

**CHANGES IN COMMUNITY CHARACTERISTICS AND JUVENILE VIOLENCE
DURING THE 1990s: AN EXAMINATION OF LARGE COUNTIES**

A Report from the “Understanding the ‘Whys’ Behind Juvenile Crime Trends” Project

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INTRODUCTION

This paper reports research that was conducted as part of the University of Pennsylvania's project on "Understanding the 'Whys' Behind Juvenile Crime Trends." The "Whys" project, which was funded by the Office of Juvenile Justice and Delinquency Prevention of the U.S. Department of Justice, was conducted to develop a better understanding of the downturn in juvenile crime that occurred in the 1990s and to use this knowledge to help practitioners and policymakers understand potential leading indicators of turning points in local juvenile crime trends. The main volume of the Whys report (which is available online at <https://www.ncjrs.gov/pdffiles1/ojjdp/grants/248954.pdf> and at www.whysproject.org) discusses juvenile violence trends from the 1980s through the early 2000s and assesses evidence on a wide variety of community, developmental, cultural, and policy factors that have been hypothesized as possible causes of juvenile crime trends during this period. (Primary contributors to the main Whys report include Jeffrey Roth (project director), Reagan Daly, Christopher Koper, James Lynch, Howard Snyder, Monica Robbers, and other staff of CSR Incorporated.)

The study reported in this paper was conducted to complement Chapter 3 of the Whys report, which assesses national trends and prior research linking community characteristics to juvenile violence. (Readers interested in this background material, which is not reviewed here, should consult Chapter 3 of the Whys report.) To extend that work, this paper presents an original analysis of changes in selected community characteristics and juvenile violence in a sample of urban and suburban counties during the 1990s. More specifically, we examine whether indicators of demographics, poverty, family composition, economics, drug markets, and community capacity in these jurisdictions changed in ways consistent with the 1990's drop in juvenile violence. Furthermore, we assess whether these relationships were stable during different portions of the decade by examining whether demographic and socioeconomic changes that were occurring in these communities between 1990 and 2000 were associated with changes in juvenile violence that occurred from 1994 to 1998 and from 1994 to 2000. We explain the reasons for this in more detail below.

Our study extends and complements prior research in a number of ways. First, as discussed in Chapter 3 of the Whys report, there has been little research assessing whether the crime drop of the 1990s was linked to improvements in community characteristics during this period. Moreover, most research on communities and crime during the 1990s has focused on the early part of the decade when crime was increasing rather than the later part of the decade when crime was falling. Our study, in contrast, highlights the latter period.

Second, much of the research examining community characteristics and juvenile crime has focused on large cities or neighborhoods therein. Yet family disruption and other indicators of social disorganization have also been linked to youth violence in non-urban contexts (Osgood and Chambers, 2000). As shown in Chapter 2 of the Whys report, moreover, juvenile violence did not drop just in cities during the 1990s; it declined in suburban and rural communities as well. Studying counties with a mix of urban and suburban areas thus provides insights into both the saliency of community-level risk factors outside the urban context and the extent to which they affected trends in juvenile violence across urban and suburban areas during the 1990s. At

the same time, however, we chose to focus on large jurisdictions that have more influence on national crime trends.

In sum, we find that reductions in adult violence, unemployment, concentrated poverty, and juvenile drug offending accelerated reductions in juvenile violence between 1994 and 2001, as did increases in owner-occupied housing, divorce, and the Hispanic population. The effects of these factors on juvenile crime trends also seem to have varied during different portions of the 1990s. However, their effects were modest and do not explain much of the downward trend in juvenile violence during this period. This suggests that the decline in juvenile violence was largely driven by a secular trend—perhaps representing a host of social, cultural, and/or policy factors—operating independently of the changes in the community characteristics examined in this study. At the same time, our conclusions must be tempered by several important limitations to the data and analysis.

DATA AND METHODS

The Study Sample

This analysis examines changes in juvenile violence from 1994 through 2001 in a sample of 129 U.S. counties that had a population of 250,000 or more as of 1994 and that had high levels of crime reporting to the Uniform Crime Reports (UCR) from 1994 through 1998 (see below).^{1, 2} (These years were highlighted in the first stage of our analysis, which is described below.) The counties in our sample accounted for 39% of the nation's population in both 1990 and 2000. Moreover, they accounted for 43% of the national decrease in arrests of juveniles for violence between 1994 and 1998.³ However, while these counties arguably represent an important segment of large jurisdictions, they were not chosen at random. Hence, caution should be used in extrapolating the results to other counties nationwide. An additional caveat is that our analysis does not include earlier years of the 1990s (1990 through 1993) for reasons noted below. (A list of the counties included in the analysis is presented in Table 6.)

¹ The county files were compiled and provided to us by the National Center for Juvenile Justice at the University of Pittsburgh using data available through the National Archive of Criminal Justice Data of the Inter-Consortium for Political and Social Science Research at the University of Michigan (<http://www.icpsr.umich.edu/NACJD/>).

² Five additional counties fit our inclusion criteria but were removed from the sample because the quality of their juvenile violent crime arrest data appeared questionable. This was done through a two-step process. First, any county in which the number of juvenile violent arrests reported for any one year between 1994 and 2001 was more than four times or less than one-fourth the mean of the remaining four years was considered an outlier. Three counties were removed under this criterion: Denver County, CO; Ramsey County, MN; and Allen County, IN. In the next step, we examined juvenile violent crime arrest data for the remaining counties in CO, MN, and IN to determine if data collection was a problem at the state level. For these counties, if the number of juvenile violent arrests for any one year between 1993 and 1998 was more than twice or less than half the mean for the remaining four years, this was considered evidence of potential problems in state-level reporting. Under this criterion, we eliminated the remaining CO counties—Jefferson County and Boulder County. The remaining MN and IN counties were left in the sample.

