Volume Title: Controlling Crime: Strategies and Tradeoffs

Volume Author/Editor: Philip J. Cook, Jens Ludwig, and Justin McCrary

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-11512-7

Volume URL: http://www.nber.org/books/cook10-1

Conference Date: January 15-16, 2010

Publication Date: September 2011

Chapter Title: Crime and the Family: Lessons from Teenage Childbearing

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Chapter URL: http://www.nber.org/chapters/c12094

Chapter pages in book: (p. 573 - 598)

Crime and the Family
Lessons from
Teenage Childbearing

Seth G. Sanders

12.1 Introduction

In an influential summary paper, Loeber and Stouthamer-Loeber (1986) conduct a meta-analysis on the literature on family factors and their correlation with conduct problems and delinquency. After careful review of both longitudinal studies and concurrent studies that compare delinquents with nondelinquents, they conclude that lack of parental supervision, parental rejection, and parent-child involvement are among the most powerful predictors of juvenile conduct problems and delinquency. Contained within this review there is an important and overlooked finding—the effect of these factors seems to be about the same for boys and girls. That this finding has gotten considerably less attention than the main finding of the role of family factors on delinquency most likely stems from a simple fact—crime is mostly a male activity.

Teen childbearing is, of course, an entirely female activity. Like crime in boys, teenage childbearing is consistently correlated positively with family background factors that measure disadvantage. These include being from a single-parent family, being on Aid to Families with Dependent Children/Temporary Assistance for Needy Families (AFDC/TANF) as a young adolescent, and having parents with lower education. It is hard to identify an aspect of family disadvantage that is not correlated the same way for crime in boys and teenage childbearing in girls. The central argument of the chapter is that much is to be gained by considering teenage childbearing for girls and crime for boys as two variants of antisocial behavior, perhaps even stemming from the same developmental process. We argue that the same developmental

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process that led boys to grow up willing to violate the social norms necessary to commit crime led girls to violate the social norms in their own domain.

There are both empirical and theoretical reasons to believe this view. Figure 12.1 presents a five-year moving average of the annual percentage change in teenage childbearing. We begin the time series in 1975 because, while teenage childbearing was substantially higher in the 1950s and 1960s, it was largely within marriage. Theoretically, it is teenage childbearing outside of marriage that does not accord with social norms. Figure 12.1 also presents a five-year moving average of the annual percentage change in violent crime and property crime. What is clear from figure 12.1 is that these two patterns are remarkably coincident. All three series fall through the 1970s reaching a trough in 1983, rise steeply between 1983 and 1988, and then fall until 1998 and rise again thereafter.

Theories in developmental psychology link the "production of children" to the development of criminal behavior and teenage childbearing. These theories were developed to explain regularities between early childhood conditions, childhood aggression, conduct disorder, juvenile delinquency, and, finally, criminal behavior in adolescence and beyond. While there are
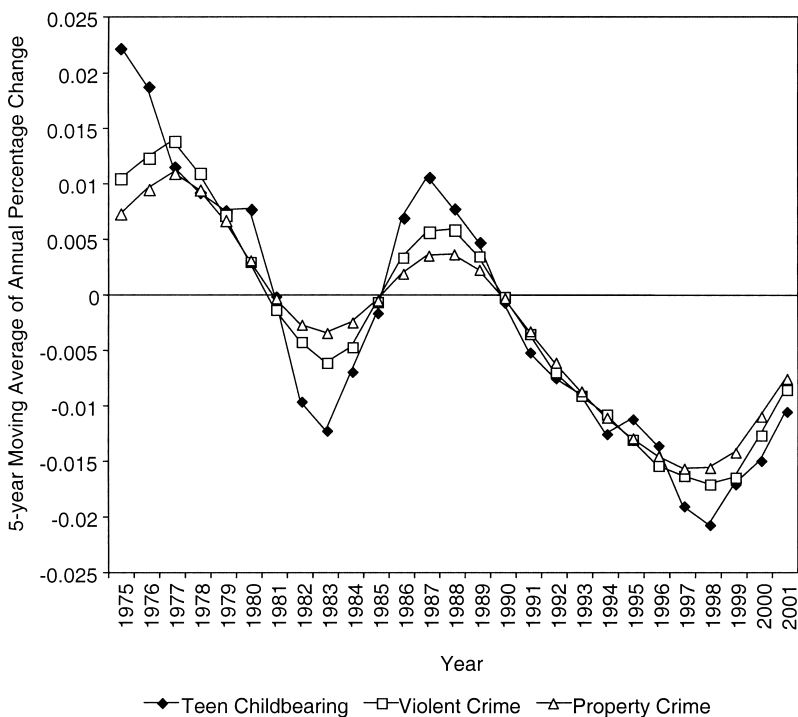
Fig. 12.1   Teen childbearing and crime

many theories that make a link between biology, childhood conditions, and personality outcomes, Moffitt (1993) lays out an elegant one that has had a major impact on psychology and criminology. Moffitt classifies individuals into two groups. These groups differ in the continuity of antisocial behavior across age and in their responsiveness to life events in adolescence. Life-course-persistent (LCP) individuals display antisocial behavior at a young age, and antisocial behavior remains a stable personality trait over the life course and over all kinds of conditions and situations. According to Moffitt, the source of this personality type may originate as biological; then in childhood, it is enforced or dampened by interactions between the parents and the child. Adolescence-limited (AL) individuals are involved in crime only through their adolescent years and display low levels of antisocial behavior both before and after adolescence. Moffitt speculates that in modern society, where adult responsibilities begin well after physical maturation, adolescents display this form of antisocial behavior as rebellion. During adolescence, the two groups are indistinguishable, both displaying serious delinquency. But ALs have well-developed empathy, are generally of higher intelligent quotient (IQ), and are able to weigh the costs and benefits of criminal activity, especially after adolescence.

Another underappreciated advantage of the developmental perspective, and the one emphasized here, is that by concentrating on the origins of antisocial behavior in general rather than crime specifically it is a theory that applies equally to males as it does to females. According to Moffitt (1993), while adolescent antisocial behavior may express itself differently in teenage boys and girls, the basic taxonomy and the origins of groups remains the same. This is different than other gendered theories, especially in sociology, that, for example, emphasize the absence of a male role model affecting boys more than girls (Anderson 2000; Parker and Reckdenwald 2008).

A reasonable question is why might policymakers care about this developmental theory and about the theory being applicable to both boys and girls? Most of the policy manipulations in this volume attempt to change incentives or opportunities to commit crime in order to limit it. Policies such as increased policing or imprisonment work by trying to influence the behavior of crime-prone individuals. Policies explored here, such as supporting good parenting practices, operate by trying to change the fraction of the population that will become crime-prone. The ultimate policy question is, could shifting dollars from policing and imprisonment toward family support, especially supporting parenting aimed at building self-regulation in children, be effective in lowering crime? While we do not answer this important question here, we do address its plausibility. We also suggest that it is impossible to answer the cost-effectiveness of such a shift without taking into account the possible efficacy of lowering teen childbearing and its associated costs through the same shift in resources.

Section 12.2 of the chapter discusses in more detail how family structure

may affect antisocial behavior in boys and girls. This section argues that that by thinking about teenage childbearing and crime as two versions of antisocial behavior, there is a clear intergenerational link—mothers displaying the female version of antisocial behavior (teenage childbearing) would have boys that display the male version (crime). We review the literature on the link between teenage childbearing and crime and conclude that it is among the most robust findings on family structure and crime. In section 12.3 we review the empirical evidence in economics of the link between two family policies and the rise of crime in the late 1980s and then its subsequent decline—abortion laws and divorce laws—and touch on the role of changing welfare policy. We conclude that the evidence here is fragile, and the fragility stems from extremely limited time series and spatial variation in policy. Section 12.4 then takes a brief look at randomized controlled trials (RCTs) that try to manipulate directly aspects of parent-child interactions. As a whole, the RCTs that intervene to provide support in childrearing seem positive, but the impacts on crime and teenage childbearing remain inconclusive. Section 12.5 concludes.

