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WELFARE REFORM AND JUVENILE ARRESTS

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ABSTRACT

Social policy, such as the legalization of abortion and the federal bans on lead in the 1970s, has been shown to significantly impact crime rates. With recent increases in juvenile arrests and violent crime rates, we explore whether further social policy—namely the 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) welfare reform—has had an impact on crime.

There are various mechanisms by which the Temporary Assistance for Needy Families (TANF) program, created by the 1996 PRWORA welfare reform, may influence criminal activity, especially among older children. Many welfare recipients were required to participate in work and education activities, which have a theoretically ambiguous effect on children. For example, work and education activities may increase household income and parental confidence. Increased resources and positive role modeling would both be expected to lower the risk of problem behaviors and delinquent activity for their children. Conversely, work requirements reduce the amount of time a parent spends in the home and may reduce the amount of supervision a child receives, particularly for older children who do not qualify for childcare benefits. Previous research has suggested a link between decreased parental supervision—especially that of the mother—and criminal behavior. TANF reforms may also lead to less overall income for families if reduced cash payments are not offset by employment earnings. The shift toward greater TANF spending on work supports (e.g. transportation and child care for younger children) and less cash assistance may have left families with fewer total resources, making crime and delinquency more attractive for older children.

To determine the impact of the PRWORA reform on juvenile crime, we utilize a 1990 to 2006 panel of data to estimate state-level arrest statistics as a function of how stringent the work requirements were for adults parents of children aged 13 to 15. For comparability with the prior literature and to address the broader issue of the array of factors that influence crime rates, we closely follow the well-established crime and delinquency literature when selecting control variables.

Our results suggest that stricter work requirements experienced by 13 to 15 year-olds increase their violent crime activity 2 to 4 years later. An increase of one standard deviation in the severity of the work requirement policy results in 5.5 more annual violent crime arrests per capita, an 14.5 percent increase. These results indicate that states should consider options for mitigating these effects, such as support services targeted at teenagers, when implementing the stricter federal work requirements outlined in the Deficit Reduction Act (DRA) of 2005. Conversely, we find no effect of welfare work requirements on juvenile property crime arrests, consistent with the literature on crime and delinquency among juveniles of low-socioeconomic status.

INTRODUCTION

Considering that certain social policies, such as the legalization of abortion and the federal bans on lead in the 1970s, have been associated with significant reductions in crime, it is possible that other social policies similarly affect criminal activity and may help to explain the recent increase in both juvenile arrests and violent crime rates. We assess whether the welfare policies that children are exposed to in their early teen years affect criminal activity 2 to 4 years later when the cohort is of primary age for juvenile criminal activity.

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA)¹ welfare reforms of 1996 represented a major shift in social policy. PRWORA was intended to eliminate the entitlement regime of guaranteed cash payments for poor families, especially single mothers, as imparted under Aid to Families with Dependent Children (AFDC). Instead, with the passage of PRWORA, Congress imposed conditions on welfare recipients such as mandatory work and education requirements and time limits for participation under the Temporary Assistance for Needy Families (TANF) model. Under TANF, states are given block grants to administer welfare funds, whereas AFDC was a federal assistance program. The effects of this policy change on children are not well understood. The existing evidence suggests that there was a positive or no effect on outcomes for elementary-school-aged children (Miller and Zhang, 2007; Duncan and Chase Lansdale, 2001; Barbour, Bruce, and Thacker, 2003). Results are sparse and mixed for older children. Studies find a decline in the academic performance of adolescents (Grogger et al, 2002), an increase in school enrollment and decrease in drop-out rates (Miller and Zhang, 2008), and an increase in the incidence of “substantiated mistreatment” of children (Paxson and Waldfogel, 1999).

¹ Pub.L. 104-193, 110 Stat. 2105, enacted August 22, 1996.

There are various mechanisms by which the TANF program may influence criminal activity, particularly among older children. As a result of welfare reforms,² most welfare recipients were required to participate in some form of work activity. Allowable activities vary by state and include employment, job search, education, and community service. Imposition of work requirements is likely to affect household resource levels, parental skills and attitudes, time spent supervising children, and household location decisions. Each of these factors has been shown to affect juvenile delinquency and criminal activity.

Research indicates that economically disadvantaged children are at higher risk for criminal activity (e.g. Comanor and Phillips, 2005; Levitt and Lochner, 2001). Ex ante, it is unclear whether welfare reforms should increase or decrease household income and juvenile crime. Work requirements led states to reduce direct cash benefit payments and increase funding for support services, such as transportation and childcare, that facilitate work activities (Baider et al., 2007; Richards, Bruce, and Thacker, 2004). This change likely represents fewer resources being spent on older children, as the support services are typically focused on adults and younger children.³ Work requirements are also likely to increase employment among those receiving assistance, which would increase household income as long as those earnings were not offset by losses in benefits from welfare and other assistance programs. Ziliak (2003) finds that the declines in cash benefits were not fully offset by other income sources, leaving these households with fewer net resources.

² Some states implemented reforms through state waivers prior to TANF legislation. We account for pre-TANF waivers using indicator variables, as outlined in our empirical methods below.

³ Children age out of the child care subsidies between 12 and 13 years old. Additionally, welfare recipients often cite lack of child care availability (regardless of whether a subsidy is available) as an important barrier to work (Richards, Bruce, and Thacker, 2004). It seems plausible faced with a shortage of daycare options, parents would first place younger children in child care leaving pre-teens without care or in more informal care situations.

Effects of welfare reform on parental education, skills, and time use may also have conflicting effects on juvenile crime. Increases in education or skills have been shown to reduce criminal activity. Mocan and Rees (2005) find that the education levels attained by parents, particularly that achieved by a mother, are important for determining female crime. In addition, increased employment or education among parents could lead to increases in self-confidence and positive role-modeling, which may encourage their children to pursue activities that are likely to increase their employability (such as education) and make delinquency and criminal activity less attractive.⁴

Welfare reforms, and work requirements in particular, could potentially have a sizeable impact on the time-use patterns of recipient parents, requiring many welfare recipients to be away from the home for significant periods of time. More time spent at work as well as work during non-traditional hours could dramatically reduce parental supervision. Previous research has linked lack of supervision with criminal behavior (Mocan and Rees, 2005; Sampson and Laub, 1993; Widom, 2000). The effects of low levels of adult supervision seem to be particularly acute among urban children living in dangerous neighborhoods (Hoffman, 2003) and those living in neighborhoods of low sociodemographic status (Beyers et al., 2001).⁵

The work requirements may have also spurred relocation by welfare recipients to regions undergoing an economic expansion. Kling, Ludwig, and Katz (2005) use data from a randomized housing voucher experiment to examine the effects on youth from relocating to lower-poverty areas. They find that the relocation of female youth to lower-poverty areas reduces their arrests for violent and property crime. The results for relocated male youth are mixed, as they exhibit short-term reductions in violent crime but engage in more problem

⁴ Of course, there could be negative employment affects on parents such as increased stress levels or frustration over thwarted aspirations of advancement beyond entry-level employment.

⁵ Also see Schonberg (2007) for research on the effects of socioeconomic factors on child conduct problems.

behavior and property crime. Dembo et al. (1993) find that juvenile males with delinquent lifestyles and peer influences are more prone to problem behaviors whereas problem behaviors by juvenile girls often result from traumatic family experiences.

Identifying the potential effects of welfare reform on crime is especially urgent as states are working to implement stricter minimum work participation requirements enacted in the Deficit Reduction Act (DRA) of 2005.⁶ The DRA counts both TANF recipients and recipients in state-funded programs when calculating work participation rates, which reduces a state's flexibility in determining who should be subject to work requirements (Baider, et al., 2007).⁷ The DRA also imposes stricter reporting requirements and narrower definitions for work activities. Single-parents are required to participate in work activities at least 30 hours per week (20 hours if a child under the age of six is present) (Baider, et al., 2007).

