incarceration for Hispanic youth, but given the relatively small size of the Hispanic subsample and the absence of a plausible intuitive explanation for why Hispanic youth with incarcerated fathers would be *less* likely to be friends with other adolescents with incarcerated fathers, this may just be an artifact of doing multiple comparisons.

Perhaps the most notable difference between racial groups is that, while paternal incarceration is significantly negatively associated with number of friends nominated and appears to be negatively correlated with centrality for blacks (similar to the story for whites and, to a lesser extent, Hispanics), paternal incarceration does not appear to be strongly related to friends' behaviors for blacks. The coefficients for friends' mean GPA and delinquency index score go in the same direction for black adolescents as for white and Hispanic youth, but the black coefficients are close to zero. While paternal incarceration is associated with having

[19] It is important to note that, because there are far fewer black and Hispanic respondents than white respondents, the standard errors are larger across the board in the black and Hispanic regressions. As a result, statistical significance is harder to achieve in the black and Hispanic models. However, we can still compare the signs and magnitudes of the coefficients to get a sense of the extent to which the story found above appears to hold across races.

friends with a mean GPA .1 points lower, on average, than other adolescents' friends, the coefficient is about half as small for Hispanics, and is only -.01 for blacks. The difference in the relationship between paternal incarceration and friends' academic achievement is in fact significantly different for blacks versus whites (see Table A4 in the appendix). The only other racial difference that appears to be statistically significant is that between whites and Hispanics on the association between paternal incarceration and proportion of friends from two-parent households. While having an incarcerated father is associated (significantly) with having about 4 percent fewer of one's friends come from two-parent homes for both whites and blacks, this relationship is much smaller and is not significant for Hispanic adolescents.

A common story emerges about the social networks of adolescents who have experienced paternal incarceration. On average, these children appear to be more socially isolated than their peers: they nominate fewer friends, are more peripheral in their school social network, and have smaller extended networks than other adolescents who have not experience paternal incarceration. Moreover, they have more disadvantaged friends than other adolescents. A significantly smaller share of their friends comes from two-parent households, and their friends are less academically successful and more delinquent, on average, than other adolescents' friends.

Finally, it is worth noting that we might see even larger differences in friend characteristics between children with incarcerated fathers and those without if the Add Health sample were not restricted to adolescents who were enrolled in school in the 1994-95 school year. Previous research suggests that children of incarcerated parents are more likely to drop out of school than other adolescents (Cho 2011), so the dropouts who are excluded from this analysis are likely to be disproportionately children of incarcerated parents. To the extent that dropouts

may be more likely to have lower achieving, more delinquent friends than adolescents who do not drop out of school, the average differences in friend characteristics based on paternal incarceration reported here may underreport the true mean differences in friend characteristics between these two groups in the population as a whole.

Discussion

Previous research has highlighted the emotional and behavioral impacts of parental incarceration, as well as the housing instability, poor health and low academic achievement that often accompany parental incarceration for children. We have almost no understanding of the social experiences of children with incarcerated parents, however. Using social network data from the National Longitudinal Study of Adolescent Health, this paper examines how the social networks of adolescents who experience paternal incarceration compare to those of other American adolescents in terms of both structure and content. My results indicate that, on average, children of incarcerated fathers are more socially isolated than other adolescents and have fewer friends who are more disadvantaged (coming less often from two parent homes), less academically successful, and more delinquent than the friends of other adolescents. Notably, I find that differences in friends' academic achievement and delinquency based on paternal incarceration may not hold for black adolescents, although they look similar to white and Hispanic adolescents in terms of network characteristic differences.

These findings provide further indication of the great variety of ways in which children who experience parental incarceration are disadvantaged. Moreover, they give further credence to the hypothesis that parental incarceration is a stigmatizing event in the lives of American children. While this study cannot directly test the extent to which adolescents with incarcerated parents are stigmatized, my finding that children who have experienced parental incarceration

have fewer friends, are less connected to their schoolmates, and have more disadvantaged, less academically successful, and more delinquent friends suggests that children of incarcerated parents may be stigmatized by their peers. Moreover, the smaller, non-significant differences in friends' academic achievement and delinquency for black adolescents may suggest that parental incarceration is less stigmatizing for black children, who experience parental incarceration at much higher rates, than it is for white children.