12.2 Teen Childbearing and Crime

We have argued that teenage childbearing and crime stem from the same source, family upbringing that increases the propensity to develop antisocial behavior. The most extreme forms of bad parenting are neglect and abuse, which is consistently shown to increase the rate of externalizing behavior when children enter their adolescent years. One recent study by Jonson-Reid et al. (2010) used official report data on child maltreatment from the Missouri Division of Social Services (DSS) with behavioral data from 4,432 epidemiologically ascertained Missouri twins from the Missouri Twin Registry (MOTWIN). The rates of childhood abuse for a child was examined when his or her cotwin was in one of four groups: monozygotic (MZ) with the cotwin displaying externalizing behavior, dizygotic (DZ) with the cotwin affected, DZ with the cotwin unaffected, and MZ with the cotwin unaffected. Given the assumption of equal environment, the difference in the rate of externalizing behavior between MZ and DZ twin outcomes for a given cotwin status can be interpreted unequivocally as effects of gradations in inherited liability. The analysis showed strong effects of child maltreatment on externalizing behavior; it also showed that the effects were strongest when a MZ cotwin displayed externalizing behavior. This suggests that there is an additional role for inherited factors but does not mitigate the large role of childhood maltreatment.

There is now ample evidence that young mothers are much more likely to be reported for physical and sexual child abuse or child neglect. Lee and George (1999) examine child maltreatment among the 1982 to 1988 birth cohorts in Illinois. They use administrative data for the entire population

of abuse and neglect cases and match this to birth certificate data so that the incidence rate of child maltreatment can be estimated and correlated with risk factors. Even after controlling for other sociodemographic factors, maternal age and poverty were each strong predictors of a substantiated report of all types of child maltreatment. The results indicate that the two factors combined compound the risk of being a victim of substantiated child maltreatment.

How child maltreatment is linked to antisocial behavior in adolescents is not entirely clear, but one theory revolves around the known link between the neurotransmitter serotonin and impulsive and aggressive behavior. Both the temporal lobes and the prefrontal cortex help regulate mood and behavior. One theory is that impulsive or poorly controlled behavior stems from a functional abnormality in serotonin levels or in these brain regions. Much of the work on gene-environment interactions revolves around genes that regulate neurotransmitters, especially serotonin and dopamine.

Given the close link between antisocial behavior in adolescents and criminal behavior in adults, it is perhaps not surprising that one factor that has been found to be robust in both the economics and psychology literature is the link between the age of a mother when she first gave birth and the criminal propensity of all of her children. This literature draws an interesting distinction between the age of the mother when the study child was born and her age when she first gave birth. Two excellent studies, one by Nagin, Pogarsky, and Farrington (1997) and another by Grogger (1997) find similar results using data from different sources. Nagin, Pogarsky, and Farrington (1997) use data from the Cambridge Study in Delinquent Development, a prospective longitudinal study of 411 males from working class London born in 1952 or 1953. Grogger uses data from the National Longitudinal Survey of Youth, 1979 (NLSY79), a prospective longitudinal nationally representative sample of more than 6,000 men in the United States born in 1958 to 1965. Despite differences in the focus, country, and time period, both studies find strong evidence that the age of a woman when she first gives birth is strongly negatively correlated with criminality of all of her children.

One difference between the two studies is whether there is any role for the age of the mother at the study child's birth; Nagin, Pogarsky, and Farrington (1997) find no role at all; Grogger (1997) presents mixed results. When a categorical variable reflecting a study child's mother being less than eighteen when the study child was born is entered into the regression model, this variable is uncorrelated with the study child's criminal outcome. However, when the age of the mother at the study child's birth is entered linearly and regressed against the study child's criminal outcome, there does appear to be evidence that being born when your mother is older reduces criminal propensity. Much of the variation that identifies the linear effect of the age of the mother at the study child's birth comes from comparing outcomes of women having children in their early twenties versus later twenties because

most childbearing in the sample occurs when women are in their twenties. Grogger uses this linear effect to predict the effects of delaying teenage childbearing from age sixteen to older adult ages, but it is clear that this prediction relies on a strong functional form assumption.

One enormous advantage of Nagin, Pogarsky, and Farrington (1997) is the rich data that allow them to begin studying the *mechanism* behind the correlation between age of a child's mother when the child is born and criminality. They lay out three potential mechanisms: (a) life course-immaturity; (b) persistent poor parenting/poor parental role models; and (c) diminished resources. The life course-immaturity mechanism is that teenagers lack the development and maturity to raise a child properly. One version of the persistent poor parenting mechanism is that women become teenage mothers because they lack self-control, are impulsive, self-centered, quick-tempered, inconsistent, and avoid difficult tasks with delayed benefits. These same factors make them poor parents and lead to the intergenerational transmission of antisocial behavior (see, for example, Gottfredson and Hirschi 1990). The diminished resources mechanism focuses on the classic mechanism emphasized in sociology between impoverishment and antisocial behavior.

Nagin, Pogarsky, and Farrington (1997) find bivariate evidence that both being born to a mother whose first child was born when she was a teenager and being born to a young mother per se increases criminality; however, once they control for family size, only the former effect remains. Having more children clearly means resources are spread across more family members, and this they take as evidence against mechanism (a) because there is no direct effect mother's age at the study child's birth and for mechanism (b) because larger family size entirely explains the direct effect of a mother's age at the study child's birth. In order to explain the effect of being born to a mother whose first child was born when she was a teenager, Nagin, Pogarsky, and Farrington use the extremely detailed data that document persistent poor parenting and other measures of diminished resources. Once controlling for these factors, the mother's age at her first child's birth also no longer affects the criminal outcomes of her children. Besides family size, which remains strongly significant, the most significant factors that mediate the effect of mother's age at first birth on her children's criminality are the child's father's criminality and whether the father separated from the mother by age ten. Nagin, Pogarsky, and Farrington conclude then that it is most likely a combination of persistent poor parenting and diminished resources that explains the link between teenage childbearing and the criminal outcomes of those children.

One issue worth discussing is how to interpret the strong role that family size plays on explaining all of the effect of being born to a teenage mother and half of the effect of being born to a mother whose first birth was as a teen. Nagin, Pogarsky, and Farrington (1997) prefer the interpretation of larger families being more resource constrained, which is clearly true. But

from a host of work, we believe that the timing of fertility is closely linked to a number of person-specific factors. Moreover it is likely that teen mothers that end up having very large families are different in these factors from teen mothers who are able to better space the interval between children and, perhaps, even to have the next child within marriage. This raises the possibility that "family size" might also be picking up the kinds of unobserved factors described by Gottfredson and Hirschi (1990) that make teen mothers poor parents. While not interpreted in this way, Nagin, Pogarsky, and Farrington present evidence that family size is not likely to be just reflecting "diminished resources." If a teenage mother with a child has a second child, her family size goes from two people to three people. If we put aside for a moment any correlation between family size and economic resources, resources per person would be reduced by 33 percent by this one-child increase. If a teenage mother with four children has a fifth child, her family size goes from five people to six people. Resources per person are reduced by 17 percent. If increased family size was only affecting "diminished resources," then we would expect the criminality of children to rise much more when a mother with one child had an additional child than when a mother with four children had an additional child. In fact, among teenage mothers, criminality of children is the same when a woman has one or two children, but the criminality of children from families with five children is 50 percent higher than families with four children. One interpretation for this pattern is that teenage mothers who have no more children or one more child are both displaying a large degree of "self-control." But very large family sizes might also be correlated with very low levels of self-control.[1]

Pogarsky, Lizotte, and Thornberry (2003) contribute additional evidence using the same basic strategy of Nagin, Pogarsky, and Farrington (1997) but use contemporary data from the United States—the Rochester Youth Development Study (RYDS). The RYDS sampled 1,000 seventh-grade and eighth-grade students enrolled in public school in Rochester, New York in the 1987 to 1988 school year. Students and their parents were reinterviewed semiannually from 1988 to 1992 and annually from 1994 to 1997. In 1997, the average age of the respondent was twenty-two. Like Nagin, Pogarsky, and Farrington, Pogarsky, Lizotte, and Thornberry find no role for the age of the mother at the study child's birth, and they also find a strong role for the age of the child's mother at her first birth. Unfortunately, because the RYDS does not include completed family size, which was found to play a major mediating role in Nagin, Pogarsky, and Farrington, Pogarsky, Lizotte, and Thornberry cannot control for it. Pogarsky, Lizotte, and Thornberry do find that one variable does mediate the effect of being born

1. Another plausible interpretation is that women's total resources might fall with the number of children. If so, women with five or more children may be especially poor, lending credence to the "diminished resource" interpretation.

to a mom whose first birth was as a teen—the number of changes in family structure during the first two and a half years of the survey. Because children almost always live with their biological mothers, this variable measures the short-term changes in the mother's relationships with the child's father, child's stepfather, and mother's boyfriends. While Pogarsky, Lizotte, and Thornberry find that changing family structure mediates the effect of being born to a mom whose first birth was as a teen, the effect remains strong and significant even after controlling for measures of parenting and diminished resources.