³ This percentage was calculated by summing the number of violent crime arrests in the counties for 1994 and for 1998, subtracting the 1998 value from the 1994 value, and dividing the difference by the national difference between the two years. Note that these counties also accounted for 19.4% of the decline in arrests of adults for violence during this period.

Data and Measures

Juvenile Violence

Our measure of juvenile violence is based on county-level estimates of arrests of juveniles for serious violence (i.e., murder, rape, robbery, and aggravated assault) as calculated by the Inter-Consortium for Political and Social Science Research (ICPSR) at the University of Michigan (see the Uniform Crime Reporting Program of ICPSR's National Archive of Criminal Justice Data). These estimates are based on police agency reports to the UCR, which have been aggregated to the county-level and adjusted for incomplete reporting. For this analysis, we used only counties that had UCR coverage levels of 80% or more from 1994 through 1998 as determined by ICPSR based on the number of agencies reporting data, the number of months for which they reported, and the percentage of the population they served. Further, the counties selected for the analysis were participants in the National Juvenile Data Court Archive sponsored by OJJDP and were judged by staff of the National Center for Juvenile Justice (who maintain the archive) to have accurate and complete juvenile crime data. Overall, the selected counties accounted for over 60% of all counties in the United States with a population of 250,000 or more in 1998. The selected counties also tended to be the larger jurisdictions among this group; their populations were 13% larger on average, and they contained about two-thirds of all people living in counties within this population group.

Although county-level crime data are available from ICPSR dating back to the mid-1980s, the data from 1994 onward are not comparable with those of earlier years due to changes in the estimation procedures for missing data (see http://www.icpsr.umich.edu/NACJD/ucr.html#desc_cl). For this reason, our study is based on trends in juvenile violence from 1994 onward. As shown in Chapter 2 of the Whys report, the national decline in juvenile violence began at approximately this time.

Using the county-level estimates from ICPSR, we calculated the annual juvenile arrest rate for serious violence per 100,000 juveniles aged 10 to 17 for the years 1994 through 2001. As described below, we then analyzed changes in the juvenile arrest rate for violence over different portions of this period.

Arrest data provide the only source available for studying aggregate trends in juvenile violence across units such as counties and cities. However, they have a number of limitations as measures of juvenile violence. To begin with, their validity and reliability can be affected by reporting practices (among both citizens and police), the success of police in solving reported offenses, and discretionary decisions by police in the handling of juvenile offenders. In other words, they measure citizen and police reactions to juvenile violence as well as juvenile violence itself.⁴ Another limitation is that arrest data provide counts of offenders rather than incidents.

⁴ UCR figures published by the Federal Bureau of Investigation (see <http://www.fbi.gov/ucr/ucr.htm#cius>) show that overall clearance rates for violent crime (including crimes by both adults and juveniles) increased from 45% in 1995 to 50% in 1999, before falling somewhat to under 48% in 2000 (and lower in subsequent years). This suggests that police were becoming somewhat more successful at apprehending violent offenders during the late 1990s. As a

Nonetheless, arrest data should provide a reasonable basis for studying trends over time in juvenile violence across jurisdictions. As shown in the Whys report (Chapter 2), trends in juvenile violence as estimated by arrest data were quite consistent during the 1990s with those estimated from the National Crime Victimization Survey. Furthermore, previous research has shown that there is much consistency in both the individual-level and community-level correlates of juvenile crime, particularly that of a more serious nature, across official data (both arrests and citizen calls for service), victimization surveys, and self-reports by offenders (e.g., see Hindelang, 1978; Hindelang et al., 1979; Osgood and Chambers, 2000: 91). Accordingly, we can expect our analysis of juvenile arrest data to provide reasonable estimates of the correlates of juvenile offending at the community level.

Our focus on serious violence should also minimize biases stemming from differential reporting and discretionary handling of delinquents by police across jurisdictions. Further, as discussed below, our analysis is based on fixed effects models which control for unmeasured differences between units that are stable over time. Consequently, unmeasured differences between counties in the reporting and handling of juvenile violence are controlled in our analysis, provided that these differences remained constant during the study period.

Community Characteristics

To predict changes in juvenile violence among the selected counties, we employed several measures related to demographics, poverty, family composition, legitimate and illegitimate economic opportunities, and community capacity (see Chapter 3 of the Whys report for further discussion of these issues). We drew heavily on the work of others—most notably, Land, McCall, and Cohen (1990), Sampson, Raudenbush, and Earls (1997), and Miethe, Hughes, and McDowall (1991)—in creating these measures, most of which were taken from the 1990 and 2000 U.S. Census surveys. Unless noted otherwise, each variable was expressed as a change score representing its change from 1990 to 2000. Our measures of community characteristics can be grouped as follows.