These findings may also shed light on previous research indicating that children of incarcerated parents have higher levels of delinquency and lower academic achievement than other adolescents. Given that we know both academic achievement and delinquency are influenced by friends (Kandel 1978; Vitaro et al. 1997; Vitaro, Brendgen, and Tremblay 2000; Haynie 2002; Weerman and Smeenk 2005; Flashman 2014), this paper suggests that at least part of the reason we see higher levels of delinquency and lower achievement among children of incarcerated parents may be the types of friends with whom they associate. In general, adolescents who experience paternal incarceration have more delinquent and lower achieving friends than other adolescents even after we control for their own achievement and delinquency. Thus, it may be that these adolescents have little choice but to associate with more delinquent and lower achieving peers than we would expect them to based on their own achievement and delinquency, and these peers in turn further encourage their delinquency and discourage their achievement. Further research that can tease out the extent to which delinquent and low achieving friends precede delinquent activity and low achievement for children of incarcerated parents would be helpful for verifying – or rejecting – this proposition.

Future research should also try to discern whether smaller, more isolated friendship networks and more disadvantaged friends are simply the social manifestation of the general

disadvantage brought on by parental incarceration or if they truly are the result of social stigma surrounding parental incarceration in the US. Moreover, it would be helpful to explore the extent to which disadvantaged social networks are a mechanism through which parental incarceration affects subsequent outcomes like health, behavior, and academic achievement and/or if network and friend characteristics are moderating factors that exacerbate – or diminish – the apparently negative effects of parental incarceration.

In addition to the importance of friendship networks in adolescence for providing social support and exposing children to or protecting them from disadvantageous peers, we know that social networks continue to matter throughout life course. Adult social networks are important for providing information about and referrals for job openings (Granovetter 1973; Smith 2007), as well as emotional support and financial assistance (Stack 1983; Ellison and George 1994). To the extent that children with incarcerated parents are more likely to align themselves with less successful peers, their networks may be less instrumental in helping them achieve self-sufficiency and successfully transition into adulthood than the networks of other adolescents with more pro-social peers.

From a policy-oriented perspective, how can we minimize the negative effects of the disadvantaged social networks in which children of incarcerated parents are embedded and prevent the intergenerational transmission of disadvantage? In light of previous findings indicating that parents have at least as much influence on adolescent educational aspirations as peers (Kandel and Lesser 1969; Davies and Kandel 1981) and that stronger family support weakens the influence of delinquent peers (Poole and Regoli 1979), programs that strengthen the relationship between custodial parents, or guardians, and children with an incarcerated parent may be able to lessen the potentially detrimental influence of low achieving and delinquent

friends. It may also be worth considering the utility of mentoring programs that could provide children of incarcerated parents with greater adult support and guidance that might, at the very least, reduce the amount of time they are exposed to potentially negative peer influence and, at best, discourage delinquency and encourage high academic achievement. Additionally, given that job seekers often learn about job openings through their social networks, we might worry about the extent to which the social networks available to the children of incarcerated parents can connect them to decent jobs as they transition into adulthood. Thus, it may be beneficial to target children of incarcerated parents for summer jobs programs or programs like Job Corps that can help them gain employment experience and make connections that can help them find work in the future.

It is important to note, however, that the findings in this paper suggest that the above proposed interventions might be less necessary and, thus, less useful for black adolescents affected by parental incarceration. Based on the above analyses, it appears that, like white and Hispanic youth, black adolescents who have experienced paternal incarceration are more socially isolated than other adolescents, but their friends may not be unusually delinquent or low achieving compared to otherwise similar adolescents' friends. Thus, programs focused on providing pro-social relationships and job opportunities for black children with incarcerated parents may be less necessary than programs that can help these children overcome social isolation. It is important to recognize, however, that the reason we do not see strong differences in friends' achievement and delinquency for black adolescents with incarcerated fathers may be because paternal incarceration is so prevalent in the African American community that it does not carry enough of a stigma to limit potential friend options. lower That does not mean that black children with incarcerated parents are less deserving of interventions, though. Instead, the

more critical need for these children may be interventions that can address the systemic inequalities that have caused black Americans to be so overrepresented in the American prisons and jails and the pitfalls that come with living in communities under heavy surveillance by the criminal justice system (A. Goffman 2014).