In summary, there is strong evidence of a link between age at a mother's first birth and criminality of sons; there is weaker evidence of link between a mother's age at the study child's birth and criminality of her sons. Nagin, Pogarsky, and Farrington (1997) suggest that early childbearing is correlated with poor parenting and role modeling and with reduced access to resources, and these are the principal mechanisms through which the association between early childbearing and criminality of sons operates. If one believes that a series of short-term relationships could detract from parenting, then the poor parent/role model mechanism is also suggested by Pogarsky, Lizotte, and Thornberry (2003). Confirmation of reduced access to resources is not as consistently confirmed as it plays a limited role in Pogarsky, Lizotte, and Thornberry (2003) and no role in the studies that model current criminality against state welfare benefits when the young adult was a child.

12.3 Evidence on Family Policy and Crime

While figure 12.1 presents the strong comovement of teenage childbearing and crime, it is not clear what might have changed in families or what would have caused such a change. A worsening situation for children with regard to their upbringing in the early to mid-1970s would twenty years later lead to increased antisocial behavior. During this time period, there were at least three large social changes affecting the family: changes in abortion laws, divorce laws, and the size of the welfare system.

In January 1973, *Roe v. Wade* established that the right to privacy allowed women to seek abortions up until the point when the fetus became viable, which the court defined as twenty-four weeks. In the companion case, *Doe v. Boulton,* it also allowed abortion at later gestational ages when needed to protect a women's health. These decisions affected abortion laws in forty-five states. California, New York, Washington, Hawaii, and Alaska had liberalized abortion in 1970.

There is considerably more variation in divorce laws across states than abortion laws. There are many state laws governing various aspects of divorce, including whether one party can unilaterally seek it, the needed length of time separated before seeking divorce, laws governing division of property, and whether fault is used as a criterion for the division of property.

The right to seek a divorce unilaterally has been the focus of much of the literature on divorce and its effects. The early to mid-1970s was a time of enormous change in divorce laws, just as it was for abortion. Between 1970 and 1975, twenty-eight states moved from divorce requiring mutual consent to divorce being available unilaterally. California, Washington, and Hawaii all adopted unilateral divorce during this period; Alaska has had the longest history of unilateral divorce (1935), and New York has still not adopted unilateral divorce.

Finally, beginning in the late 1960s, there was a considerable expansion in cash and in-kind transfers to poor families. Prior to the Food Stamp Act of 1964, transfers to the poor through federal programs was largely limited to cash transfers from the AFDC program. Beginning in the late 1960s, there was a great expansion of both the food stamp program and Medicaid, the primary program that provides medical care to poor people under age sixty-five. The Food Stamp program expanded by about 1 million people per year from 1965 to 1970, reaching 6 million recipients in May of 1970. Then by February 1971, the program reached 10 million recipients, and by October 1975 reached 15 million recipients. Geographic expansion accounts for a large part of the growth. Similarly, Medicaid was established in 1965 through title XIX of the Social Security Act and expanded geographically through 1982. With health care costs rising faster than other prices, Medicare comprises a rising fraction of transfers to poor families.

Figure 12.2 graphs the monthly welfare transfer to a family of four in New York. Figure 12.2 graphs both the dollar value of AFDC benefit (in US$1982) and an estimate of the total dollar value of transfers that include AFDC, food stamps, and the value of Medicaid. The early 1970s saw an expansion in the real value of cash transfers. But the big expansion in welfare benefits came from benefits from the newer food stamp and Medicare program. Support to poor families expanded precipitously between the late 1960s and mid-1970s and have been in a long-term decline since. Policy changes in the Reagan administration (Omnibus Budget Reconciliation Act [OBRA]) account for the first steep fall in welfare benefits; an even more important policy change during the Clinton administration (Personal Responsibility and Work Opportunity Reconciliation Act [PRWORA]) fundamentally changed the cash transfer system instituting work requirements and, importantly, time limits on the receipt of benefits (not pictured).

All of these policy changes may have affected parent-child interactions. Abortion gave women greater choice on the timing of birth. This may have caused a change in the composition of births, with women not in a position to raise children terminating their pregnancies. It also may have reduced the number of unwanted births in other ways. With the expansion of unilateral divorce, there was rapid rise in the number of divorces and the number of children being raised without two parents in their home. And the rapid rise in welfare benefits, while potentially mitigating poverty for children,
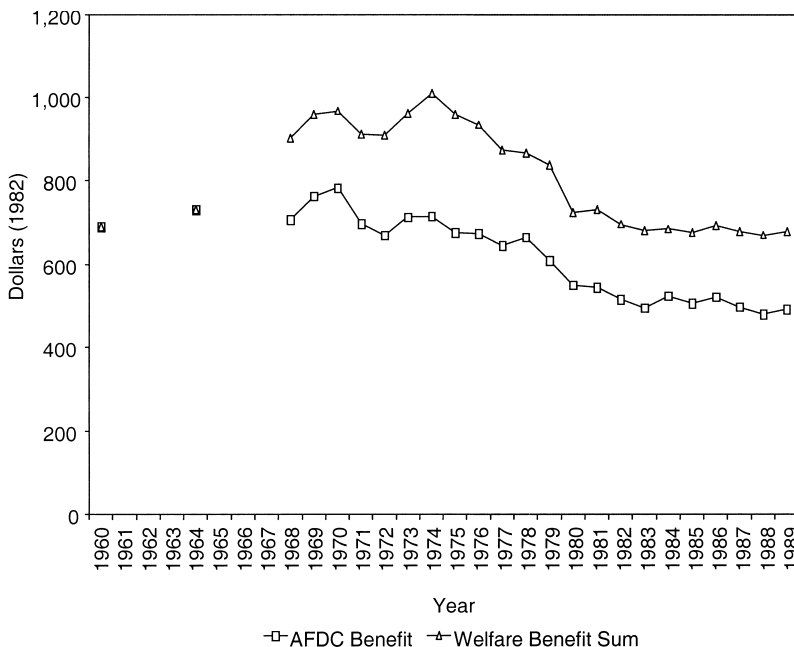
Fig. 12.2   Monthly welfare benefits for family of four, New York

often occurred in a context of these benefits being directed to unmarried mothers. As emphasized by Becker (2000), it also may have instituted a devaluation of work and a rise in the "welfare culture."

While all of these factors may be potential explanations for the coincident rise in teen childbearing and crime, what is also clear is that sorting across these will be difficult. The early to mid-1970s was a time of great change in family policy, and these policies tended to move together both over time and within states. We review the following literature on the link between abortion policy and crime and divorce policy and crime. We note here that no work to date attempts to simultaneously distinguish the effect of these multiple policy changes; it is an empirical issue whether there is enough independent variation to do so.

12.3.1   Abortion Law Changes and Crime

In an influential paper, Donohue and Levitt (2001) investigate the effects of abortion liberalization on crime. They offer evidence that legalized abortion has contributed significantly to crime reductions in the 1990s. The evidence that is most compellingly exogenous is that crime rates began to fall roughly eighteen years after abortion legalization. The very states that allowed abortion in 1970 experienced declines earlier than the rest of the nation. They also offer evidence that states with high abortion rates in the

1970s and 1980s experienced greater crime reductions in the 1990s. Their controversial claim is that legalized abortion accounted for as much as 50 percent of the drop in crime over the 1990s.