- We measured changes in population and the relative size of the crime-prone demographic cohort based on, respectively, the percentage change in the total population size and change in the percentage of the population represented by males ages 12-17
- Changes in poverty and poor families were measured based on changes in median family income, the percentage of families with related children under 18 living below the poverty line, the percentage of the total population living under the poverty line, and poverty concentration. Poverty concentration was computed by dividing the number of poor individuals in each county living in high-poverty census tracts (i.e., tracts in which

caveat, therefore, our juvenile arrest measures may understate decreases in juvenile violence and overstate increases in juvenile violence. Nevertheless, as noted below and in the Whys report, national trends in juvenile violence were largely consistent during the 1990s as measured by arrest data and victimization survey data.

at least 30% of the residents were living below the poverty line) by the total number of poor individuals in the county (see Jargowsky, 2003; Stretesky et al., 2004).⁵

- Changes in family disruption were assessed based on changes in both the percentage of children living with married parents and the percentage of the population 15 years and older that was divorced.
- Changes in residential stability were measured based on changes in both the percentage of individuals five years of age and older who had resided in the same house five years earlier and the percentage of housing that was owner-occupied.
- Changes in immigration and the racial and ethnic mix of the population were measured using changes in the percentage of the population that was foreign-born, changes in the percentage of the population (of any race) that was of Latino/Spanish/Hispanic origin, and changes in racial heterogeneity. Racial heterogeneity was calculated by multiplying the proportions of the population represented by the following racial groups: white, black, American Indian/Eskimo, Asian/Pacific Islander, other race (including mixed race), and Hispanic (the final product of these proportions was multiplied by 1,000 to increase the scale).⁶
- Changes in legitimate economic opportunities were captured by changes in the civilian unemployment rate for persons 16 years and older.
- Changes in illegitimate economic opportunities were measured based on changes in the juvenile arrest rate for drug offenses. This indicator is based on annual county-level estimates developed by ICPSR from UCR data for the years 1994 through 2001 and includes arrests for sales and possession of all types of drugs.⁷

Besides the community characteristics listed above, we also incorporated a number of additional variables to control for unmeasured factors that may have influenced trends in juvenile violence. In all models, we included the percentage of the population under 18 that was African-American in 1990. As discussed in Chapter 2 of the Whys report, the national decrease in

⁵ Although Jargowsky and Bane (1991) argue that 40% is the best cutoff for identifying high poverty census tracts, they also acknowledge that cutoff points are arbitrary, and a 30% standard provides more variation in poverty concentration among counties in this sample. The 30% standard has been used in previous research as well (Stretesky et al 2004).

⁶ Researchers have used a number of racial/ethnic heterogeneity measures. Ours is based on that used by Miethe et al. (1991). Although Hispanic background is considered an ethnicity rather than a race, it was included in this measure because it represents a significant minority group and thus is likely to have a significant impact on an area's racial/ethnic character.

⁷ Although drug arrests partially reflect variation in drug enforcement practices between places and over time, arrests for some drugs, particularly harder drugs such as cocaine and heroin, are highly correlated with other independent indicators of drug use (such as drug-related emergency room admissions) and therefore appear to be a reasonable gauge of drug use and sales in a jurisdiction (Rosenfeld and Decker, 1999; also see Cork, 1999; Ousey and Augustine, 2001; and Ousey and Lee, 2002). See Chapter 3 of the Whys report for further discussion of studies linking drug arrests to youth violence.

juvenile violence that occurred during the 1990's was more concentrated among black youth. Thus, we anticipated that decreases in juvenile violence during the study period were more likely to occur and to be larger in counties with a larger percentage of black juveniles. We interpret this measure as a proxy for normative or cultural changes that may have occurred in the black community during this period (e.g., see Curtis, 1998 and Chapter 4 of the Whys report).

Two additional control measures were included in some but not all models. One is the change in the rate of violent crime arrests for adults from 1994 through 2001. We hypothesized that adult offending could be related to juvenile offending in one or a number of ways. First, adult violence might affect juvenile violence through its effects on social control within a community (e.g., higher levels of adult violence might decrease social control within a community, thereby increasing juvenile violence). Second, adult violence has direct links to juvenile violence through co-offending. As noted in Chapter 2 of the Whys report, one-third of juvenile violence involves co-offending with adults. Third, trends in adult arrests may serve as a proxy for unmeasured factors that reduced both adult and juvenile violence during the 1990s. One such factor could have been changes in criminal and/or juvenile justice practices, which are not measured explicitly in our study. (See Chapter 5 of the Whys report for a discussion of policy changes that may have reduced juvenile violence during the 1990s.) However, while our use of the adult arrest rate for violence provides controls for the aforementioned possibilities, it does not enable us to determine which of them were most salient to trends in juvenile violence. Additionally, controlling for the adult crime rate provides insight into forces that had differential effects on juvenile and adult violence during the 1990s.

Finally, in some models, we also included the average juvenile arrest rate for 1994 and 1995 to control for regression to the mean, i.e., the possibility that the juvenile violent crime drop was due mainly to cyclical factors operating independently of the other factors measured in our models. To the extent that this occurred, juvenile violence would have dropped most in places that had the highest rates of juvenile violence at the beginning of the study period.

Methods

General Approach and Limitations

Using bivariate and multivariate techniques, we examined the association between changes in community characteristics and juvenile violence during two periods. At an earlier stage of the project, we examined changes in juvenile violence from 1994 through 1998 (at the time, 1998 was the most recent year for which data were available). At a later stage, we updated the data through 2001, which enabled us to assess changes from 1994 through 2001, a period that included virtually all of the national drop in juvenile violence that had occurred as of 2004 (see Chapter 2 of the Whys report).