This paper marks an important first step toward understanding how parental incarceration is manifested in the social lives of American children. These findings make clear that, in addition to facing disadvantage in many other aspects of their lives, children who experience paternal incarceration are also socially disadvantaged. By shedding light on the smaller, less advantageous friendship networks in which children of incarcerated parents are embedded, this paper enriches our understanding of the broad variety of ways in which both inmates and their children are marginalized in American society.

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Appendix

Table A1. Analytical Sample

		Wave I In-School Survey Respondents	
		Total	With Add Health Network Measures
		90,118	75,871
Wave I In-Home Respondents (Longitudinal Sample Members)	20,745	15,356	14,317
Wave IV Survey Participants	15,701	11,682	10,926
With valid data on paternal incarceration	15,320	**11,411**	**10,671**
With at least one *in school* friend		**9,452**	**9,018**

Table A2. Distribution of Paternal Incarceration Rates by Respondent Characteristics

	% with Incarcerated Father (before Wave I)
Full Sample	**8.1%**
Gender	
Male	8.1%
Female	8.2%
Race	
White	7.1%
Black	11.4%
Hispanic	9.0%
Asian	3.1%
Other	10.2%
Mother Figure's Education	
No school	10.5%
Less than high school	11.7%
High school or GED	8.5%
Some college	8.6%
College graduate	5.6%
More than college	3.9%
Missing	7.7%
Father Figure's Education	
No school	18.8%
Less than high school	11.3%
High school or GED	8.5%

Some college	9.4%
College graduate	4.2%
More than college	3.4%
Missing	10.1%
Household Composition	
Mother figure in household	8.1%
No mother figure in household	8.1%
Father figure in household	7.1%
No father figure in household	13.1%

Table A3. Full Regressions of Social Network and Friend Characteristics on Paternal Incarceration History with Controls and School Fixed Effects

	Network Characteristics				Friend Characteristics			
	No. friends nominated	No. friend nominations received	Centrality (log)	Network reach in 3 steps	Prop. Wave IV friends with incarcerated parent	Prop. friends in two parent homes	Mean GPA	Mean delinquency index score
Father incarcerated before Wave I	-0.200*	-0.0847	-0.0346***	-3.209**	0.00718	-0.0395***	-0.0682***	0.0749***
	(0.114)	(0.126)	(0.0122)	(1.431)	(0.0118)	(0.00951)	(0.0152)	(0.0217)
Black	-0.704***	-0.453***	-0.130***	-13.24***	0.0643***	-0.203***	-0.182***	-0.134***
	(0.107)	(0.120)	(0.0116)	(1.366)	(0.0112)	(0.00892)	(0.0144)	(0.0204)
Hispanic	-0.265**	0.218	-0.0290**	-2.817*	0.00627	-0.00833	-0.0591***	0.0167
	(0.123)	(0.139)	(0.0134)	(1.577)	(0.0135)	(0.0103)	(0.0167)	(0.0237)
Asian	-0.347**	-0.154	-0.0310*	-6.923***	-0.0248	0.00629	0.165***	-0.150***
	(0.154)	(0.171)	(0.0165)	(1.938)	(0.0158)	(0.0127)	(0.0205)	(0.0290)
Other Race/Ethnicity	-0.339	0.0556	-0.0540**	-5.052*	0.0723***	-0.0605***	-0.0670**	-0.00295
	(0.239)	(0.266)	(0.0256)	(3.018)	(0.0247)	(0.0197)	(0.0318)	(0.0452)
Male	-1.234***	-0.350***	-0.0414***	-2.560***	-0.0151**	0.0115**	0.0112	-0.0213*
	(0.0630)	(0.0698)	(0.00673)	(0.792)	(0.00637)	(0.00517)	(0.00835)	(0.0118)
Age	-0.161***	-0.186***	-0.0408***	-5.305***	-0.00196	-0.00404*	0.00133	0.0429***
	(0.0287)	(0.0321)	(0.00309)	(0.364)	(0.00279)	(0.00235)	(0.00386)	(0.00538)
Years in current school	0.116***	0.212***	0.0237***	1.386***	-0.00468*	0.00367*	0.00542	0.00613
	(0.0267)	(0.0298)	(0.00288)	(0.340)	(0.00254)	(0.00217)	(0.00358)	(0.00496)
GPA	0.399***	0.553***	0.0559***	4.202***	-0.0192***	0.0211***	0.180***	-0.0985***
	(0.0462)	(0.0511)	(0.00495)	(0.581)	(0.00471)	(0.00380)	(0.00619)	(0.00867)
Delinquency Index score	0.155***	0.161***	-0.0199***	-3.038***	0.0135***	-0.0144***	-0.0505***	0.188***
	(0.0350)	(0.0385)	(0.00373)	(0.438)	(0.00374)	(0.00301)	(0.00465)	(0.00695)
Mother figure present in household	0.667***	0.512**	0.0790***	7.809***	-0.00624	0.0494***	-0.00639	0.00248
	(0.200)	(0.223)	(0.0215)	(2.527)	(0.0216)	(0.0175)	(0.0272)	(0.0401)
Father figure present in household	0.0901	0.170	0.0189*	1.957	-0.0292***	0.0342***	0.00965	-0.0181
	(0.101)	(0.112)	(0.0108)	(1.271)	(0.0103)	(0.00834)	(0.0134)	(0.0191)
Mother Figure Education (if present)								
No school*Mother figure in household	-0.308	0.0413	-0.0370	-10.25	0.213***	0.165***	-0.244**	0.152
	(0.764)	(0.822)	(0.0793)	(9.334)	(0.0818)	(0.0639)	(0.0982)	(0.150)