We focus our analysis on the welfare effects associated with juveniles ages 13 to 15 for three reasons. First, these are the age groups most likely to be affected by the restructuring of welfare benefits, particularly the reduction in parental supervision without an offsetting service for after-school time as daycare benefits phase out between 12 and 13 years of age. Second, there have been significant changes in juvenile crime rates (as measured by arrest data) in the post-reform period, and these changes are affecting overall crime statistics. Finally, there are a sufficient number of post-reform years to examine arrest trends for this group.

CRIME AND ARREST TRENDS

Violent crime rates increased in 2005 for the first time in more than a decade (see Figures I and II), while property crime rates continue to decline (Figures III and IV). Although much

⁶ Pub.L. 109-171, 120 Stat. 4, enacted February 8, 2006.

⁷ Prior to the DRA of 2005, those receiving benefits under programs funded solely by the state were not included in calculating work participation rates.

research has been published that examines the factors driving changes in crime rates, nothing in the previous literature would suggest the recent increase in violent crime. Levitt (2004) concluded that the falling crime rates in the 1990s were mostly attributable to four factors: more police, increased incarceration, the ebbing crack epidemic, and legalized abortion. Looking forward, he predicted a 10-15 percent reduction in crime from 2001 to 2010.⁸ Further, commonly cited factors, such as economic conditions, demographics, gun control, and death penalty policies, did little to explain falling crime rates, according to Levitt (2004) and Reyes (2007).

Nevin (2000) argues that lead exposure amongst children is a major determinant of crime.⁹ Reyes (2007) found that the ban on lead in gasoline led to lower crime rates in the 1990s, with diminishing childhood lead exposure linked to the 56 percent drop in violent crime. However, CDC data suggests a significant decline in blood lead levels in children since the federal bans in the 1970s, thereby exculpating lead exposure as a cause of the recent increase in juvenile crime (Reyes, 2007).

Violent crime rates are still quite low by historical standards so the recent uptick may not be particularly troubling if not for the rapid increase in the number of juvenile arrests for violent crimes. In particular, arrest data indicate that juvenile offenders are likely driving the increase, which began as early as 2002 according to the arrest data. This trend suggests that violent crime rates may continue to increase as juvenile offenders become adults.

⁸ Levitt (2004) cites the uncertainty from linger effects of the crack epidemic (as effected babies grow into prime crime years) but the available evidence suggests only short-term physiological impacts of pre-birth crack exposure (Frank, Augstyn, Knight, Pell, and Zuckerman, 2001). Nonetheless, controls for lagged crack exposure will be included in the empirical analysis as Donohue III and Levitt (2004) show that omitting such controls can significantly alter results as in Joyce (2003).

⁹ High blood lead levels (BLLs) in children are associated with diminished neurological development and subsequent delinquent behavior amongst adolescents (Wakefield, 2002).

Arrest data broken down by age of offender indicate a dramatic increase in the number of juveniles arrested for murder and robbery, particularly female juveniles. Although the total number of juvenile arrests in 2005 increased only slightly (0.2 percent) from the 2004 figure, arrests for murder rose 7.3 percent. From 2001 to 2005, arrests of female juveniles increased by 19.7 percent for murder and 23.4 percent for robbery. Corresponding increases for male juveniles were 15.3 percent for murder and 12.5 percent for robbery.

Trends in violent crime and arrest rates are consistent with the potentially negative effects of welfare reform outlined above, reduced resources available to older children, and reduced levels of adult supervision for older children due to parental hours spent outside of the home. Violent crime rates began to rise in 2005 and as the prime ages for criminal activity are 18 to 24 years, the cohort of prime age during the increase would have been 10-16 years old during the 1996 reforms. Murder and robbery arrest rates for male juveniles began increasing in 2005, and was likely driven by those boys who were 7 to 9 years old in 1997 (the prime age range for juvenile arrests for violent crime is 15 to 17 years). Interestingly, robbery arrest rates for juvenile females began rising in 2002 (girls who were 10 to 12 years old in 1997) and murder arrests began climbing in 2004 (girls who were 8 to 10 years old in 1997) and grew at a much faster rate than those for males, perhaps suggesting that the impact on females was greater and more immediate. Differences in male and female juvenile arrest rates have been noted by other researchers. Veysey (2003) notes that arrests among juvenile girls increased by 45 percent from 1989 to 1999 while Snyder (2000) reports that male juvenile arrests decreased by nearly 10 percent over the same period. Increased criminal activity among young women is also reflected in a more than 65 percent increase in detention rates between 1988 and 1997 (Porter, 2000).

Figures V through VIII indicate two interesting trends in juvenile arrests from 1991 to 2006. First, the number of violent crime arrests rose more rapidly in southern states than in other regions. This divergence across states is consistent with the stricter work requirement policies and high concentrations of poverty in southern and Appalachian states. Second, property crime arrests continue to decline as violent crimes increase. Previous research provides guidance in reconciling these diverging trends, as does the finding in Miller and Zhang (2008) that welfare reforms improved school attendance and reduced dropout rates. In fact, the welfare-induced positive outcome of increased school participation is likely to be contributing to both the increase in violent crime and the decrease in property crime. To understand this effect, consider that different factors affect property crime and more serious and costly violent crimes. A key to deterring property crime is incapacitation, or increased time spent in structured or monitored activities (Jacob and Lefgren, 2003). However, violent crime is more closely tied to social interaction or concentration—specifically, a concentration of juveniles in a given location, including school, increases the occurrence of violent crime (Jacob and Lefgren, 2003; Gottfredson and Soulé, 2005). In terms of costs, Jacob and Lefgren (2003) find that the gains from reductions in property crime are swamped by the increased costs associated with violent crime.

To illustrate how this unintended consequence of welfare-reform might occur, consider a hypothetical single woman who prior to TANF reforms was a stay-at-home mother to a six-year-old girl and thirteen-year-old boy. After reforms, the mother begins working full-time outside of the home. Between commuting and working, the mother is absent from the home from 9:00 AM to 6:30 PM. The younger child attends school and qualifies for subsidized childcare services during non-school working hours. The mother insists that the older child attend school more

regularly than he did prior to reforms because she will not be home to supervise him, and because she has a heightened regard for education as a result of her labor-force participation. Increases in school attendance lead to stronger social connections for the teenager. As the thirteen-year old approaches prime juvenile crime years (15 to 17), he has stronger social connections from his increased school attendance and no structured activities or responsibilities during the primary time for juvenile offenses, which is between 3 and 6 PM (Snyder and Sickmund, 2006). Due to the lack of parental supervision, he is more susceptible to delinquency and criminal activity.

BACKGROUND: WELFARE REFORM AND POLICIES IN FIVE APPALACHIAN STATES

The modern government assistance programs, commonly called “welfare,” have evolved from the Aid for Dependent Children (AFDC) Act signed into law by President Roosevelt in 1935. This act was designed to provide cash assistance for needy children, typically those with single mothers. In the 1980’s, President Reagan reduced federal welfare spending, in particular by reducing benefits to AFDC recipients who worked. States were given the option of requiring the majority of welfare recipients to participate in “welfare-to-work” programs.¹⁰ However, the program proved unsuccessful at least in part due to both a lack of funds to implement the programs and work disincentives that resulted from high effective tax rates. Only one in five eligible recipients was enrolled in a training program by 1993.

In 1996, the welfare reform legislation, Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), dramatically changed the way assistance was provided to needy families. Responsibility for the administration of benefits shifted to the states, as the federal

¹⁰ During this time, 40 states set up these “welfare-to-work” programs that provided education and training to welfare recipients. The federal Family Support Act of 1988 (23 U.S.C.A. § 125) mandated that all states phase in comprehensive welfare-to-work programs by 1990.

government provided states with block grants known as Temporary Assistance to Needy Families (TANF). The TANF funds did have some restrictions—states were required to impose work requirements on recipients, and a family could not receive TANF benefits for more than 5 years.