Comparing the two sets of models allows us to examine changes in the predictive value of explanatory factors from the early years of the crime drop to the later years. As of 1998, about 20% of the counties in our sample still had steady or increasing rates of juvenile violence. By 2001, in contrast, all but 6% had experienced a drop in juvenile violence from 1994 levels. Comparing models based on these two time periods may thus provide insights into differential

influences on juvenile violence in counties where it dropped early versus those where it dropped late. Below, we refer to models employing the 1994-1998 data as the *early-change* models and to those using the 1994-2001 data as the *late-change* models.

As discussed above, most of our explanatory variables were measured in terms of change between 1990 and 2000.⁸ This incongruity between the timing of our explanatory and outcomes variables is an important limitation to the analysis. This would be less of a concern if the explanatory variables changed in a relatively linear fashion over time. However, this is likely not the case for many of these indicators. At the national level, for example, unemployment rose from 5.6% in 1990 to 7.5% in 1992 before dropping back to 5.6% by 1995 and then falling to 4% by 2000 (see Chapter 3 of the Whys report). Similar patterns in poor female-headed families with children were also discussed in the Whys report (Chapter 3). Consequently, the changes that occurred in our explanatory variables from 1990 to 2000 may not provide a good indication of the rate, or perhaps even the direction, of change that was actually occurring in these factors between 1994 and 2000. On balance, however, we expect that places that had greater decreases in a given characteristic between 1990 and 2000 also had greater decreases in that characteristic between 1994 and 2000 (and *visa versa* for increases).

Due to this problem, the analysis should be viewed as an exploratory examination of changes in community characteristics and their effects on juvenile violence. In our interpretations, we place more emphasis on factors that had statistically significant associations with juvenile violence despite this measurement problem (measurement error tends to attenuate relationships between variables, thus making it more difficult to find statistically significant associations). Statistically non-significant findings should perhaps be viewed with particular caution and not necessarily interpreted as falsifications of hypothesized relationships between juvenile violence and the community characteristics in question.

Modeling Methods

After conducting descriptive and bivariate analyses (to be presented below), we estimated a series of multivariate change score models that regressed changes in the juvenile violent crime arrest rate on changes in our explanatory variables. Two common problems with change score models are that: 1) change in a given variable, Y, is often negatively correlated with Y's value at time 1 (due to regression to the mean), which can create spurious associations between the change score and other variables related to Y's time 1 value; and 2) change scores tend to magnify unreliability in the measurement of Y at time 1 and time 2, thus attenuating regression coefficients (Allison, 1990; Gillespie and Streeter, 1994; Johnston and DiNardo, 1997: 399-401).

We attempted to lessen these problems in a number of ways. First, to reduce the effects of random year to year variability and dampen measurement error in the change scores, we created the change scores based on changes in the average of the juvenile violent crime arrest rate between three pairs of years: 1994-1995, 1997-1998, and 2000-2001. Using these averages, we created separate change scores for the period of 1994-95 to 1997-98 and the period of 1994-

⁸ County-level estimates of most community characteristics examined in this study are not available for years between 1990 and 2000. Although unemployment can be measured annually at the county level, we chose to use its change from 1990 to 2000 to maintain consistency with the measurement of the other key theoretical predictors.

95 to 2000-01. This strategy reduces measurement error by using a two-year average of juvenile violence for each data point and by using differences calculated over multiple years rather than annually. Regarding the latter point, Johnston and DiNardo (1997: 401) note that attenuation bias in regression coefficients should be less when change scores are calculated over longer periods. Our early change models examine changes over three years while our late change models examine changes over six years. Note that we calculated changes in juvenile drug arrests and changes in adult arrests for violence in the same manner.

Second, as discussed above, we included the average juvenile violent crime arrest rate for the years of 1994 and 1995 as a covariate in a number of our models. This represents the value of our outcome measure at time 1. When analyzing change scores as represented by $Y_{\text{time } 2} - Y_{\text{time } 1}$, including the value of $Y_{\text{time } 1}$ as a covariate in the regression model controls for the relationship between the change score and $Y_{\text{time } 1}$, thereby adjusting the coefficients of the other covariates for the potentially confounding influence of $Y_{\text{time } 1}$ (Gillespie and Streeter, 1994).

In its full form, our model can be expressed as:

$$Y_{\text{time } 2} - Y_{\text{time } 1} = \alpha + \beta(X_{\text{time } 2} - X_{\text{time } 1}) + \lambda Y_{\text{time } 1} + \phi Z + \varepsilon$$

where $Y_{\text{time } 2} - Y_{\text{time } 1}$ represents the change in juvenile violence from 1994/95 to 1997/98 in the early change model and from 1994/95 to 2000/01 in the late change model; $\beta(X_{\text{time } 2} - X_{\text{time } 1})$ represents the effects of changes in selected community characteristics as described above (measured as changes from 1990 to 2000 or for the same period as the outcome variable); $\lambda Y_{\text{time } 1}$ corresponds to the average juvenile violent crime arrest rate in 1994 and 1995 (this term was not included in all models); ϕZ represents the percentage of the youth population that was black in 1990; α is an intercept term; and ε is an error term with standard properties.

Based on preliminary results suggesting that the residual variance was heteroskedastic with respect to the size of the juvenile population (residual variance decreased as the size of the juvenile population increased), we estimated our models using weighted least squares (WLS), with weights based on each county's juvenile population in 1996. As an added measure, we estimated the models with standard errors robust to heteroskedasticity.⁹

In preliminary modeling, we added quadratic terms for some of the explanatory variables, based on bivariate plots suggesting that some the explanatory variables had non-linear relationships with juvenile violence. We kept quadratic terms in the model if both they and their corresponding main effect terms were significant in the exploratory models.¹⁰

⁹ Models were estimated using the PROC GENMOD procedure in SAS software.