Donohue and Levitt (2001) have been criticized on a number of grounds, and a full critique is beyond the scope of this chapter (see Joyce 2004; Foote and Goetz 2005; Ananat et al. 2009; and Joyce 2009). The one critique relevant here raised both by Joyce (2004) and Foote and Goetz (2005) is that results are substantially weaker if we adopt the practice of clustering residuals at the state level (rather than the state-by-year-of-birth level as in Donohue and Levitt's original paper). The difference is important if, for example, there is a correlation between the error for, say, seventeen-year-olds in one year and other age groups (besides eighteen-year-olds) in the following year within a state.[2] The essential issue is that because only five states liberalized abortion prior to 1973, at its core, evidence revolves around patterns of crime in these five states relative to other states. No matter how many people are observed across states, it may be that most of the information is contained in the average crime level in these five states versus the other forty-five states.[3] The lack of power for detecting effects is endemic to the empirical design because there is very little independent variation in the policy of interest. That Donohue and Levitt (2001) are able to make progress at all is because their measure of historic abortion rates combines whether abortion was legal in a state when a young adult was in utero with the abortion level in that state in that year. This part of the variation is more easily criticized because states vary a good deal in the level of abortion even after legalization in predictable ways (for example, abortion rates per capita are low in Utah and high in California, New York, and Washington, DC). Adding fixed effects to the model takes out fixed state-level characteristics, which is helpful but does not account for changes over time such as the composition of the population. However, it is notable that a recent paper by Donohue, Grogger, and Levitt (2009) finds that historic abortion rates are negatively correlated with contemporaneous teen childbearing rates.

Criminologists and increasingly some economists dismiss the Donohue and Levitt (2001) results because simple plots of age-specific crime rates are inconsistent with a large cohort effect following the legalization of abortion. Because Donohue and Levitt's analysis does not use age-specific crime rates, this time series pattern was not assessed in their work. In states affected by *Roe v. Wade*, it should be that crime rates for sixteen-year-olds should peak

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2. This point became much more appreciated in the empirical microeconomics literature after Bertrand, Duflo, and Mullainathan (2004) showed its numerical importance in a number of applications.

3. This statement is more precisely true the more correlated are observations within states. It is somewhat unclear in Donohue and Levitt (2001) exactly what variation is empirically important, variation in effective abortion rates driven by the adoption of abortion reforms or the growth in the number of abortions within a state after reforms.

in 1989, sixteen years after the 1973 legislation; for seventeen-year-olds, it should peak in 1990; for eighteen-year-olds in 1991, and so on. Similarly for the five states that liberalized in 1970, the peak for sixteen-year-olds should occur in 1986; for seventeen-year-olds in 1987, and so on. Joyce (2009) displays these simple plots, and there is no evidence of this pattern. For the states that liberalized in 1970, the peak for all ages is between sixteen and twenty in 1992, suggesting no presence of a cohort pattern. Donohue and Levitt criticize this evidence as they believe that the crack epidemic clouds the cohort effect they uncover. But Joyce (2009) argues that the same cohort argument should hold at older ages if Donohue and Levitt are correct and the crack epidemic largely did not affect older men and women. If Donohue and Levitt are right, twenty-seven-year-olds in the early liberalizing states should show peak crime rates in 1997, twenty-eight-year-olds in 1998, and so on. Time series plots show no discontinuity at any age between twenty-seven and thirty in either *Roe v. Wade* states or early liberalizing states.

The bottom line is that it is asking a great deal of aggregate data to reveal a pattern where cause and effect are separated by sixteen or more years, especially when the main variable of interest has limited temporal variation across states. It is little wonder that the relationship between abortion and crime remains controversial. Having said this, the link between the "wantedness" of children or how parents treat children and criminality is entirely justified on theoretical grounds. For this reason, it may be fruitful to examine other aspects that affect how children were raised that display more variation across time and space.

12.3.2   Divorce Law Changes and Crime

Divorce laws display substantially more variation across time and states. Unilateral divorce states allow either the husband or wife to sue for divorce without the consent of the other party. Friedberg (1998) classifies states into unilateral versus mutual consent states. Unlike legal abortion, which became the law in all states in 1973, there are still five states where divorce is by mutual consent; in addition, while a great number of states changed from mutual consent to unilateral divorce between 1968 and 1973, nine states adopted unilateral divorce prior to 1968, and ten states adopted unilateral divorce after 1973. This gives considerably more variation over time in when state policy may have affected families relative to abortion policy.[4]

Many studies have established bivariate correlation between being raised in a single-parent home and increased risk of involvement in crime as boys become young adults (Rebellon [2002] among others). Similarly, the bivariate relationship between being raised in a single-parent home and increased

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4. However, in both cases, no state has reverted back to its original policy of mutual consent after adopting unilateral divorce. In this sense, the experimental design is similar to abortion laws in that we have not had the opportunity of observing the effects of removing the policy as would be done in a "cross-over" design.

risk of teenage childbearing in girls is also well established (Manlove [1997], among others). In many of these studies, this relationship holds after controlling for a number of observed factors. What is more controversial is whether single parenthood per se is responsible for these outcomes or if other omitted factors contribute to both single parenthood and antisocial behavior.

Changes in divorce laws possibly could help us answer this question as it is now generally agreed that these changes in divorce laws did, in fact, lead to a short-term increase in divorce (Wolfers 2006). Caceres-Delpiano and Giolito (2011) use these changes in divorce laws to investigate the effects of family structure on crime. Specifically, they investigate whether it is true that there is consistently a rise in crime thirteen to sixteen years following the liberalization of divorce laws. They find an impact of around a 15 percent increase in the murder rate and the rate of aggravated assault thirteen to sixteen years after unilateral divorce laws were passed. Two other patterns are notable. First, there is little evidence that divorce laws affect crime in the first ten years after the laws are enacted; second, in companion work, they find that the probability of living in an institution increase 35 percent fifteen years or more after the divorce reform was passed (Caceres-Delpiano and Giolito 2011). This paper also established that the reform decreased family income and increased the fraction of mothers below the poverty line. For children, they find that just after the reform, the probability that a child goes to a private school decreased and the likelihood that a child was held back in school increased, and Gruber (2001) confirms that their completed level of schooling is reduced.[5]

Finally, changing resources available through the welfare system might affect the rate of crime and teen childbearing when children become young adults. Lack of financial resources available to young children have been implicated in many studies as a source leading to antisocial development. Importantly, there is a great deal of both time series and spatial variation in AFDC payments even prior to the 1996 welfare reform act PRWORA. Both Donohue and Levitt (2001) and Caceres-Delpiano and Giolito include measures of historic resources available through the AFDC system. Donohue and Levitt and Caceres-Delpiano and Giolito (2011) find that these are largely uncorrelated with the rate of crime eighteen years later.[6] This lack

5. A second indication that the lack of variation in abortion laws limits their usefulness in understanding crime patterns is that any negative correlation between abortion laws and crime rates are eliminated when divorce laws are also included in the analysis.

6. Donohue and Levitt (2001) find that the state AFDC maximum payment fifteen years prior to crime in the current year is uncorrelated with any crime category. Caceres-Delpiano and Giolito (2011) estimate the effect of being in a state that historically had an Assistance to Families with Dependent Children-Unemployment Parent (AFDC-UP) program (results not reported in the paper but reported in personal communication, December 25, 2009). AFDC UP states had considerably higher welfare benefit levels. For example, in 1975, non-AFDC-UP states had an average value of welfare benefits (Medicaid, AFDC, and food stamps) of $515

of correlation between state historic AFDC payments and crime is itself interesting; many studies suggest that material deprivation of individuals as children raise the rate of physical aggression in children and crime in young adults. But parental income involves parental choice (unlike state AFDC payments). One interpretation that parental resources are correlated with aggression and crime of children where state AFDC payments are not correlated is that unobserved factors that lead to bad parental choices in the labor market are correlated with bad parental choices in child rearing.