Under TANF, the work requirements became more stringent. Heads of single-parent families were required to participate in a work activity at least 20 hours per week (e.g., employment, job search, on-the-job training, work experience, community service, up to 12 months of vocational training, or providing child care services to individuals who are participating in community service). Under AFDC, for fiscal year 1994, 15 percent of non-exempt recipients were required to participate in work-related activities for at least 20 hours per week; however there were no statutory single-parent standards after fiscal year 1995, where 20 percent of non-exempt recipients were expected to participate in these activities.¹¹ Under TANF, states must demonstrate that they require families to work within two years of receiving assistance, and also must meet the annual work participation rate determined by the federal government. This rate has increased semi-annually since 1996, and as of 2005, fifty percent of a state's single-parent caseload was required to work a minimum of 30 hours per week.¹²

The Deficit Reduction Act of 2005 (DRA) reauthorized the TANF program and substantially tightened work-related policies. Among other requirements, the law narrowed the definition of work activities and imposed new penalties for noncompliance with work

¹¹ Individuals were exempt from these requirements if they were: ill, incapacitated, or aged; had a child under age 3 (or 1 at state option); were under age 16 or in school full-time; were in the 2nd or 3rd trimester of pregnancy; were needed in the home to care for an ill or incapacitated family member; were employed 30 hours or more per week; resided in an area where the program was not available; or was providing care to a child under 6 and child care would not be guaranteed.

¹² Single parents with a child under age 6 are deemed to be meeting the work requirements if they work 20 hours per week. However, single parents of children under age 6 who cannot find child care cannot be penalized for failure to meet work requirements, and states can exempt from the work requirement single parents with children under age 1 and disregard these individuals in the calculation of participation rates for up to 12 months.

verification plans. Although many work-related rules remained the same, such as who is exempt from work, the number of work hours required, and the minimum sanctions for noncompliance, it is anticipated that states will continue to legislate changes to their policies based on the DRA for many years to come.

A key component of the 1996 welfare reform was the devolution of responsibility for implementing TANF programs to the states, and these state-level policies provide the variation needed for our empirical analysis below. Table 1 illustrates how policies differ among five neighboring Appalachian states¹³:

Of the five states, all have work requirements of at least 30 hours per week and one state, Tennessee, requires 40 hours per week. The states vary in their treatment of training hours—West Virginia and Virginia do not limit the number of training or education hours per week that may be applied to meeting the work requirement, while Kentucky, North Carolina and Tennessee limit those hours to anywhere between 10 and 20 hours per week. The sanctions for noncompliance, too, vary among the states, and range from withholding benefits until compliance is reached to canceling the benefits outright.

Table 2 illustrates that work requirements are generally more stringent in southern states.¹⁴ In 1998, 25 percent of Southern states required 30 or more hours of work as compared to 17 percent of non-Southern states. By 2006 these numbers had increased to 93.75 percent and 71.43 percent for Southern and non-Southern states, respectively.¹⁵ Southern states also had higher mean sanction rates, more than 20 percentage points higher on average. The timing of

¹³ Entries are for single-parent welfare recipients not exempt from work requirements in 2005.

¹⁴ Policies discussed in Table 2 represent the requirements for a single parent with no child under the age of six and sanctions are those applied when the case first becomes non-compliant. Southern states include Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

work requirements is not as stringent in the South, where 75 percent of states in 2006 required immediate work to receive benefits, whereas 86 percent of non-Southern states had immediate work requirements but the difference is only statistically significant in 2006.

DATA AND EMPIRICAL METHODS

We use the variation in the stringency of work requirement policies across states as well as variation over time within states to identify the effects of welfare reforms on juvenile arrest rates. Our state-level data span 1990 through 2006 and include crime and arrest statistics, welfare policy information, state-level economic conditions, and other control variables.¹⁶

In the spirit of Donohue III and Levitt (2001) and Reyes (2007), we estimate a panel regression of the following form:

$$\ln(\text{arrest}_{st}) = \beta_1 WRS_{st_{teen}} + \beta_2 WRS_{st_{teen}} * \text{poverty}_{st-1} + X\theta + \mu_s + \lambda_t + \varepsilon_{st}.$$

Arrest is the violent or property juvenile arrest rate for state *s* at time *t*. *WRS* is an index measuring the average work requirement stringency (*WRS*) in state *s* for affecting children aged 13-15 (lagged 2 to 4 years). The second term interacts the *WRS* index with the percent of state *s* population under the poverty line. *X* is a set of control variables including state-level economic variables, presence of concealed handgun laws, and prisoners and police per capita. We also include state-level effective abortion rates given the findings of Donohue III and Levitt (2001). We estimate equation [1] using weighted least squares (WLS) based on state population. Fixed effects are included for state and year and we correct for serial correlation in the panel data.

Constructing the Work Requirement Stringency (WRS) Index

Measures of welfare stringency are not unprecedented in the literature. Soss et al. (2001) present a four-factor measure of welfare stringency based on sanctions time limits, work

¹⁶ See the Data Appendix for more information on data sources.

requirements, and family caps. De Jong et al. (2006) consider 78 state policy guidelines and ultimately settle on 15 first-order dimensions. We elect to create our own measure of stringency because our focus is on policies related to work requirements and sanctions for noncompliance.

Like Soss et al. (2001) we create an additive index of our three factors. First, states are assigned values of 0 to 2 based on their hours requirements (less than 20 hours = 0, 21 to 30 hours = 1, more than 30 hours = 2), the timing of their work requirements (greater than 6 months or unspecified = 0, 2 to 6 months = 1, one month or less = 2), and two dimensions of sanction policy, percent of sanction (30 percent or less = 0, more than 30 percent to 74 percent = 1, greater than 74 percent = 2) and duration of sanction (none or compliance = 0, up to one month = 1, more than one month = 2). Figures IX and X present the mean values of the index and growth rates in the index over time. Severity of work requirement policies increased over the time period but most all of the increases occurred in the early years of implementation, before 2002. On average, policies were stricter in southern states.

Adjustment for Affected Population

The size of the affected population is a key question in assessing whether effects of work requirement stringency are detectable at the state level. We include the *WRS*poverty* interaction to estimate the effects scaling for the size of the affected population. The poverty rate is used in the baseline specification instead of welfare participation rates as the work requirement policy variables might affect those enrolled in welfare as well as those who might choose not to enroll in the program because of the work requirements. In fact, there were significant declines in welfare participation in the years following TANF reforms.

Focus on Juvenile Arrest Rates

We focus on juvenile arrests for several reasons. First, we are interested in examining the effects of work requirement policies on the future criminal activity of 13 to 15 year-olds. We assess whether the policies that children are exposed to in their early teen years affect criminal activity 2 to 4 years later when the cohort is of primary age for juvenile criminal activity. Juvenile crime effects are of particular interest given the recent trends that show rapid increases in juvenile arrests, particularly for violent crime. As juvenile crime is correlated with adult criminal behavior, these trends are likely to be manifested in crime statistics over the next few years. Data availability, namely the newness of welfare reforms, also limits our ability to estimate the effects on younger age groups (5 to 7 year lags for 10 to 12 year-olds) or use crime rates (7 to 9 year lags for 13 to 15 year-olds) as our dependent variable.¹⁷ Summary statistics for estimation variables are presented in Table III.

RESULTS

Main results are presented in Table IV. All specifications include state and year effects, specification (1) is estimated using WLS and includes the work requirement stringency index (WRS Index) averaged over the 2 to 4 years preceding the arrest time period and the index-poverty interaction. The coefficient on the welfare index indicates that a ten percentage point increase in the work requirement index results in a 4.9 percent increase in juvenile violent crime arrests per capita 2 to 4 years later.¹⁸ The coefficient is significant at the one percent level. Specification (2) includes the index variables in addition to the full set of control variables and results are similar, indicating that a one standard deviation increase in the work requirement

¹⁷ Arrest statistics are available by age of the offender, unlike crime data but they also have some limitations. For instance, juveniles may be more likely to commit crimes in groups (Greenwood, 1995) so that arrest statistics overstate crime. In addition, changes in arrest activity may be attributable to changes in enforcement effort. This concern should be somewhat mitigated by our inclusion of the number of police as a control variable and is likely to be less important for violent crimes where enforcement efforts are presumably high.