¹⁰ To reduce collinearity between the quadratic terms and their associated main effect terms, we created the former using centered values of the original variables. (Centered values were calculated by subtracting each variable's sample mean from its value for each observation.) However, if the inclusion of a quadratic term reduced the main effect to non-significance, the quadratic term was left out of the final model.

Finally, we also examined diagnostics for multicollinearity and outliers. Although community characteristics of the sort examined in this study are often highly correlated, multicollinearity was not a problem in this analysis due to our use of change scores rather than variables expressed in levels.¹¹ However, preliminary modeling revealed that some results were sensitive to the inclusion of a small number of outlying observations. In order to strengthen our ability to generalize from the results, we therefore removed outlier cases that produced studentized residuals with an absolute value greater than 2.5.¹²

ANALYSIS AND RESULTS

Descriptive Statistics and Bivariate Correlations

We begin by examining the changes that occurred in juvenile violence and community characteristics in our sample of counties. Table 1 presents the raw and relative (i.e., percentage) changes in the average of each variable between 1990 and 2000, or in the case of arrest rate variables, changes between the 1994-1995 average and both the 1997-1998 and 2000-2001 averages.

On average, the juvenile arrest rate for violence declined 18% in these counties from the mid-1990s to the late 1990s (i.e., 1994-1995 to 1997-1998) and 38% from the mid-1990s to the early 2000s (i.e., 1994-1995 to 2000-2001). Adult violence also declined during these periods but by smaller magnitudes—approximately 5% and 17%, respectively.

Turning to other community characteristics, there were statistically significant reductions in concentrated poverty, families with children in poverty, and children living with married parents. These reductions ranged from 3% for families with children in poverty to 11% for concentrated poverty. At the same time, these counties experienced statistically significant increases in population, median family income,¹³ family disruption (i.e., divorce), residential stability, owner-occupied housing, immigration, Hispanic residents, racial heterogeneity, and the relative size of the juvenile population. In relative terms, these increases ranged from about 3% for owner-occupied housing and residential stability to 169% for racial heterogeneity. Factors that did not change significantly during the study period included the unemployment rate and the share of the population living in poverty. Also, while juvenile drug arrests rose significantly from the mid to late 1990s, they declined afterwards, resulting in a moderately significant ($p < .10$) net drop from the mid-1990s to the early 2000s. While some of the changes in community characteristics were consistent with the drop in juvenile violence (e.g., the reduction in concentrated poverty), others were not (e.g., the reduction in children living with married parents). (See Chapter 3 of the *Whys* report for a discussion of the expected relationships between our community indicators and juvenile violence.)

¹¹ Tolerance scores below .1 were considered evidence for multicollinearity.

¹² The number of cases removed ranged from 3 to 6 across the various models presented below.

¹³ The rise in median family income also reflects the impact of inflation, though this is treated as a constant across all counties.

Bivariate correlations between changes in juvenile violence and changes in the explanatory variables are shown in Table 2.¹⁴ For the most part, the significant correlates of juvenile violence were the same for the early change and late change periods. The declines in adult violence and concentrated poverty were both significantly associated with the reduction in juvenile violence, as was the decline in juvenile drug arrests for the late change period. As expected, juvenile violence also dropped more substantially in places with a higher proportion of juveniles who were black in 1990. However, interpreting these associations in reference to the community changes shown in Table 1 suggests that several of these factors operated *counter* to the overall drop in juvenile violence. Specifically, increases in population, median family income, the relative size of the juvenile population, residential stability, and owner-occupied housing had statistically significant positive associations with changes in juvenile violence, meaning that they were associated with increases, or at least slower rates of decline, in juvenile violence. Similarly, the decline in children living with married parents had a significant inverse relationship with juvenile violence, suggesting that this too operated counter to the general downward trend in juvenile violence. However, most of these correlations were small to modest, with absolute values in the 0.1 to 0.3 range. Finally, changes in poverty (both overall poverty and poor families), divorce, unemployment, immigration, the Hispanic population, and racial heterogeneity did not have significant bivariate associations with trends in juvenile violence.

¹⁴ In our bivariate and multivariate analyses, changes in population, median family income, and racial heterogeneity were converted to percentage changes to standardize their scales. For racial heterogeneity, the average percentage change (1,955%) was much higher than the percentage difference between the time 1 and time 2 sample means shown in Table 1. When expressed in relative terms, most places had changes in racial heterogeneity exceeding 100%, and many had changes exceeding 1,000%.