Less than high school*Mother figure in household	-0.256**	-0.212*	-0.0312***	-4.158***	-0.000727	-0.000376	-0.0275**	0.0249
	(0.105)	(0.116)	(0.0112)	(1.320)	(0.0106)	(0.00870)	(0.0140)	(0.0199)
Some college*Mother figure in household	0.184**	0.109	0.0137	0.908	-0.00921	0.00472	0.0264**	0.000595
	(0.0833)	(0.0923)	(0.00890)	(1.048)	(0.00830)	(0.00677)	(0.0110)	(0.0155)
College graduate*Mother figure in household	0.0867	0.320***	0.0192*	1.267	-0.00754	0.0188**	0.0673***	-0.0389**
	(0.104)	(0.116)	(0.0111)	(1.312)	(0.0104)	(0.00847)	(0.0138)	(0.0193)
More than college*Mother figure in household	0.306**	0.551***	0.0501***	4.495***	-0.0310**	0.0263**	0.116***	-0.0389
	(0.131)	(0.145)	(0.0140)	(1.645)	(0.0131)	(0.0105)	(0.0173)	(0.0240)
Father Figure Education (if present)								
No school*Father figure in household	-2.464***	-2.113**	-0.191**	-18.15*	0.113	0.00906	-0.0455	0.0213
	(0.834)	(0.956)	(0.0921)	(10.85)	(0.101)	(0.0829)	(0.125)	(0.198)
Less than high school*Father figure in household	-0.0652	-0.319**	-0.0144	-0.885	0.0191*	-0.0132	-0.0667***	0.0279
	(0.114)	(0.125)	(0.0121)	(1.423)	(0.0113)	(0.00932)	(0.0150)	(0.0213)
Some college*Father figure in household	0.000961	-0.0751	0.00467	0.863	0.00790	-0.00644	0.0285**	0.00198
	(0.0932)	(0.103)	(0.00992)	(1.169)	(0.00931)	(0.00756)	(0.0123)	(0.0173)
College graduate*Father figure in household	0.0499	0.275**	0.0310***	1.521	0.00321	0.00714	0.0536***	-0.0187
	(0.112)	(0.124)	(0.0120)	(1.411)	(0.0111)	(0.00902)	(0.0148)	(0.0206)
More than college*Father figure in household	-0.0268	0.0548	0.0168	0.197	0.0152	0.0123	0.0717***	-0.0178
	(0.131)	(0.146)	(0.0141)	(1.656)	(0.0131)	(0.0105)	(0.0173)	(0.0240)
Observations	11,411	10,671	10,671	10,671	6,298	9,452	10,172	9,407
Number of schools	133	121	121	121	128	132	121	132