¹⁸ We ignore the coefficient on the interaction term as it is essentially zero.

index results in 4.9 more juvenile arrests per capita for violent 2 to 4 years later. Columns (3) and (4) replace the poverty interaction with a density measure. We include this specification as the effects of lower supervision might be magnified in areas of high welfare population density where there would have been more adult interaction with, and supervision of, neighborhood children prior to work requirement policies. Coefficients are smaller and only statistically significant in the full control specification.

Interestingly, we do not find the negative effects of the effective abortion rate presented in Donohue and Levitt (2001) (and subsequent replies to comments, Joyce, 2003; Donohue and Levitt, 2004; Foote and Goetz, 2008; Donohue and Levitt, 2008). Our coefficient is essentially zero although it is positive and statistically significant. One source of the difference could be the different time periods as we use 1990 to 2007 data and Donohue and Levitt used 1985 to 1997 data. Additionally, our data are more recent than the period when the 1970s policy change would be expected to have the largest impact.

We also find a large negative coefficient on our employment variable, which differs from much of the crime literature that finds little effect of economic conditions on crime or arrests. One possible explanation is that we are using the growth in nonfarm employment instead of the unemployment rate. Nonfarm employment growth seems to be a simpler indicator of economic conditions as it is not affected by changes in both a numerator and denominator like the unemployment rate. Income per capita in constant thousands of dollars also has a negative and significant effect on violent crime rates.

Several robustness checks are presented in Table V. Columns (1) and (2) contain the unweighted poverty and density specifications. Results are similar to those of the weighted models presented in Table IV. Columns (3) and (4) include both weighted and unweighted

welfare population specifications. These specifications are presented as an alternative to approximating the affected population by the poverty rate. The null of no effect from lagged work requirement policies cannot be rejected in either specification. However, this is not entirely unexpected given the large declines in welfare participation rates without accompanying increases in low-income household incomes. Columns (5) and (6) include dummy variables indicating whether the state was operating under an AFDC waiver between 1992 and 1996 that allowed states to impose more strict work requirements. Inclusion of waiver indicators (lagged 2 to 4 years) leaves the welfare index results essentially unchanged. The coefficient on the waiver dummy is positive and significant at the 5 percent level, consistent with our finding that exposure to increased work requirement stringency among 13 to 15 year-olds leads to higher rates of violent crime arrest 2 to 4 years later. Columns (7) and (8) include the welfare index term for 10 to 12 year-olds. In this specification we cannot reject the null that the coefficients on the welfare index variables for “tweens” are zero. This is not entirely unexpected as the time elapsed with welfare reform is simply not long enough to get reliable estimates of the arrest affects for 10 to 12 year-olds.

Instead of the lagged average of the welfare index for 13 to 15 year-olds, the specifications in Table VI include “years since reform” variable, defined as the number of years since the state implemented TANF or began operating under an AFDC waiver. Also included is an interaction of this variable with the average value of the welfare index over the years since reform. The coefficients on these variables are positive but not statistically significant serving as preliminary evidence that there may not be a cumulative effect of welfare reform. However, more years of data are needed to fully assess this hypothesis

Table VII contains our main specifications for juvenile property crime arrests. Results for the effects of work requirement policy on property crime arrests are mixed. In the poverty-interaction model, we cannot reject the null that work requirement policies had no effect on the future juvenile crime activity of 13 to 15 year-olds. There is a positive and statistically significant effect of the welfare index but a negative coefficient on the interaction term in the density-interaction specification. In effect, densely populated states with work requirements have lower rates of property crime but the overall effect of more stringent work requirement policies and more dense population is an increase in juvenile property crime rates.

CONCLUSIONS AND FUTURE WORK

We find that work requirement policies implemented under TANF increase juvenile crime arrests 2 to 4 years later. In our baseline specifications, we find no statistically significant effects of work requirement policies on property crime. Although our reduced form specification does not allow us to pinpoint the specific mechanisms through which these effects operate, there are three main possibilities. First, work requirements change parental time allocation and likely lead to a reduced ability to supervise older children (13 to 15) who are not eligible for childcare benefits. Second, the shift from cash benefits to work supports, primarily childcare and transportation, might cause a reallocation of resources within the household, leading to reduced resources available for the benefit of older children. In addition, research suggests that welfare reforms have resulted in lower overall income levels for welfare households (Ziliak, 2003). Finally, welfare reforms have been associated with increased school attendance, which in turn, increases the incidence of juvenile violent crime (Miller and Zhang, 2008; Jacob and Lefgren, 2003; Gottfredson and Soulé, 2005).

Our results provide insight into the recent increase in violent crime, especially among juveniles as measured by arrest rates. The finding that social policy affects criminal activity is consistent with a growing literature that addresses the effects of abortion legalization and childhood lead exposure. From a policy perspective, our findings highlight the importance of taking a broad approach when considering the consequences of policy changes. Although welfare reforms are associated with increased school participation, the net effect on children aged 13 to 15 is likely to be negative given the increased societal costs due to more juvenile violent crime.

Future work should assess what other policy changes, such as increasing the number of police or providing services for early teens during prime crime periods, could be used to offset the effects of work requirement reforms on juvenile crime. Other expansions include estimating the effects of work requirement policies on adult crime, examining effects by race and gender, and estimating the effects on younger children as more data becomes available. In addition, analysis at a smaller geographic region, such as cities, could be used to assess whether the effects are greater in areas with high concentrations of welfare recipients.

DATA APPENDIX

Crime and Arrests

All crime and arrest data by state and year are from *Crime in the United States* (annual) by the Federal Bureau of Investigations.

Welfare Rules

The welfare rules are from the *Welfare Rules Databook: State TANF Policies* (annual) by the Urban Institute. AFDC waiver dates and TANF start dates are from Miller and Zhang (2008). Sanction dates are from *State Implementation of Major Changes to Welfare Policies, 1992 – 1998* by the Office of Human Services Policy under the U.S. Department of Health and Human Services.

AFDC and TANF Populations

The AFDC and TANF population data by state and year are from *TANF Caseload Data* (annual) by the Administration for Children and Families.

Abortions

Abortion data by state and year are collected by the Bureau of the Census in the *United States Statistical Abstract* (annual) and by the Center for Disease Control and Prevention in the *Abortion Surveillance Report* (annual). Abortion rates are measured as abortions per 1000 live births.

Crack Impact

Data on the impact of crack are from the state level crack proxy used by Fryer, Heaton, Levitt, and Murphy (2005). While the city level crack proxy includes more indicators, the state level crack proxy must be used given the nature of our research.

Live Births

Live births data by state and year are from the *United States Statistical Abstract* (annual) by the Bureau of the Census.

Income

Per capita income data by state and year (adjusted to year 2000) are from the *United States Statistical Abstract* (annual) by the Bureau of the Census.

Consumer Price Index

The CPI is from the *United States Statistical Abstract* (annual) by the Bureau of the Census.

Unemployment

Unemployment data by state and year are from the *Current Population Survey* (annual) by the Bureau of Labor Statistics, based on the total number of unemployed noninstitutional civilians older than 16.

Poverty

Poverty data by state and year are from the *United States Statistical Abstract* (annual) by the Bureau of the Census, based on persons below the poverty level.

Law Enforcement

Law enforcement data by state and year, including police data, are from *Justice Expenditure and Employment* (annual) by the Bureau of Justice Statistics.

Prisoners

Prisoner data by state and year are from *Correctional Populations in the United States* (annual) by the Bureau of Justice Statistics.

Alcohol Consumption

Alcohol consumption data by state and year are from *Apparent Per Capita Alcohol Consumption: National, State, and Regional Trends, 1970–2005* by the National Institutes of Health and from the *Brewer's Almanac* (annual) by the Beer Institute.

Population Data

Data on population by age, foreign born population, and population densities by state and year are from the *United States Statistical Abstract* (annual) by the Bureau of the Census. Data on the foster care population are from the Administration for Children and Families. Migration data are from the U.S. Census.

Handgun Laws

Data on concealed weapons permits by state and the year of implementation are from Lott and Mustard (1997).