**Table 1:
Changes in Juvenile Violence and Community Characteristics**

| <i>Measure</i> | <i>Time 1 mean</i> | <i>Time 2 mean</i> | <i>Raw Change</i> | <i>% Change</i> |
|--|--------------------|--------------------|-------------------|-----------------|
| Juvenile violent crime rate, 1994/95-1997/98 | 604.67 | 494.37 | -110.3** | -18.24 |
| Juvenile violent crime rate, 1994/95-2000/01 | 604.67 | 372.77 | -231.9** | -38.35 |
| Adult violent crime rate, 1994/95-1997/98 | 338.74 | 322.13 | -16.61** | -4.90 |
| Adult violent crime rate, 1994/95-2000/01 | 338.74 | 281.18 | -57.56** | -16.99 |
| Total population, 1990-2000 | 731850.91 | 826576.13 | 94725.22** | 12.94 |
| Percentage of families with related children under 18 living below the poverty line, 1990-2000 | 13.22 | 12.86 | -0.36* | -2.72 |
| Median family income, 1990-2000 | 40171.73 | 56158.28 | 15986.55** | 39.80 |
| Percentage of children under 18 living with married parents, 1990-2000 | 69.66 | 65.73 | -3.93** | -5.64 |
| Percentage of population divorced, 1990-2000 | 8.54 | 9.48 | 0.94** | 11.01 |
| Percentage of population unemployed, 1990-2000 | 6.13 | 5.99 | -0.14 | -2.28 |
| Percentage of population males age 12-17, 1990-2000 | 4.02 | 4.36 | 0.34** | 8.46 |
| Percentage of population living in same house 5 years ago, 1990-2000 | 52.01 | 53.61 | 1.6** | 3.08 |
| Percentage of owner-occupied housing, 1990-2000 | 61.74 | 63.42 | 1.68** | 2.72 |
| Percentage of population in poverty, 1990-2000 | 11.55 | 11.72 | 0.17 | 1.47 |
| Percentage of population foreign-born, 1990-2000 | 9.63 | 13.3 | 3.67** | 38.11 |
| Percentage of population of Hispanic/Latino/Spanish background, 1990-2000 | 10.97 | 14.72 | 3.75** | 34.18 |
| Racial heterogeneity, 1990-2000 | 0.000178442 | 0.000480274 | 0.00030183** | 169.15 |
| Juvenile drug arrest rate, 1994/95-1997/98 | 737.15 | 812.46 | 75.31** | 10.22 |
| Juvenile drug arrest rate, 1994/95-2000/01 | 737.15 | 698.97 | -38.18† | -5.18 |
| Concentrated poverty, 1990-2000 | 23.34 | 20.79 | -2.55** | -10.93 |
| Blacks under 18 as proportion of all under 18, 1990 | 16.04 | N/A | N/A | N/A |

n=129

** p<.01; * p<.05; † p<.10

**Table 2:
Bivariate Correlations Between Changes in Juvenile Violence and Changes in Community Characteristics**

| Explanatory Variable | 1994/95-1997/98 Change | 1994/95-2000/01 Change |
|---|------------------------|------------------------|
| Change in adult violent crime | .554** | .5692** |
| Percent change in total population 1990-2000 | .234** | .1956* |
| Change in percentage of families with related children under 18 living below the poverty line | .095 | .090 |
| Percent change in median family income | .291** | .308** |
| Change in percentage of children under 18 living with married parents | -.174* | -.179* |
| Change in percentage of the divorced population | -.024 | .005 |
| Change in percentage of the unemployed population | .074 | .012 |
| Change in percentage of the population that is males 12-17 | .150† | .196* |
| Change in percentage of individuals 5 years and older living in same residence 5 years ago | .340** | .342** |
| Change in percentage of owner-occupied housing | .166† | .169† |
| Change in percentage of total population living below the poverty line | -.013 | -.051 |
| Change in percentage of foreign-born population | .046 | -.0055 |
| Change in percentage of Hispanic/Latino/Spanish population | .0054 | .0131 |
| Percent change in racial heterogeneity (including Hispanic) | .118 | -.016 |
| 1990 percentage of population under 18 that is black | -.430** | -.478** |
| Change in juvenile drug arrest rate | .050 | .335** |
| Change in poverty concentration | .265** | .269** |

n=129

** p<.01; * p<.05; † p<.10

Multivariate Models

Below, we present two sets of models, one for the early change period and one for the late change period. Each set consists of three models: the first includes all variables except the change in adult violence and the 1994-1995 rate of juvenile violence; the second includes all variables except the 1994-1995 rate of juvenile violence; and the third includes all variables. This sequencing enables us to see how the estimated effects and explanatory power of changes in community characteristics are affected when one controls for changes in adult violence (which, as discussed earlier, controls for changes in a number of unmeasured factors) and regression to the mean. In addition, we dropped the percentage of persons living below the poverty line from the multivariate models because this characteristic did not change significantly over time in these counties (see Table 1) and because our analysis includes other measures of poverty that did change significantly (poor families and concentrated poverty).

Early-Change Models (1994-1995 to 1997-1998)

Table 3 presents unstandardized regression coefficients and corrected standard errors (in parentheses) for the early change models. As shown, the predictive value of the models is generally high, ranging from 68% of variance explained (model 1) to 84% (model 3). Looking across models 1 through 3, however, there is substantial variability in the results. Several

variables that were statistically significant in model 1 became non-significant or changed direction in models 2 and 3. Hence, some of these factors may be related to juvenile violence primarily through an association with adult violence or perhaps with other factors causing both juvenile and adult violence. Adjusting for juvenile violence at the start of the study period (i.e., controlling for regression to the mean) also altered a number of the findings, changing the direction of some associations and/or revealing statistically significant relationships that were suppressed in other models. However, there was more consistency between the results of models 2 and 3; model 3 had more statistically significant associations than did model 2, but with the exception of a non-linear effect for children with married parents, there were no significant factors in model 2 that were not so in model 3.