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4. Regressions of Social Network and Friend Characteristics on Paternal Incarceration with Race Interactions (White, Black & Hispanic Respondents Only)

	Network Characteristics				Friend Characteristics			
	No. friends nominated	No. friend nominations received	Centrality (log)	Network reach in 3 steps	Prop. Wave IV friends with incarcerated parent	Prop. friends in two parent homes	Mean GPA	Mean delinquency index score
Father incarcerated before Wave I	-0.170	-0.172	-0.0340*	-3.525*	0.0148	-0.0415***	-0.114***	0.0950***
	(0.163)	(0.184)	(0.0175)	(2.099)	(0.0162)	(0.0132)	(0.0218)	(0.0299)
Black*Father incarcerated before Wave I	-0.179	-0.0655	0.00575	2.126	-0.00487	-0.00594	0.112***	-0.0752
	(0.259)	(0.290)	(0.0275)	(3.313)	(0.0276)	(0.0223)	(0.0348)	(0.0505)
Hispanic*Father incarcerated before Wave I	0.0154	0.428	-0.00822	-0.329	-0.0535	0.0504*	0.0651	0.0586
	(0.323)	(0.365)	(0.0347)	(4.168)	(0.0376)	(0.0278)	(0.0431)	(0.0633)
Black	-0.713***	-0.391***	-0.131***	-13.91***	0.0625***	-0.205***	-0.189***	-0.132***
	(0.112)	(0.128)	(0.0121)	(1.456)	(0.0119)	(0.00939)	(0.0151)	(0.0214)
Hispanic	-0.223*	0.252*	-0.0199	-2.232	0.00559	-0.0198*	-0.0555***	0.0123
	(0.130)	(0.148)	(0.0140)	(1.689)	(0.0143)	(0.0109)	(0.0177)	(0.0249)
Male	-1.287***	-0.332***	-0.0462***	-3.020***	-0.0163**	0.0122**	0.0131	-0.0257**
	(0.0656)	(0.0737)	(0.00700)	(0.841)	(0.00677)	(0.00542)	(0.00872)	(0.0123)
Age	-0.175***	-0.195***	-0.0421***	-5.499***	-0.00184	-0.00364	-0.00187	0.0459***
	(0.0297)	(0.0337)	(0.00320)	(0.385)	(0.00293)	(0.00245)	(0.00400)	(0.00558)
Years in current school	0.123***	0.223***	0.0250***	1.487***	-0.00329	0.00266	0.00447	0.00457
	(0.0275)	(0.0310)	(0.00295)	(0.355)	(0.00264)	(0.00224)	(0.00366)	(0.00509)
GPA	0.406***	0.575***	0.0566***	4.378***	-0.0176***	0.0190***	0.176***	-0.0938***
	(0.0482)	(0.0540)	(0.00515)	(0.618)	(0.00500)	(0.00399)	(0.00649)	(0.00903)
Delinquency Index score	0.158***	0.171***	-0.0191***	-3.131***	0.0124***	-0.0146***	-0.0478***	0.183***
	(0.0361)	(0.0401)	(0.00384)	(0.460)	(0.00392)	(0.00314)	(0.00476)	(0.00711)
Mother figure present in household	0.528**	0.559**	0.0678***	7.629***	-0.00280	0.0531***	-0.00322	-0.0116
	(0.213)	(0.239)	(0.0227)	(2.731)	(0.0230)	(0.0185)	(0.0289)	(0.0422)