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APPENDIX

TABLE I
WORK-RELATED ACTIVITY REQUIREMENTS FOR SINGLE-PARENT UNIT HEADS

State	Timing of Requirement, Minimum Hour Requirement	Allowable Activities	Limit on Education/Training Hours	Unit Head Exempt or Has Good Cause for Noncompliance If:	Most Severe Sanctions for Noncompliance with Work Requirements
KY	Immediately upon receipt of benefits, 30 hours per week	All, including (but not limited to) job skills training, job search, education and training, subsidized employment and community service	10 hours per week	Ill or incapacitated or caring for such a person; 60 years of age or older; Caring for a child under the age of 1 (limited to 12 months over lifetime of recipient)	Entire benefit withheld until compliance
NC	Within 12 weeks of receipt of benefits, 35 hours per week	All, including (but not limited to) job skills training, job search, education and training, subsidized employment and community service	15, if children are not younger than 6 years old	Caring for a child under the age of 1 (limited to 12 months over lifetime of recipient)	Case is closed (if noncompliant for 3 months) and recipient must reapply for benefits
TN	After assessment, 40 hours per week	All except subsidized employment	20 hours per week	Ill or incapacitated or caring for such a person; 60 years of age or older; Caring for a child under the age of 1	Entire benefit withheld for 3 months or until compliance, whichever is longer
VA	Immediately upon receipt of	All, including (but not	No limit	Ill or incapacitated or	Entire benefit withheld for 6

	benefits, 30 hours per week	limited to) job skills training, job search, education and training, subsidized employment and community service		caring for such a person; 60 years of age or older; In the 4 th month or later of pregnancy; Caring for a child under the age of 18 months (with certain restrictions)	months or until compliance, whichever is longer
WV	24 months after receipt of benefits, 30 hours per week (20 hours per week if children are under 6 years old)	All, including (but not limited to) job skills training, job search, education and training, subsidized employment and community service	No limit	Ill or incapacitated or caring for such a person; 60 years of age or older; Pregnancy status only under certain circumstances; Caring for a child under the age of 1 (limited)	Entire benefit withheld for 3 months or until compliance, whichever is longer

TABLE II
TRENDS IN WORK REQUIREMENT AND SANCTION POLICIES

States	1998			2006		
	30 or More Hours	Immediate Work Requirement	Sanction Percent	30 or More Hours	Immediate Work Requirement	Sanction Percent
Southern States	25	56.25	62.74	93.75	75	72.92
All Other States	17.14	82.86	40.18	71.43	85.71	45.77

NOTES. Bold type indicates that differences are statistically significant at the 5 percent level. Table entries are percent of states except for sanction percent, which is a mean.

TABLE III
SUMMARY STATISTICS REGARDING
JUVENILE VIOLENT ARREST RATES

VARIABLE	MEAN	STD. DEV.
Juvenile Violent Arrest Rate	3.443	0.651
WRS Index	0.236	0.295
WRS-Poverty	2.858	3.685
Effective abortion	61.777	49.255
Log prisoners per capita	5.881	0.509
Log police per capita	5.626	0.202
Employment growth	0.015	0.018
Log income per capita	25.936	4.351
Poverty rate	12.828	3.792
Concealed weapons law	0.797	0.402
Population density	2.420	8.104
Welfare Population	3.017	2.084

NOTES. The data include state and year observations for all states from 1990 to 2006 (716 observations with some missing variables). Variables are defined in the Data Appendix. Income is in thousands of constant dollars.

TABLE IV
REGRESSION RESULTS FOR THE IMPACT OF WORK REQUIREMENT STRINGENCY ON
JUVENILE VIOLENT ARREST RATES

	POVERTY INTERACTION		DENSITY INTERACTION	
	(1)	(2)	(3)	(4)
WRS Index	.487 *** (.140)	.493 *** (.154)	.159 (.114)	.213 * (.113)
WRS-Poverty	-.033 *** (.012)	-.035 ** (.014)		
WRS-Density			-.029 ** (.012)	-.066 *** (.017)
Effective abortion		.006 *** (.001)		.001 *** (.001)
Log prisoners per capita (lagged one year)		.093 (.111)		-.026 (.112)
Log police per capita (lagged one year)		-.378 (.252)		-.468 * (.267)
Employment growth		-1.958 * (1.049)		-1.803 * (1.036)
Log income per capita (lagged one year)		-.037 ** (.017)		-.011 (.016)
Poverty rate (lagged one year)		.002 (.006)		.005 (.006)
Concealed weapons law		-.002 (.055)		-.034 (.054)
Population density		.034 (.057)		.117 ** (.011)
Welfare Population		-.001 (.012)		-.000 (.011)
R-Squared	.8157	.8315	.8146	.8327

NOTES. The dependent variable is the log of the juvenile violent arrest rate. The Work Requirement Stringency (WRS) Index is interacted with the poverty rate and population density. All regressions are estimated using weighted least squares and have been corrected for serial correlation (standard errors shown in parentheses). For both the poverty interaction and the density interaction, the first regression (1 and 3) is parsimonious, followed by the full controls model (2 and 4). The data include state and year observations for all states from 1990 to 2006 (717 observations with some missing variables). State and year fixed effects are included in all specifications. Variables are defined in the Data Appendix. Significance is indicated by *** for p-values less than .01, ** for p-values less than .05, and * for p-values less than .10.

TABLE V
ROBUSTNESS CHECKS FOR THE IMPACT OF WORK REQUIREMENT STRINGENCY ON
JUVENILE VIOLENT ARREST RATES

	POVERTY	DENSITY	WELFARE INTERACTION		WAIVER CONTROLS POVERTY		10-13 YEAR OLD POVERTY	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WRS Index	.435 *** (.152)	.192 * (.109)	.106 (.143)	.090 (.135)	.524 *** (.155)	.467 *** (.153)	.471 * (.249)	.398 (.245)
WRS-Poverty	-.032 ** (.014)				-.037 *** (.014)	-.033 ** (.014)	-.030 (.024)	-.027 (.024)
WRS-Density		-.057 *** (.016)						
WRS-Welfare			.002 (.048)	-.002 (.048)				
WRS-Waiver					.087 ** (.043)	.089 ** (.042)		
WRS Index II							-.040 (.294)	.004 (.278)
WRS-Poverty II							-.003 (.028)	-.004 (.027)
Effective abortion	.005 *** (.001)	.006 *** (.001)	.006 *** (.001)	.005 *** (.001)	.006 *** (.001)	.006 *** (.001)	.005 *** (.001)	.005 *** (.001)
Log prisoners per capita (lagged one year)	.138 (.113)	.017 (.115)	.074 (.113)	.120 (.115)	.091 (.111)	.134 (.113)	.071 (.114)	.115 (.116)
Log police per capita (lagged one year)	-.423 * (.252)	-.515 * (.264)	-.483 * (.273)	-.524 * (.268)	-.391 (.264)	-.436 * (.262)	-.344 (.245)	-.392 (.251)
Employment growth	-2.143 ** (1.018)	-2.085 ** (1.005)	-1.861 * (1.090)	-2.079 * (1.067)	-2.107 ** (1.052)	-2.316 ** (1.023)	-1.891 * (1.052)	-2.057 ** (1.022)
Log income per capita (lagged one year)	-.034 ** (.017)	-.011 (.016)	-.021 (.017)	-.021 (.017)	-.039 ** (.017)	-.037 ** (.017)	-.041 ** (.017)	-.039 ** (.017)
Poverty rate (lagged one year)	.000 (.006)	.003 (.006)	.003 (.006)	.001 (.006)	.002 (.006)	.000 (.006)	.001 (.006)	-.001 (.006)
Concealed weapons law	.000 (.058)	-.033 (.057)	-.020 (.054)	-.018 (.057)	.005 (.055)	.006 (.058)	.005 (.055)	.008 (.061)
Population density	.043 (.052)	.113 ** (.012)	.046 (.054)	.054 (.050)	.034 (.058)	.044 (.053)	.040 (.053)	.047 (.049)
Welfare Population	.001 (.012)	.003 (.012)	.003 (.011)	.005 (.012)	-.001 (.012)	.001 (.013)	-.001 (.012)	.002 (.013)
R-Squared	.8257	.8269	.8300	.8244	.8325	.8267	.8349	.8293

NOTES. The dependent variable is the log of the juvenile violent arrest rate. The Work Requirement Stringency (WRS) Index is interacted with the poverty rate, population density, the welfare population, and AFDC waiver dates. The WRS Index II is a measure of stringency for the younger cohort (10-13 years old). All regressions are estimated using weighted least squares and have been corrected for serial correlation (standard errors shown in parentheses). The first two (1 and 2) regressions are unweighted poverty and density interactions. Regressions 3 and 4 are weighted (WLS) and unweighted welfare population interactions, respectively. Regressions 5 and 6 are weighted (WLS) and unweighted waiver lag interactions, respectively. Regressions 7 and 8 are weighted (WLS) and unweighted younger cohort interactions, respectively. The data include state and year observations for all states from 1990 to 2006 (717 observations with some missing variables). State and year fixed effects are included in all specifications. Variables are defined in the Data Appendix. Significance is indicated by *** for p-values less than .01, ** for p-values less than .05, and * for p-values less than .10.