It is worth drawing attention to a previous debate on cause of the rise in out-of-wedlock childbearing over the 1970s and 1980s. Three main hypotheses have been put forward: (a) the decline in the manufacturing sector that provided good jobs to low-skilled men, making low-skilled men less "marriageable" (Neckerman and Wilson 1987); (b) the rise in the welfare state and the "return" to single motherhood (Murray 1984); and (c) the spread of the pill and abortion and its equilibrium effect on out-of-wedlock sexual behavior (Akerlof, Yellen, and Katz 1996). All three of these events began in the mid-1960s and continued into the early 1970s, and the spread of the pill had little spatial variation. But an area's reliance on the manufacturing industry and state welfare policy have a good degree of variation. Careful work by Brien (1997) shows that the decline in the number of marriageable men did affect out-of-wedlock childbearing, but only a modest amount, and it does not explain the black-white difference in out-of-wedlock childbearing. And careful work by Moffitt (1990) suggests only a modest effect of increased welfare payments on out-of-wedlock childbearing. While the Akerlof, Yellen, and Katz model remains difficult to test, we have made progress in this debate by at least eliminating (a) and (b) as major causes. I suspect we may be in much the same situation in explaining the rise and fall in crime rates over the 1980s and 1990s.

In my view, the Caceres-Delpiano and Giolito (2011) paper is the most compelling to date to link family policy to crime, but it, as well as Donohue and Levitt (2001), fail in one important way—they do little to elucidate the mechanism. As they show, changes in divorce laws raised the rate of single-parent households and also changed a host of other circumstances for children including their access to resources and their level of human capital. In general, it remains difficult to separate the many factors that link childhood conditions and antisocial behavior, but some intervention studies (discussed in the following) are beginning to do this.

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per month in 1989 dollars; AFDC-UP states had a benefit sum of over $700. Julio Caseres-Delpiano also supplied additional analysis of the fifteen-year lagged state AFDC maximum benefit level on property crime, violent crime, murder, rape, robbery, and aggravated assault. With the exception of property crime, which was small in magnitude and marginally significant, fifteen-year lagged ADFC was not statistically related to any criminal outcome (personal communication, December 27, 2009).

12.4   Evidence from Intervention Studies

There are now a number of intervention studies that look to see how various interventions affect antisocial behavior of children and adolescents and criminal outcomes as adolescents become adults. While there have been many programs implemented to curb antisocial behavior and young adult crime, there has been a shortage of rigorous evaluation of programs. In 2001, the surgeon general issued a report *Youth Violence: A Report of the Surgeon General* that suggested four criteria for what constitutes evidence of a model program (U.S. Department of Health and Human Services 2001). According to this report, a "model" program met the following criteria:

- Rigorous experimental design (experimental or quasi-experimental)
- Significant deterrent effects on:
  - Violence or serious delinquency
  - Any risk factor for violence with a large effect (.30 or greater)
- Replication with demonstrated effects
- Sustainability of effects

When looking across multiple interventions, only five programs met these criteria. These include (a) Functional Family Therapy (FFT); (b) Multi-dimensional Treatment Foster Care (MTFC); (c) Multisystemic Therapy (MST); (d) Seattle Social Development Project (SSDP); and (e) Prenatal and Infancy Home Visitation by Nurses, also known as the Nurse Family Partnership (NFP). What is particularly interesting about this list is that four of the five programs had a strong home-based family intervention component (all except SSDP). When the surgeon general reviewed programs that were "promising" but not conclusive or were shown not to work, many more of these programs did not have family intervention as a major component (including Perry Preschool and other school-based programs). The five programs varied in important ways, including the target population, the length of treatment, the intensity of treatment, and sample size. But these differences should be discussed in the context of all five programs having a component of parental training, especially parental management of difficult child behavior.

The largest study and the study that has received the most critical evaluation and replication is the NFP. The NFP was first implemented in 1977 and now serves 20,000 families in twenty states in the United States. Besides extensive research on the impacts of the NFP, there have also been excellent studies documenting its cost-effectiveness. In addition, President Obama has pledged that the highly successful NFP and similar home visiting programs will be expanded to reach all low-income, first-time mothers, and funding for expanding this program is included in the 2010 budget. Because intervention studies are reviewed in great detail in chapter 8 and its

accompanying comment section, we discuss them here only as an example of the potential of family intervention. We do provide, however, the major elements of all five of these programs and their impacts on crime in table 12.2 so that a comparison to NFP may be made.

12.4.1 The Nurse Family Partnership

The NFP program's first evaluation began in Elmira, New York in 1977. The original study enrolled 400 mostly disadvantaged first-time mothers and their children; half were assigned to receive home visitation by nurses (HVN) and the rest assigned to a control group that receive transportation for prenatal and well-child care but no nurse visits. Elmira, New York was predominantly white, rural, and poor in 1977. The practical effect of recruiting first-time mothers from a poor area is that a large fraction (47 percent) were teenage mothers (age eighteen or below), and 62 percent were single parents. Visits began during pregnancy and continued until the child's second birthday. Olds et al. (1988) felt that each of these four elements was essential. Targeting *first-time parents* provided the best chance of promoting positive behavior in mothers before negative behaviors had become habituated; having the program *in the home* was essential because this is where most parenting occurs (and because it did not rely on parents to travel to a site); having *nurses* deliver the program was essential because mothers would trust them to know about pregnancy and the care of infants; and having *visits begin during pregnancy* would mitigate damaging effects in the prenatal environment and would build trust between mother and nurse, making mothers more receptive to parenting advice.[7]

Nurse visits had three goals: healthier prenatal care; more sensitive child care; and a better maternal life course. To help mothers, nurses helped women return to school, find work, and practice family planning. Nurses helped women improve their health-related behaviors, improve the quality of their infant care, and improve their personal development by setting achievable goals and to use problem-solving methods to gain control over the difficulties they encounter (Olds, Henderson, and Kitzman 1994). The NFP is a moderately intense intervention with about thirty visits of up to ninety minutes in length or forty-five hours over two and a half years.

The NFP experiment was repeated in Memphis in 1987 and Denver in 1994. Because the Elmira experimental positive results (discussed in the following) proved stronger for disadvantaged first-time mothers, the recruitment in these studies was limited to *disadvantaged* first-time mothers. Across studies, the NFP has been shown to be statistically significantly related to

7. This was tested in the 1994 Denver experimental implementation of the NFP. Here, both nurses and paraprofessionals delivered the NFP curriculum; Olds finds that nurse home visitors are more effective than paraprofessionals in delivering the NFP curriculum and that the positive effects of the program are larger with nurse home visits (Olds et al. 2004).

a host of positive outcomes for women and children. For example, by two years after the birth of their first child, Olds et al. (1986) and Kitzman et al. (2000) find the following:

- Among low-income unmarried teen mothers, the rate of child abuse or neglect was 4 percent for mothers receiving HNV; it was 19 percent in the control group (Elmira, New York).
- Women receiving HNV smoked 25 percent fewer cigarettes over the course of their pregnancy than the control group (Elmira, New York).
- Women receiving HNV had 23 percent fewer pregnancies, and when pregnancies occurred, there was longer spacing (Memphis, Tennessee; similar for Elmira, New York).
- Children whose mothers received HNV had 80 percent fewer days of hospitalization for injuries than the control group (Memphis, Tennessee).

A host of other positive outcomes have been observed in the two years following the mother's first birth, including higher rates of work and completing school for mothers and better language and executive functioning scores for children.