Father figure present in household	0.0717	0.155	0.0144	1.534	-0.0320***	0.0365***	0.0103	-0.0181
	(0.104)	(0.117)	(0.0111)	(1.335)	(0.0108)	(0.00864)	(0.0139)	(0.0197)
Mother Figure Education (if present)								
No school*Mother figure in household	-0.233	0.346	0.0488	-9.226	0.0102	0.153**	-0.126	0.0887
	(0.893)	(0.974)	(0.0924)	(11.12)	(0.101)	(0.0754)	(0.116)	(0.178)
Less than high school*Mother figure in household	-0.233**	-0.144	-0.0283**	-4.643***	-0.00475	-0.00274	-0.0264*	0.0208
	(0.109)	(0.122)	(0.0116)	(1.390)	(0.0111)	(0.00905)	(0.0145)	(0.0206)
Some college*Mother figure in household	0.199**	0.114	0.0145	1.037	-0.0106	0.00405	0.0279**	-0.000795
	(0.0857)	(0.0961)	(0.00912)	(1.097)	(0.00867)	(0.00699)	(0.0113)	(0.0159)
College graduate*Mother figure in household	0.0684	0.300**	0.0137	1.063	-0.00351	0.0241***	0.0742***	-0.0352*
	(0.109)	(0.123)	(0.0117)	(1.403)	(0.0111)	(0.00895)	(0.0145)	(0.0203)
More than college*Mother figure in household	0.254*	0.500***	0.0441***	3.812**	-0.0317**	0.0278**	0.120***	-0.0408
	(0.137)	(0.154)	(0.0146)	(1.755)	(0.0140)	(0.0111)	(0.0181)	(0.0253)
Father Figure Education (if present)								
No school*Father figure in household	-2.746***	-2.128**	-0.219**	-19.78*	0.138	0.0133	-0.130	0.000753
	(0.895)	(1.050)	(0.0997)	(11.99)	(0.112)	(0.0889)	(0.131)	(0.212)
Less than high school*Father figure in household	-0.0600	-0.308**	-0.0122	-0.232	0.0187	-0.0134	-0.0669***	0.0318
	(0.117)	(0.130)	(0.0124)	(1.489)	(0.0118)	(0.00963)	(0.0154)	(0.0220)
Some college*Father figure in household	-0.0199	-0.0423	0.00367	1.064	0.0100	-0.00416	0.0238*	0.00215
	(0.0965)	(0.108)	(0.0102)	(1.232)	(0.00979)	(0.00787)	(0.0127)	(0.0179)
College graduate*Father figure in household	0.0383	0.267**	0.0315**	1.511	0.00575	0.00846	0.0544***	-0.0211
	(0.117)	(0.132)	(0.0125)	(1.501)	(0.0118)	(0.00948)	(0.0155)	(0.0215)
More than college*Father figure in household	-0.0841	0.112	0.0135	-0.265	0.0179	0.0118	0.0679***	-0.0200
	(0.137)	(0.155)	(0.0147)	(1.770)	(0.0139)	(0.0111)	(0.0182)	(0.0252)
Constant	8.244***	4.678***	0.903***	120.9***	0.218***	0.674***	2.326***	-0.364***
	(0.495)	(0.557)	(0.0529)	(6.361)	(0.0498)	(0.0411)	(0.0664)	(0.0934)
Observations	10,464	9,774	9,774	9,774	5,758	8,682	9,326	8,643
Number of schools	133	121	121	121	128	132	121	132

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table A5. Coefficients from Poisson and Right-Censored Poisson Models of Count Network Characteristics