TABLE VI
REGRESSION RESULTS FOR THE IMPACT OF THE YEARS SINCE THE PRWOA REFORM ON
JUVENILE VIOLENT ARREST RATES

	(1)	(2)	(3)
Years since reform	.023 (.025)	.014 (.027)	.030 (.029)
Years since reform with poverty interaction	-.002 *** (.001)	-.002 ** (.001)	-.002 ** (.001)
Poverty rate (lagged one year)	.008 (.006)	.009 (.006)	.004 (.006)
WRS Index		.164 * (.091)	.152 * (.088)
Years Index		.018 (.020)	.016 (.019)
Effective abortion			.005 *** (.001)
Log prisoners per capita (lagged one year)			.115 (.115)
Log police per capita (lagged one year)			-.334 (.255)
Employment growth			-2.052 * (1.069)
Log income per capita (lagged one year)			-.042 ** (.018)
Concealed weapons law			-.002 (.054)
Population density			.040 (.054)
Welfare Population			-.004 (.018)
R-Squared	.8185	.8191	.8334

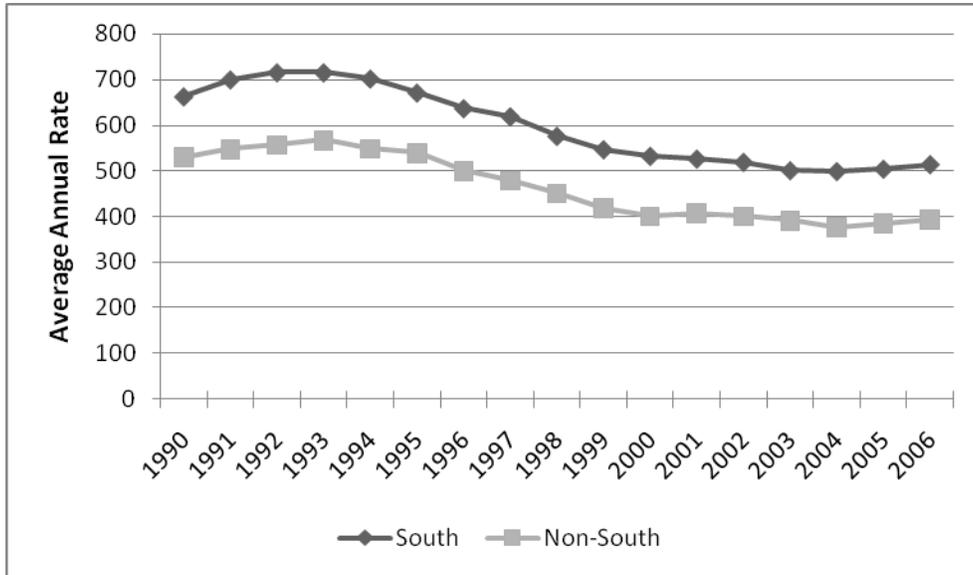
NOTES. The dependent variable is the log of the juvenile violent arrest rate. The variable, *years since (the PRWOA) reform*, is interacted with the poverty rate. All regressions are weighted least squares and have been corrected for serial correlation (standard errors shown in parentheses). Regression 1 is parsimonious, with the WRS and Years Indices added to Regression 2. Regression 3 is the full controls model. The data include state and year observations for all states from 1991 to 2006 (716 observations) with some missing variables. State and year fixed effects are included in all specifications. Variables are defined in the Data Appendix. Significance is indicated by *** for p-values less than .01, ** for p-values less than .05, and * for p-values less than .10.

TABLE VII
REGRESSION RESULTS FOR THE IMPACT OF WORK REQUIREMENT STRINGENCY ON
JUVENILE PROPERTY ARREST RATES

	POVERTY INTERACTION		DENSITY INTERACTION	
	(1)	(2)	(3)	(4)
WRS Index	.155 (.125)	.128 (.134)	.226 ** (.105)	.235 ** (.102)
WRS-Poverty	.005 (.010)	.005 (.012)		
WRS-Density			-.009 (.009)	-.037 *** (.009)
Effective abortion		.002 *** (.000)		.002 *** (.000)
Log prisoners per capita (lagged one year)		-.276 *** (.087)		-.330 *** (.090)
Log police per capita (lagged one year)		.005 (.112)		.021 (.117)
Employment growth		-1.029 (.723)		-.995 (.718)
Log income per capita (lagged one year)		-.007 (.012)		-.004 (.011)
Poverty rate (lagged one year)		.004 (.004)		.005 (.004)
Concealed weapons law		.061 (.048)		.055 (.047)
Population density		.023 (.020)		.060 ** (.026)
Welfare Population		-.008 (.009)		-.011 (.009)
R-Squared	.8438	.8511	.8439	.8524

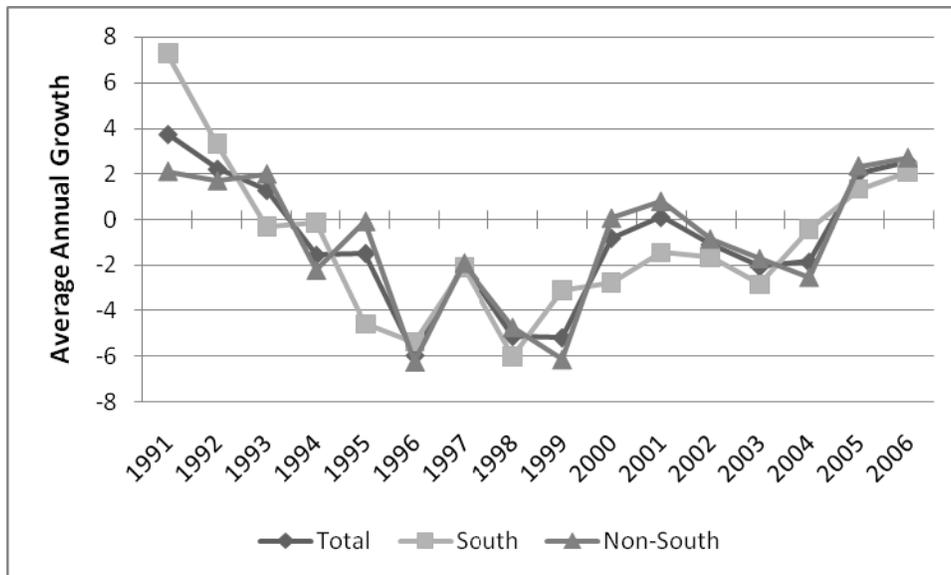
NOTES. The dependent variable is the log of the juvenile property arrest rate. The Work Requirement Stringency (WRS) Index is interacted with the poverty rate and population density. All regressions are estimated using weighted least squares and have been corrected for serial correlation (standard errors shown in parentheses). For both the poverty interaction and the density interaction, the first regression (1 and 3) is parsimonious, followed by the full controls model (2 and 4). The data include state and year observations for all states from 1990 to 2006 (717 observations with some missing variables). State and year fixed effects are included in all specifications. Variables are defined in the Data Appendix. Significance is indicated by *** for p-values less than .01, ** for p-values less than .05, and * for p-values less than .10.