Focusing on model 3 as our best assessment and highlighting results that were at least statistically significant at the 10% ($p \leq 0.1$) level, we see that changes in juvenile violence had significant positive associations with changes in adult violence, unemployment, racial heterogeneity, and concentrated poverty. Conversely, changes in juvenile violence had statistically significant, negative associations with changes in poor families, children living with married parents, the divorce rate, and the Hispanic population. Juvenile violence had a non-linear relationship with immigration, as shown by the significant coefficients for both percent foreign-born and the square of percent foreign-born. This implies that juvenile violence rose with increases of up to roughly two percentage points in the foreign born population; however, the effect leveled off and reversed with larger increases in immigration.¹⁵ As expected, juvenile violence also declined more in counties where it was higher in 1994-1995 and in counties with a higher percentage of youth who were black in 1990. Results that were most consistent across models included those for adult violence, children living with married parents, the divorce rate, immigration, racial heterogeneity, poverty concentration, and the black youth population.

Assessing these results in light of the community changes shown in Table 1 suggests that the drop in juvenile violence between 1994 and 1998 was caused in part by, or at least associated with, reductions in adult violence, unemployment, and concentrated poverty, as well as increases in divorce and the Hispanic population. Other dynamic correlates of juvenile violence, including poor families, children living with married parents, immigration, and racial heterogeneity, changed in directions that operated counter to the drop in juvenile violence, according to our model.¹⁶ For example, the percentage of children living with married parents was related inversely to juvenile violence as expected; however, this percentage dropped during the 1990s, thus operating against the decline in juvenile violence.

¹⁵ This tipping point is calculated as $b1 / (-2 * b2)$, where $b1$ is the coefficient for the main variable and $b2$ is the coefficient for the square of the main variable.

¹⁶ With respect to immigration, the average change in the percent of the population that was foreign-born should have produced a net increase in juvenile violence even after taking into account its non-linear effect.

**Table 3:
Unstandardized Coefficients and Corrected Standard Errors (in parentheses) for Weighted
Least Squares Regressions of Change in Juvenile Violence on Explanatory Variables (Early
Change Model, 1994-1998)**

| Variable | Model 1 | Model 2 | Model 3 |
|--|-------------------------|-------------------------|-------------------------|
| Juvenile violent crime arrest rate, 94/95 | X | X | **-.1914 (.0210) |
| Change in adult violent crime arrest rate 94/95 to 97/98 | X | **-.8101 (.1371) | **-.6202 (.1567) |
| Percent change in total population, 1990-2000 | -.3394 (.7818) | -.4927 (.7967) | .4563 (.6988) |
| Change in percentage of families with related children under 18 living below the poverty line, 1990-2000 | †11.6861 (6.9719) | 1.8267 (6.9158) | †-8.7036 (4.8381) |
| Percent change in median family income, 1990-2000 | *2.6534 (1.2487) | 1.4471 (1.2277) | -.0816 (1.0052) |
| Change in percentage of children under 18 living with married parents, 1990-2000 | ** -19.4201 (4.7032) | ** -14.1129 (4.2843) | ** -13.3524 (3.8004) |
| Change in percentage of the divorced population, 1990-2000 | -18.5925 (17.5145) | †-30.1032 (16.5303) | *-37.4737 (15.4568) |
| Change in percentage of the unemployed population, 1990-2000 | -7.3308 (7.4764) | 2.1569 (7.6237) | **18.1478 (6.1799) |
| Change in percentage of the population that is males 12-17, 1990-2000 | 7.0083 (32.5103) | 37.2118 (32.8307) | 42.5391 (27.2077) |
| Change in percentage of individuals 5 years and older living in same residence 5 years ago, 1990-2000 | †5.9606 (3.1515) | 2.0626 (2.8512) | 1.4560 (2.4262) |
| Change in percentage of owner-occupied housing, 1990-2000 | 8.8514 (6.3707) | 8.7293 (7.0457) | -3.6879 (6.3276) |
| Change in percentage of foreign-born population, 1990-2000 | **18.1138 (3.3790) | **14.6247 (3.5030) | **7.0349 (2.0782) |
| Change in percentage of Hispanic/Latino/Spanish population, 1990-2000 | ** -16.9916 (3.2149) | **13.2422 (3.1349) | ***-10.9966 (2.7346) |
| Percent change in ethnic heterogeneity (including Hispanic), 1990-2000 | *.0061 (.0025) | ** .0072 (.0025) | ** .0066 (.0024) |
| 1990 percentage of population under 18 that is black | ** -3.7741 (.7317) | ***-4.1260 (.6876) | ** -1.6788 (.5929) |
| Change in juvenile drug arrest rate, 94/95-97/98 | †-.1070 (.0643) | -.0282 (.0581) | .0445 (.0476) |
| Change in poverty concentration, 1990-2000 | *3.1233 (1.3686) | 2.0949 (1.3129) | †1.6337 (.8575) |
| Squared change in percentage of children under 18 living with married parents, 1990-2000 | ** -5.7335 (1.6795) | *-3.7527 (1.6511) | -.7141 (1.1755) |
| Squared change in percentage of the population that is foreign-born, 1990-2000 | ** -2.2006 (.6073) | ** -2.2401 (.6530) | ** -1.6421 (.4341) |
| R-squared | .68 | .71 | .84 |
| N | 125 | 126 | 126 |

** p<.01; * p<.05; † p<.10 (see highlighted table cells)

Models were weighted by the 1996 juvenile population of each county. Intercept term not shown.