The central question for us is could the NFP prevent crime? Certainly the NFP lowers the factors that have been consistently shown to be correlated with crime, including family size, child abuse and neglect, and arrested neurological development due to in utero insults such as smoking. A 1997 study of mothers thirteen years after the Elmira intervention ended suggests that all of these benefits were sustained over time. In a 1998 study, Olds et al. (1998) follow up the children of the Elmira, New York sample when the child was fifteen years old. They find that children born to women who were unmarried and from households of low socioeconomic status (risk factors for antisocial behavior) and who received HNV reported that their adolescent child had fewer instances (incidence) of running away (0.24 versus 0.60; $P = .003$), fewer arrests (0.20 versus 0.45; $P = .03$), fewer convictions and violations of probation (0.09 versus 0.47; $P = .001$), fewer lifetime sex partners (0.92 versus 2.48; $P = .003$), fewer cigarettes smoked per day (1.50 versus 2.50; $P = .10$), and fewer days having consumed alcohol in the last six months (1.09 versus 2.49; $P = .03$). They also reported that their children had fewer behavioral problems related to use of alcohol and other drugs (0.15 versus 0.34; $P = .08$). Because of the high correlation between early onset of antisocial behavior and adult criminality, these results bode well for the chances of the NFP to reduce adult crime, but the analysis has not been done to date.

What is notable is the NFP benefits were not limited to the criminality. For example, in the NFP, at age fifteen, the children that received treatment had 0.92 sexual partners, on average; the children in the control group had

2.48 sexual partners, on average. That is, the NFP treatment reduced the number of sexual partners at age fifteen by 150 percent, a result that is highly statistically significant! Age fifteen is too early to know the effect on teenage childbearing, but an educated guess is that teenage childbearing will also be reduced.

In a recent working paper, Bartik (2009) estimates the average benefits of the NFP. He considers the reduced cost of emergency room visits; the savings for the child abuse and neglect system; the increased state and local tax payments of the mom due to increased employment and earnings; reduced welfare payments to the mom; decreased costs to the criminal justice system due to fewer arrests, less court time, and less jail and prison time, principally due to less criminal activity as the child ages; and state and local tax payments of the child due to increased employment and earnings when the child becomes an adult. Table 12.1 presents these estimates. What is clear is that the NFP potentially has great benefits to society. Of the benefits, the decreased cost to the criminal justice system for the children when they become adults comprises almost 40 percent of the total benefit. Bartik argues that given that the cost of each case is, on average, $8,000 to $10,000 (US$2007), it is likely that the NFP is a cost-effective program. He further argues that from a localities perspective, part of the costs are often paid by the Medicaid system, and additional federal funds will be available if President Obama's expansion of the NFP is funded. While this is true, Bartik warns:

> These NFP fiscal benefits are not immediate. Many of the most important fiscal benefits accrue over time, and may occur 5, 10, or more years after the NFP program begins delivering services in the prenatal period to a low-income first-time mother. However, the present value of these gross fiscal benefits does appear to significantly outweigh the costs of the program. How this affects state and local policy depends upon whether policymakers adopt a long-term perspective. (6)

While the program does appear cost-effective, it is important to recognize that the calculation of the cost savings through the criminal justice system is based on an important projection. There is empirical evidence on the NFP's effect on reduced arrests and jail time for the mother and on reduced arrests of the child up to age fifteen. The third and largest effect in this calculation, however, is the reduced arrest and jail time of NFP children in their adult years. Because this has not yet been observed, Bartik (2009) forecasts this based on the relationship between reduced arrests of the child prior to age fifteen on the odds of the child having an adult criminal career. However, a recent study follows the children of the NFP to age nineteen, linking in administrative arrest data from the criminal justice system. This study shows that while there is substantial evidence that criminal behavior of girls is significantly reduced, there is no impact on the arrest rate of boys at age

Table 12.1   **Breakdown of present value of fiscal benefits from the Nurse Family Partnership (NFP) program per NFP case**

Category of fiscal benefit	Present value of fiscal benefits per case (2007$)
Reduced emergency room visits	156
Reduced child welfare system costs due to reduced child abuse and neglect	1,322
Increased state and local taxes from mom's added employment	1,898
Decrease in welfare system payments to mom	4,771
Decrease in criminal justice system costs (principally costs of child's adult criminal career)	5,894
Increased state and local taxes from increase in child's earnings as an adult	1,231
Total fiscal benefit	15,273

Source: From Bartik (2009). See Bartik (2009) for assumptions and methods.

Note: Dollar figures are rounded to nearest dollar. Present value is calculated using 3 percent real discount rate.

nineteen. It is unclear what this means over the life course, and it may be that as boys age, the positive impacts of the NFP will appear (as they have appeared for girls). But it will be some time before we know whether the size of the impact on crime used in Bartik's cost-benefit calculation will hold for the NFP children.

12.5   Conclusion

Overall, there are several lessons that we can draw from the literature linking the family to criminal outcomes. First, the evidence on the link between a woman being a teen mother and the subsequent criminal behavior of all of her children seems strong. These children are typically raised without two parents and no doubt in frustrating circumstances for their mothers. That increased ease of divorce increases the criminal behavior of children is also consistent with a link between family structure and crime. Interestingly, the NFP that directly intervenes to aid teenage mothers has shown effects at reducing criminal outcomes when their children become young adults, although it is not clear whether these effects will be sustained at older ages. Three other programs (in table 12.2), all with a major component of family therapy, show impacts of reducing crime or crime precursors among adolescents and young adults.

This chapter argues that developmental theory nicely ties together two lines of research that have to date preceded independently: crime in boys and childbearing in girls. From the perspective of developmental theory, these are simply two expressions of antisocial behavior where the domain of that behavior is sex-specific. Recognizing this possibility allows us to look at

Table 12.2 Five model youth antiviolence programs identified in surgeon general's report (2001)

	Nurse Family Partnership	Functional Family Therapy	Multidimensional Treatment Foster Care	Multisystemic Therapy	Seattle Social Development Project
Investigator/ organization	David L. Olds, University of Colorado	James F. Alexander, University of Utah	Patricia Chamberlain, Oregon Social Learning Center	Scott W. Henggeler, Medical University of South Carolina	J. David Hawkins, University of Washington
Target population	First-time mothers (Elmira, NY); African American disadvantaged first-time mothers (Memphis, TN); disadvantaged first-time mothers (Denver, CO)	At-risk (often offending) youth 11–18 and their younger siblings	Adolescent youth with severe criminal behaviors	Violent and chronic juvenile offenders	1st graders and 5th graders, 18 public elementary schools (Seattle, WA)
Sample size	354, 189 NHV, and 165 C (Elmira, NY); 1139, 230 HNV (prenatal only); 228 HNV, 681 C (Memphis, TN); 735, 245 paraprofessional HV, 235 NHV, 255 C (Denver, CO)	40, 20T, 20C (1973 study); 86, 40 T, 46 C (1977 study); 750, 323 T, 427 C (2002 study)	79, 37 T, 42 C (1997 study)	84 (1992, study 5); 176 (1995, study 6); 155 (1997, study 7); 93 (2006, study 14)	643, 144 Full T, 256 Late T, 205 C
Method of recruitment/ assignment	Antepartum clinics	Random court referrals, random assignment	Random assignment from court referrals	Random assignment from court referrals	Nonrandom assignment by classroom
Length of treatment	6 months prenatal; 2 years postnatal; 45 hours	8–12 sessions over 3 months; up to 30 hours	Until restoration of parental custody (typically 3–6 months)	Approximately 4 months; approximately 50 hours	Teachers: 5 days of in-service training Parents: 4–7 sessions (voluntary, 53% of time fail to take up)
Place of treatment	In home	Conducted both in clinic settings as an outpatient therapy and as a home-based model	Foster care homes	Part in home, part in schools and community	Schools