FIGURE I
AVERAGE ANNUAL VIOLENT CRIME RATE
 1990-2006



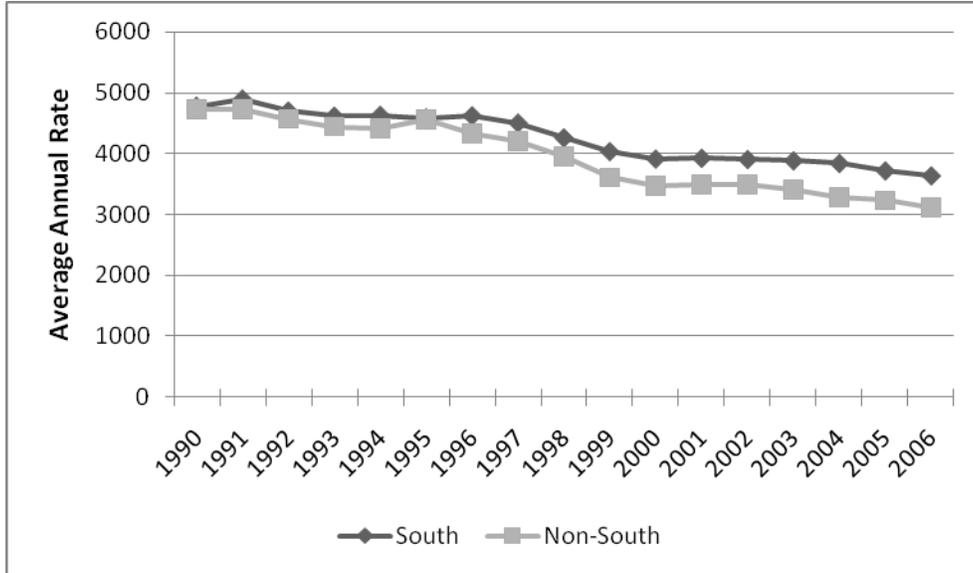
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE II
AVERAGE ANNUAL GROWTH IN THE VIOLENT CRIME RATE
 1991-2006



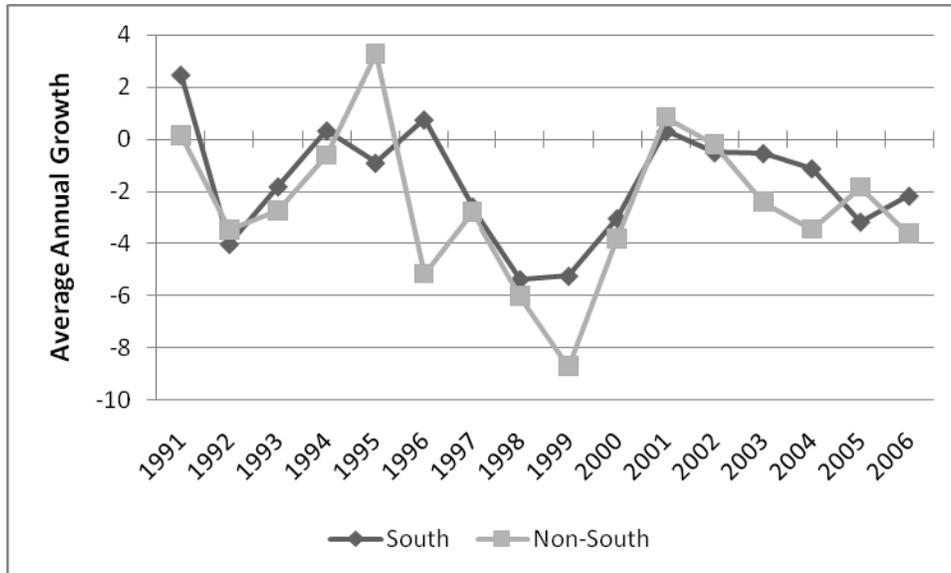
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE III
AVERAGE ANNUAL PROPERTY CRIME RATE
 1990-2006



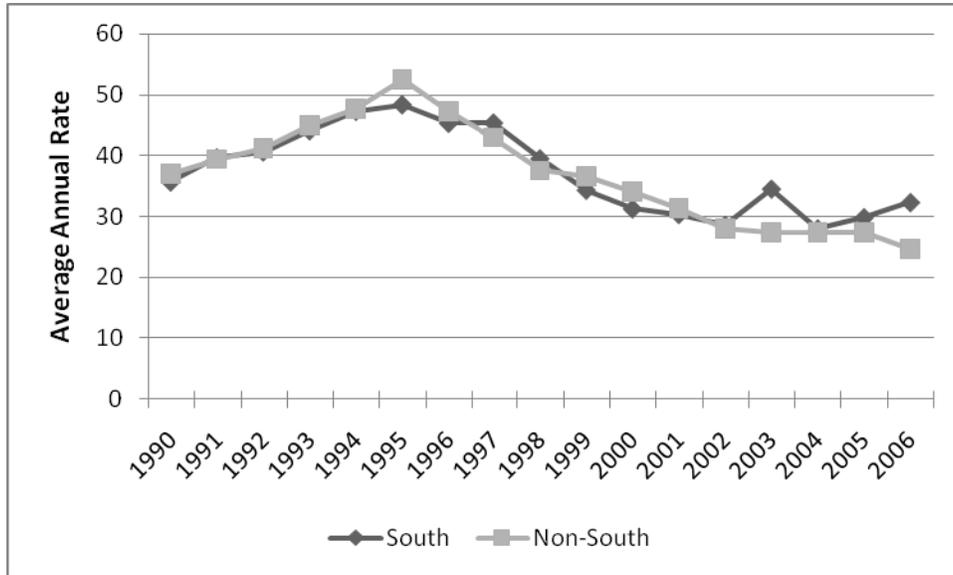
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE IV
AVERAGE ANNUAL GROWTH IN THE PROPERTY CRIME RATE
 1991-2006



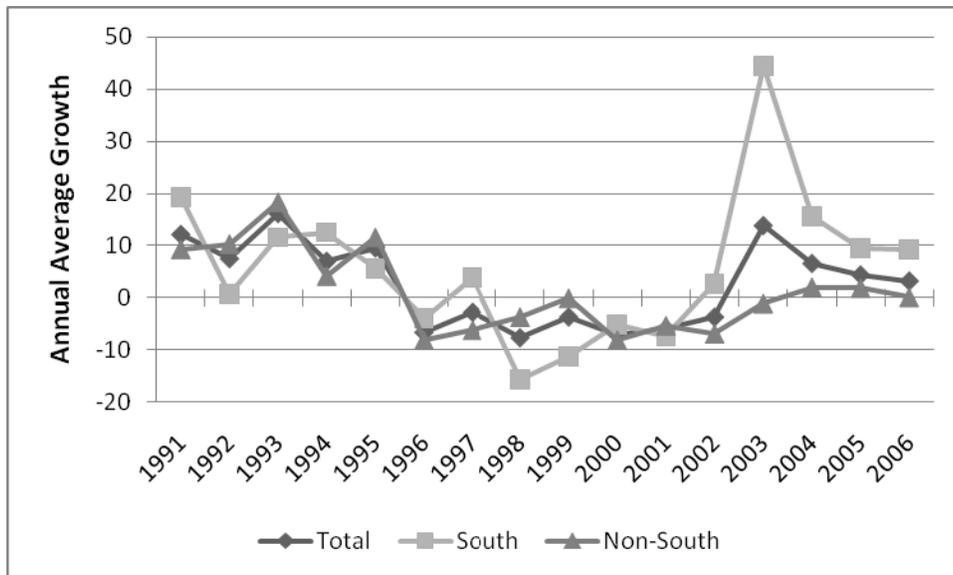
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE V
AVERAGE ANNUAL JUVENILE VIOLENT ARREST RATE
 1990-2006