	All Respondents			Interactions with Race (White, Black & Hispanic Respondents only)		
	No. friends nominated	No. friend nominations received	Network reach in 3 steps	No. friends nominated	No. friend nominations received	Network reach in 3 steps
Father incarcerated before Wave I	-0.0367*	-0.0197	-0.0582***	-0.0304	-0.0340	-0.0494***
	(0.0212)	(0.0178)	(0.00507)	(0.0242)	(0.0245)	(0.00668)
Black*Father incarcerated before Wave I				-0.0383	-0.0381	0.0136
				(0.0471)	(0.0422)	(0.0118)
Hispanic*Father incarcerated before Wave I				0.00552	0.0940*	-0.0556***
				(0.0735)	(0.0502)	(0.0158)
Black	-0.123***	-0.107***	-0.237***	-0.124***	-0.0915***	-0.246***
	(0.0220)	(0.0170)	(0.00478)	(0.0211)	(0.0178)	(0.00501)
Hispanic	-0.0508*	0.0588***	-0.0348***	-0.0414*	0.0687***	-0.0148**
	(0.0266)	(0.0193)	(0.00557)	(0.0250)	(0.0205)	(0.00584)
Asian	-0.0728	-0.0162	-0.102***			
	(0.0616)	(0.0249)	(0.00748)			
Other Race/Ethnicity	-0.0492	0.0208	-0.0738***			
	(0.0473)	(0.0358)	(0.0105)			
Male	-0.218***	-0.0785***	-0.0428***	-0.228***	-0.0733***	-0.0496***
	(0.0144)	(0.00956)	(0.00269)	(0.0165)	(0.00995)	(0.00277)
Age	-0.0269***	-0.0392***	-0.0936***	-0.0293***	-0.0408***	-0.0949***
	(0.00670)	(0.00431)	(0.00128)	(0.00680)	(0.00446)	(0.00132)
Years in current school	0.0202***	0.0440***	0.0269***	0.0214***	0.0462***	0.0287***
	(0.00442)	(0.00391)	(0.00126)	(0.00475)	(0.00401)	(0.00129)
GPA	0.0743***	0.126***	0.0706***	0.0758***	0.130***	0.0719***
	(0.0100)	(0.00721)	(0.00231)	(0.00985)	(0.00752)	(0.00240)
Delinquency Index score	0.0340***	0.0375***	-0.0546***	0.0347***	0.0393***	-0.0548***
	(0.00730)	(0.00542)	(0.00203)	(0.00787)	(0.00555)	(0.00212)
Mother figure present in household	0.127**	0.142***	0.173***	0.0974**	0.152***	0.161***

	(0.0526)	(0.0337)	(0.00972)	(0.0452)	(0.0358)	(0.0101)
Father figure present in household	0.0181	0.0410***	0.0406***	0.0153	0.0372**	0.0322***
	(0.0175)	(0.0156)	(0.00440)	(0.0183)	(0.0161)	(0.00451)
Mother Figure Education (if present)						
No school*Mother figure in household	-0.0664	0.000776	-0.296***	-0.0371	0.0838	-0.271***
	(0.166)	(0.124)	(0.0432)	(0.233)	(0.140)	(0.0499)
Less than high school*Mother figure in household	-0.0492**	-0.0550***	-0.0715***	-0.0452**	-0.0372**	-0.0792***
	(0.0199)	(0.0165)	(0.00466)	(0.0226)	(0.0171)	(0.00481)
Some college*Mother figure in household	0.0305**	0.0219*	0.0139***	0.0334**	0.0228*	0.0148***
	(0.0153)	(0.0125)	(0.00344)	(0.0159)	(0.0128)	(0.00352)
College graduate*Mother figure in household	0.0128	0.0669***	0.0189***	0.00895	0.0606***	0.0139***
	(0.0218)	(0.0154)	(0.00435)	(0.0244)	(0.0161)	(0.00449)
More than college*Mother figure in household	0.0575**	0.114***	0.0716***	0.0484*	0.100***	0.0575***
	(0.0263)	(0.0190)	(0.00536)	(0.0258)	(0.0199)	(0.00558)
Father Figure Education (if present)						
No school*Father figure in household	-0.535**	-0.662***	-0.494***	-0.611**	-0.624***	-0.499***
	(0.244)	(0.182)	(0.0516)	(0.298)	(0.190)	(0.0551)
Less than high school*Father figure in household	-0.00987	-0.0735***	-0.0122**	-0.00897	-0.0706***	-0.000205
	(0.0213)	(0.0176)	(0.00487)	(0.0194)	(0.0181)	(0.00497)
Some college*Father figure in household	0.000506	-0.0177	0.0101***	-0.00266	-0.0110	0.0122***
	(0.0166)	(0.0139)	(0.00382)	(0.0178)	(0.0143)	(0.00391)
College graduate*Father figure in household	0.00738	0.0553***	0.0240***	0.00555	0.0517***	0.0223***
	(0.0172)	(0.0163)	(0.00460)	(0.0182)	(0.0170)	(0.00475)
More than college*Father figure in household	-0.00811	0.00961	-0.000617	-0.0182	0.0206	-0.0102*
	(0.0221)	(0.0193)	(0.00545)	(0.0221)	(0.0202)	(0.00568)
Observations	11,411	10,668	10,668	10,464	9,771	9,771
Number of schools	132	118	118	321	118	118

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1