Description of treatment	A nurse home visitor is assigned to the family and works with that family for the duration of the program. Nurses help parents address three areas: improvement of the mother's development; the care the parents provide their child; and the family's pregnancy planning, educational achievement, and participation in the workforce. Nurses provide a comprehensive educational program designed to help parents provide better care for their child. Nurses also help parents clarify goals, develop problem-solving skills, and develop support systems of family and friends who may be able to help them care for their child.	*Engagement phase:* alliance building, negativity reduction, blame reduction, developing shared family focus to present problem. *Behavioral change:* change skills of family members, increasing competency to perform tasks (e.g., communication, parental supervision, problem solving). *Generalization phase:* generalize, maintain, and support changes family has made. Focus turns from within family change to how family will respond to similar future struggles and how family interacts with community (e.g., schools, extended family).	An individualized plan created by case manager and foster family that emphasizes behavioral management techniques and the foster home environment. The home environment to provide youth with structure, limits, and rules. Also behavioral skills training, such as interpersonal skills and prosocial behaviors, discipline techniques, role modeling, establishing rules and consequences for youth, eliminating exposure to negative peer influences, and providing youth with positive and productive relationships. Monitor and reward behavior and provide youth with daily feedback and structure.	Interventions improve caregiver discipline practices, enhance family affective relations, decrease youth association with deviant peers, increase youth association with prosocial peers, improve youth school or vocational performance, engage youth in prosocial recreational outlets, and develop an indigenous support network of extended family, neighbors, and friends to help caregivers achieve and maintain such changes. Family-based approach but also emphasizes social networks (removing child from deviant peers)	Teachers: proactive classroom management (e.g., consistent classroom expectations and routines, explicit instructions for behavior) interactive teaching (e.g., monitor student comprehension, reteach material when necessary), and cooperative learning (e.g., teams of students of different ability and background as learning partners). Parents: offered child behavior management skills and skills to reduce their children's risks for alcohol and drug use.
Length of follow-up	At age 15	Up to 5 years	1 year	Study 5: 5 years; study 6: 4 years, 13.7 years; study 7: 1.7 years; study 14: 1.5 years	At age 21
Effects on crime outcomes	At age 15: fewer arrests (0.20 vs. 0.45); fewer convictions and probation violations (0.09 vs. 0.47).	18 months after study: approximately 30% reduction in recidivism (2002 study); diffusion effects on siblings.	Boys had significantly fewer arrests, incarceration, were more likely to report no further arrests posttreatment. Boys reported significantly less criminal and delinquent behaviors.	Study 5: 43% decline in recidivism; study 6: 69% decline in recidivism (at 4 years), 54% decline in rearrest and 57% decline in days incarcerated (at 13.7 years); study 7: no significant decline in recidivism; study 14: 37% decline in rearrests.	No significant effects on arrests in last year or court charge in last year; significant 20% reduction in probability of every charged (0.53 C vs. 0.42 T).

the literature that links teen childbearing to criminal outcomes of the children in a new way—antisocial behavior may have a strong intergenerational correlation. And there are reasons to believe that this association may be hard to break because there is evidence that the combination of poverty and either immaturity or the personality traits of young mothers may limit their parenting ability, which may be a root cause of next generation's antisocial behavior. In the extreme, these factors have been linked to child abuse and neglect, but it is reasonable that less extreme forms of maltreatment could lead to negative outcomes as well.

Any policy designed to reduce the crime rate of boys that is targeted at the boy's family should start with an obvious fact—under the best of circumstances, raising children is difficult. When you layer on top of this financial strain that is emotionally taxing and self-control issues that many parents of these boys have either due to immaturity or personality traits that lead to early childbearing to begin with, you have a volatile mix that is not likely to lead to good parenting. To the degree that programs like NFP work, it may be because they address the central issue of helping young mothers learn to cope when parenting is difficult. While we do not yet know whether greater help with parent-child interaction skills could help, developmental theory would suggest that targeting mechanisms may help children.

While the intervention studies are encouraging, they remain small and have several limitations. The largest of the studies has less than 1,200 subjects and often multiple treatments are tried. By contrast, more than 20,000 adults and out-of-school youths who applied for the Job Training Partnership Act (JTPA) were randomly assigned to a "treatment group" or to a "control" group that was ineligible for JTPA-funded services. In addition, all family intervention evaluations were carried out in specific locations largely chosen for convenience (often close to the location of the PIs [Principal Investigator] University). Again, by contrast, the RCT for the JTPA trial was conducted in sixteen sites across the United States that were chosen in a systematic fashion. In general, consistent interviewing of study subjects as they develop is not conducted, making it difficult to understand the exact pathways through which these interventions work.

If, in fact, large-scale adoption of the NFP does occur as the Obama administration hopes, a research agenda that borrows from the experience of the JTPA is likely to be useful. We could make a great deal of progress if both experimental and nonexperimental data were collected on subjects. Nonexperimental data that follow very large samples that take up programs selectively can make an extremely valuable addition to RCTs, especially if pretreatment outcome factors are measured. Economists are exceptionally well positioned to help with analysis of both experimental as well as nonexperimental data and to help design creative evaluations that rely on variation that is other than random assignment. Economists may also be best positioned to conduct important cost-benefit and cost-effectiveness analysis,

which is rudimentary to date.[8] But unlike job training, exceptionally well-developed models and years of work in other fields are already established in this area and far exceed the current thinking in economics. The challenge will be to integrate the considerable skills that economists can bring to this area and for economists to be open to models that are quite foreign to economists as a rule. These include serious models on the development of what economists label "preferences," an area that economists have been reluctant to tackle until recently. Tackling this issue is highly relevant for public policy but is equally relevant for theory, economic and otherwise.

While we cannot yet answer the ultimate policy question of whether resources should be shifted from imprisonment and policing to early childhood intervention, there are several questions we can answer that inform this ultimate question. Both experimental evidence from programs such as the NFP and nonexperimental evidence from changes in divorce laws suggest that improved parenting may reduce criminality in offspring. Second, in assessing whether such a switch in resources would be cost-effective, the link between teen childbearing in girls and crime in boys is essential—assessing the cost-effectiveness with respect to crime would miss all of the cost-savings that would come from reducing teenage childbearing. While several studies, including some of my own, suggest that teen childbearing per se has little long-term costs to women or society, this statement is conditional on women arriving at the teen years having experienced enormous cumulative disadvantage relative to women who avoid teen pregnancy.[9] Women who become pregnant as teens have had such cumulative disadvantage prior to pregnancy (including, on average, bad parenting themselves) that much of the damage to life changes has already been done. Programs that focus on family support and parenting are aimed at mitigating this cumulative disadvantage at least in part. These factors almost certainly could lead to better life outcomes. While this chapter focuses on early childhood investment on antisocial behavior, in a series of papers, James Heckman has argued that through what he terms "socialization," these types of investment are also likely to improve schooling and labor market outcomes.[10] It is these factors that early child intervention programs are targeting, and their potential promise lies in the wide array of important outcomes that they may improve.

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8. For example, even the best cost-benefit analyses rely on calculating the discounted present value of costs and benefits for a cohort over a lifetime. An alternative way of thinking about the problem is that we are in an equilibrium that reflects our current high levels of crime in society. A universal and permanent implementation of a program would move society to a new lower equilibrium level of crime. In the new equilibrium, we would be expending resources on the young but gaining benefits from the old that had been previously treated (like in a social security system). The question then is how much does it cost annually to maintain this new equilibrium? This analysis would avoid tricky questions like the appropriate discount rate.

9. See Hotz, McElroy, and Sanders (2005) as one example.

10. See Heckman, Stixrud, and Urzua (2006) as one example.

References

Akerlof, George A., Janet Yellen, and Lawrence F. Katz. 1996. "An Analysis on Out-of-Wedlock Childbearing in the United States." *Quarterly Journal of Economics* 111 (2): 277–317.

Ananat, Elizabeth O., Jonathan Gruber, Phillip B. Levine, and Douglas Staiger. 2009. "Abortion and Selection." *Review of Economics and Statistics* 91 (1): 124–36.

Anderson, Elijah. 2000. *Code of the Street: Decency, Violence, and the Moral Life of the Inner City.* New York: Norton.

Bartik, Timothy J. 2009. "Estimated State and Local Fiscal Effects of the Nurse Family Partnership Program." Upjohn Institute Staff Working Paper no. 09-152. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

Becker, Gary S. 2000. "Guess What? Welfare Reform Works." *Hoover Digest* 1. Stanford, CA: Hoover Institution, Stanford University. http://www.hoover.org/publications/hoover-digest/article/7205.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How Much Should We Trust Differences-in-Differences Estimates?" *The Quarterly Journal of Economics* 119 (1): 249–75.

Brien, Micheal J. 1997. "Racial Differences in Marriage and the Role of Marriage Markets." *Journal of Human Resources* 32 (4): 741–78.