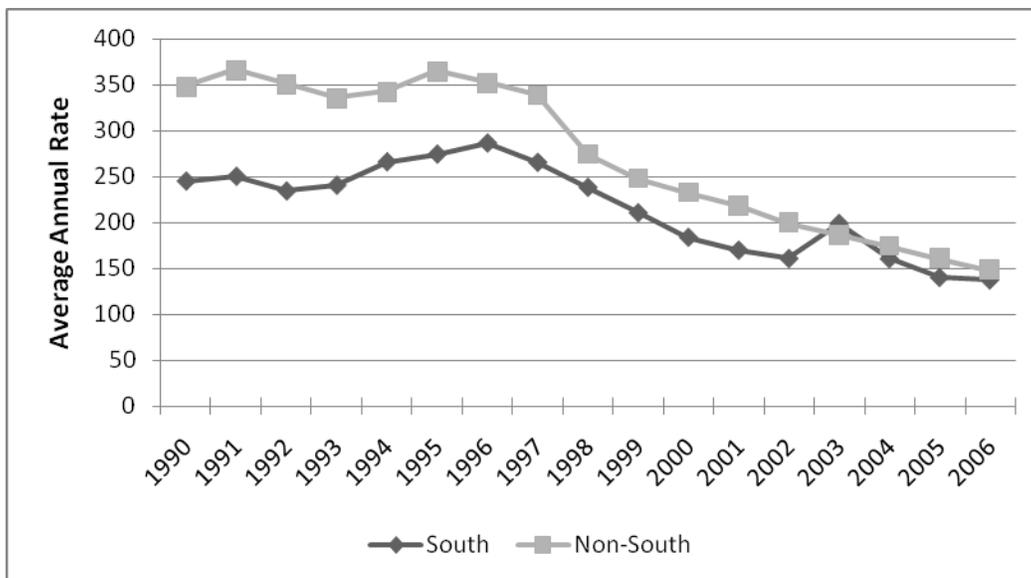
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE VI
AVERAGE ANNUAL GROWTH IN THE JUVENILE VIOLENT ARREST RATE
 1991-2006



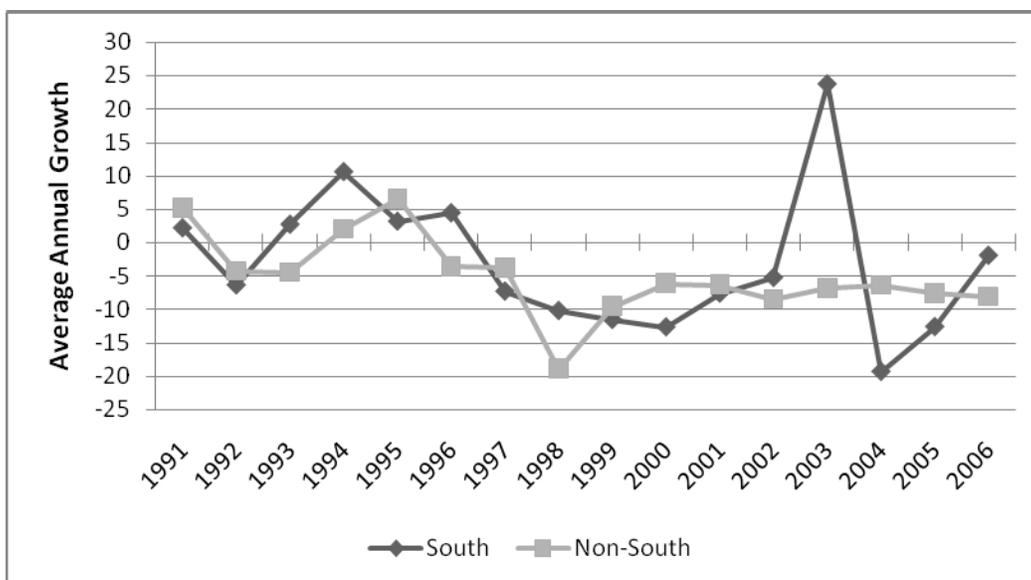
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Maximum is for the 44% growth in the juvenile violent arrest rate in the South in 2003.

FIGURE VII
AVERAGE ANNUAL JUVENILE PROPERTY ARREST RATE
 1990-2006



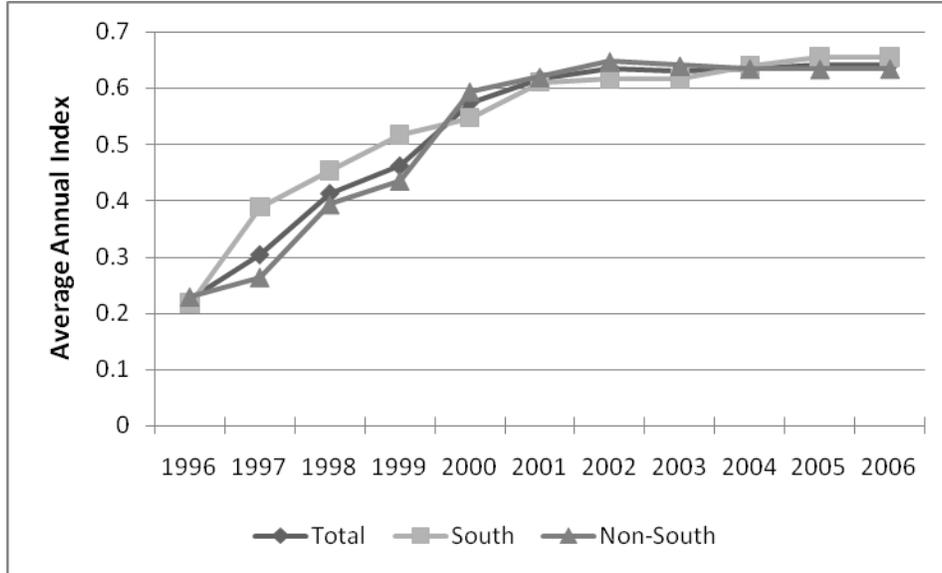
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE VIII
AVERAGE ANNUAL GROWTH IN THE JUVENILE PROPERTY ARREST RATE
 1991-2006



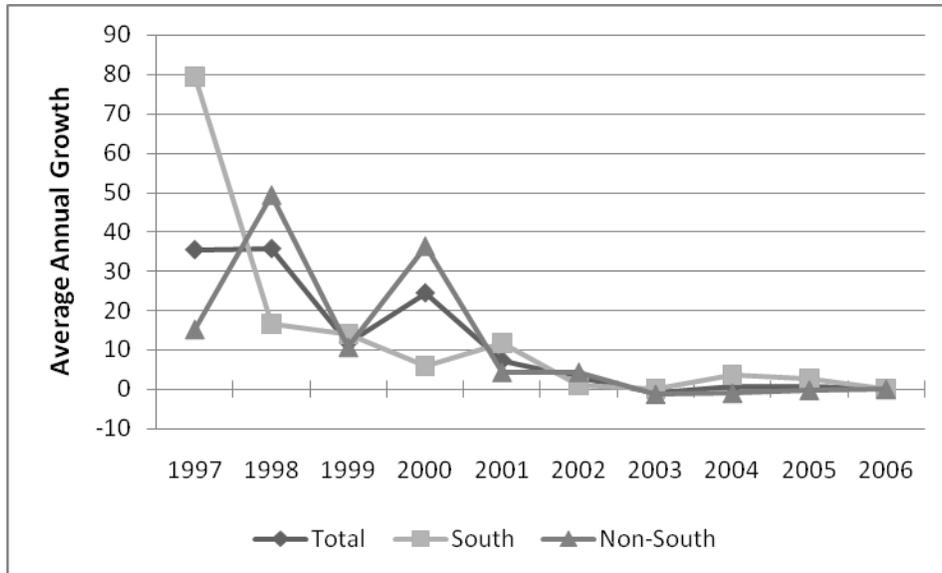
NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Maximum is for the 24% growth in the juvenile property arrest rate in the South in 2003.

FIGURE IX
AVERAGE ANNUAL WORK REQUIREMENT STRINGENCY (WRS) INDEX
 1996-2006



NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

FIGURE X
AVERAGE ANNUAL GROWTH IN THE WORK REQUIREMENT STRINGENCY (WRS) INDEX
 1997-2006



NOTES. South includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Maximum is the 80% growth in the WRS Index in 1997 in the South.