Caceres-Delpiano, Julio F., and Eugenio Giolito. 2011. The Impact of Unilateral Divorce on Crime. *Journal of Labor Economics*, forthcoming.

Donohue, John J. III, Jeffrey Grogger, and Steven D. Levitt. 2009. "The Impact of Legalized Abortion on Teen Childbearing." *American Law and Economics Review* 11 (1): 24–46.

Donohue, John J. III, and Steven D. Levitt. 2001. "The Impact of Legalized Abortion on Crime." *Quarterly Journal of Economics* 116 (2): 379–420.

Foote, Christopher L., and Christopher F. Goetz. 2005. "Testing Economic Hypotheses with State-Level Data: A Comment on Donohue and Levitt (2001)." Federal Reserve Bank of Boston Working Paper no. 05-15. Boston, MA: Federal Reserve Bank of Boston.

Freidberg, Leora. 1998. "Did Unilateral Divorce Raise Divorce Rates? Evidence from Panel Data." *American Economic Review* 88 (3): 608–27.

Gottfredson, Michael R., and Travis Hirschi. 1990. *A General Theory of Crime.* Stanford, CA: Stanford University Press.

Grogger, Jeffrey. 1997. "Incarceration-Related Costs of Early Childbearing." In *Kids Having Kids: Economic Costs and Social Consequences of Teen Pregnancy,* edited by Rebecca A. Maynard, 231–56. Washington, DC: Urban Institute Press.

Gruber, Jonathan. 2001. *Risky Behavior among Youths: An Economic Analysis.* Chicago: University of Chicago Press.

Heckman, James J., Jora Stixrud, and Sergio Urzua. 2006. "The Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social Behavior." *Journal of Labor Economics* 24 (3): 411–82.

Hotz, V. Joseph, Susan McElroy, and Seth Sanders. 2005. "Teenage Childbearing and Its Life Cycle Consequences: Exploiting a Natural Experiment." *Journal of Human Resources* 40 (3): 683–715.

Jonson-Reid, Melissa, Ned Presnall, Brett Drake, Louis Fox, Laura Bierut, Wendy Reich, Phyllis Kane, Richard D. Todd, and John N. Constantino. 2010. "Effects of Child Maltreatment and Inherited Liability on Antisocial Development: An Official Records Study." *Journal of the American Academy of Child and Adolescent Psychiatry* 49 (4): 321–32.

Joyce, Ted. 2004. "Did Legalized Abortion Lower Crime?" *Journal of Human Resources* 39 (1): 1–28.

———. 2009. "A Simple Test of Abortion and Crime." *Review of Economics and Statistics* 91 (1): 112–23.

Kitzman, Harriet, David L. Olds, Kimberly Sidora, Charles R. Henderson Jr., Carole Hanks, Robert Cole, Dennis W. Luckey, Jessica Bondy, Kimberly Cole, and Judith Glazner. 2000. "Enduring Effects of Nurse Home Visitation on Maternal Life Course: A 3-Year Follow-up of a Randomized Trial." *Journal of the American Medical Association* 283 (15): 1983–89.

Lee, Bong, and Robert George. 1999. "Poverty, Early Childbearing, and Child Maltreatment: A Multinomial Analysis." *Child and Youth Service Review* 21 (9/10): 755–80.

Loeber, R., and M. Stouthamer-Loeber. 1986. "Family Factors As Correlates and Predictors of Juvenile Conduct Problems and Delinquency." In *Crime and Justice: An Annual Review of Research*, vol. 7, edited N. Morris and M. Tonry, 29–149. Chicago: University of Chicago Press.

Manlove, Jennifer. 1997. "Early Motherhood in an Intergenerational Perspective: The Experiences of a British Cohort." *Journal of Marriage and Family* 59 (2): 263–79.

Moffitt, Robert. 1990. "The Effect of the U.S. Welfare System on Marital Status." *Journal of Public Economics* 41 (1): 101–24.

Moffitt, Terrie E. 1993. "Adolescence-Limited and Life-Course-Persistent Antisocial Behavior: A Developmental Taxonomy." *Psychological Review* 100 (4): 674–701.

Murray, Charles. 1984. *Losing Ground: American Social Policy, 1950–1980.* New York: Basic Books.

Nagin, Daniel S., Greg Pogarsky, and David P. Farrington. 1997. "Adolescent Mothers and the Criminal Behavior of Their Children." *Law and Society Review* 31 (1): 137–62.

Neckerman, Kathryn, and William J. Wilson. 1987. "Poverty and Family Structure: The Widening Gap between Evidence and Public Policy Issues." In *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy,* edited by William J. Wilson, 63–92. Chicago: University of Chicago Press.

Olds, David L., Charles R. Henderson Jr., R. Chamberlin, and R. Tatelbaum. 1986. "Preventing Child Abuse and Neglect: A Randomized Trial of Nurse Home Visitation." *Pediatrics* 78 (1): 65–78.

Olds, David L., Charles R. Henderson Jr., Robert Cole, John Eckenrode, Harriet Kitzman, Dennis Luckey, Lisa Pettitt, Kimberly Sidora, Pamela Morris, and Jane Powers. 1998. "Long-Term Effects of Nurse Home Visitation on Children's Criminal and Antisocial Behavior: Fifteen-Year Follow-Up of a Randomized Controlled Trial." *Journal of the American Medical Association* 280 (14): 1238–44.

Olds, David L., Charles R. Henderson, and Harriet Kitzman. 1994. "Does Prenatal and Infancy Nurse Home Visitation Have Enduring Effects on Qualities of Parental Caregiving and Child Health at 25 to 50 Months of Life?" *Pediatrics* 93 (1): 89–98.

Olds, David L., JoAnn Robinson, Lisa Pettitt, Dennis W. Luckey, John Holmberg, Rosanna K. Ng, Kathy Isacks, Karen Sheff, and Charles R. Henderson Jr. 2004. "Effects of Home Visits by Paraprofessionals and by Nurses: Age 4 Follow-up: Results of a Randomized Trial." *Pediatrics* 114:1560–68.

Parker, Karen F., and Amy Reckdenwald. 2008. "Concentrated Disadvantage, Traditional Male Role Models, and African-American Juvenile Violence." *Criminology* 46 (3): 711–35.

Pogarsky, Greg, Alan J. Lizotte, and Terence P. Thornberry. 2003. "The Delinquency

of Children Born to Young Mothers: Results from the Rochester Youth Development Study." *Criminology* 41 (4): 1249–86.

Rebellon, Cesar J. 2002. "Reconsidering the Broken Homes/Delinquency Relationship and Exploring Its Mediating Mechanism(s)." *Criminology* 40 (1): 103–36.

U.S. Department of Health and Human Services. 2001. *Youth Violence: A Report of the Surgeon General.* Washington, DC: U.S. Department of Health and Human Services.

Wolfers, Justin. 2006. "Did Unilateral Divorce Laws Raise Divorce Rates? A Reconciliation and New Results." *American Economic Review* 96 (5): 1802–20.

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Seth Sander's chapter concludes that policymakers are considering large-scale early-childhood education programs to promote children's self-control skills, with the aim of reducing the crime rate and improving citizens' health and wealth as well. Experiments and economic models suggest such programs could reap benefits. Yet evidence is needed that self-control is truly important for the health, wealth, and public safety of the population. By following a cohort of 1,000 children from birth to age thirty-two, we show here that childhood self-control predicts physical health, substance dependence, personal finances, and criminal offending outcomes, following a gradient of self-control. In another cohort of 500 sibling pairs, the sibling with lowest self-control had poorest outcomes, despite both siblings sharing their family background.

Economists, including the authors of chapters in this book, are drawing attention to individual differences in self-control as a key consideration for policymakers who seek to enhance the physical and financial health of the population and reduce the crime rate (Heckman 2007). The current emphasis on self-control skills of conscientiousness, self-discipline, and perseverance arises from the empirical observation that preschool programs that targeted poor children fifty years ago, although failing to achieve their stated goal of lasting improvement in children's intelligence quotient (IQ) scores, somehow produced by-product reductions in teen pregnancy, school

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