Late Change Models (1994-1995 to 2000-2001)

Models examining the change in juvenile violence from 1994-1995 to 2000-2001 are presented in Table 4. The variance explained in these models ranged from 55% (model 1) to 93% (model 3). Inferences regarding the predictors (in terms of both direction and statistical significance) were again sensitive to model specification, even more so than was true for the early change models. Further, there were substantial differences between these results and those of the early change models. For one, the late change models had fewer statistically significant findings.

Changes in adult violence, residential stability, and poverty concentration, all of which had positive associations with juvenile violence, were the most consistent predictors across models (residential stability appeared to have a non-linear relationship to juvenile violence in two models, but this did not hold in the final model). Focusing on the late change version of model 3, other significant predictors (at the $p \leq .10$ level or better) included unemployment and juvenile drug arrests, both of which had a positive association with the trend in juvenile violence. In addition, poor families, owner-occupied housing, and the 1994-1995 level of juvenile violence had significant inverse correlations with the change in juvenile violence. Considering these results in light of the community changes in Table 1 suggests that reductions in adult violence, unemployment, juvenile drug involvement, and poverty concentration contributed to greater declines in juvenile violence from 1994 to 2001. An increase in owner-occupied housing (which implies an improvement in community capacity) was also linked to the downturn in juvenile violence.¹⁷

¹⁷ UCR coverage indicators dropped to under 80% for a small number of counties during 2000 and 2001. To test the sensitivity of our results to this issue, we estimated another version of model 3 with an indicator for each county's average UCR coverage level for 2000 and 2001. This variable was statistically insignificant, and its inclusion had no impact on the substantive inferences from the model.

Table 4:
Unstandardized Coefficients and Corrected Standard Errors (in parentheses) for Weighted Least Squares Regressions of Change in Juvenile Violence on Explanatory Variables (Late Change Model, 1994-2001)

| Variable | Model 1 | Model 2 | Model 3 |
|---|------------------------|------------------------|-----------------------|
| Juvenile violent crime arrest rate, 94/95 | X | X | **-.4115 (.0245) |
| Change in adult violent crime arrest rate 94/95 to 00/01 | X | **-.9411 (.1186) | **-.4412 (.1093) |
| Percent change in total population, 1990-2000 | -.8424 (1.3216) | .7655 (.8608) | .3742 (.6552) |
| Change in percentage of families with related children under 18 living below the poverty line, 1990-2000 | 3.9207 (11.6018) | 10.8374 (9.4418) | *-14.0824 (5.7689) |
| Percent change in median family income, 1990-2000 | *6.2822 (2.5340) | 2.6938 (1.8032) | .5519 (1.0955) |
| Change in percentage of children under 18 living with married parents, 1990-2000 | *-22.3712 (8.9734) | .1405 (5.9568) | -5.6781 (4.3518) |
| Change in percentage of the divorced population, 1990-2000 | -14.0533 (32.9085) | 1.8623 (24.1158) | -9.1308 (16.5652) |
| Change in percentage of the unemployed population, 1990-2000 | -4.7686 (13.2445) | -2.7052 (10.4656) | *16.6106 (6.7821) |
| Change in percentage of the population that is males 12-17, 1990-2000 | 57.0415 (63.6282) | 34.8608 (47.7688) | 46.7443 (28.8335) |
| Change in percentage of individuals 5 years and older living in same residence 5 years ago, 1990-2000 | *22.0573 (9.3970) | **17.9183 (6.8482) | *10.4042 (4.4642) |
| Change in percentage of owner-occupied housing, 1990-2000 | 5.8441 (9.8486) | 1.4658 (6.9269) | *-13.0402 (5.7783) |
| Change in percentage of foreign-born population, 1990-2000 | 3.8844 (9.8225) | -8.0037 (5.2733) | -.6293 (3.8946) |
| Change in percentage of Hispanic/Latino/Spanish population, 1990-2000 | -2.9608 (7.0001) | .1876 (4.3880) | -3.2415 (3.2455) |
| Percent change in ethnic heterogeneity (including Hispanic), 1990-2000 | .0035 (.0031) | *.0053 (.0024) | .0013 (.0017) |
| 1990 percentage of population under 18 that is black | **-.4.4720 (1.4229) | **-.5.1196 (1.0076) | .1730 (.7520) |
| Change in juvenile drug arrest rate, 94/95-00/01 | .0889 (.0656) | -.0389 (.0550) | †.0592 (.0306) |
| Change in poverty concentration, 1990-2000 | *5.4814 (2.5272) | -.0672 (1.8425) | **2.9592 (1.0333) |
| Squared change in percentage of individuals 5 years and older living in same house 5 years ago, 1990-2000 | *-2.4515 (1.0308) | †-1.3975 (.7776) | -.5950 (.5028) |
| R-squared | .55 | .73 | .93 |
| N | 126 | 123 | 123 |

** p<.01; * p<.05; † p<.10 (see highlighted table cells)

Models were weighted by the 1996 juvenile population of each county. Intercept term not shown.

DISCUSSION

To summarize, our analysis has identified a number of community-level factors that were associated with trends in juvenile violence in the nation's largest counties from 1994 to 2001. These included adult violence, unemployment, concentrated poverty, the black youth population, racial/ethnic heterogeneity, immigration, the Hispanic population, poor families, family structure (both the divorce rate and the percentage of children living with married parents), residential stability, juvenile drug arrests, owner-occupied housing, and the level of juvenile violence at the start of the study period. Some of these factors were more strongly associated with changes in juvenile violence from 1994 to 1998 (i.e., the share of youth who were black, racial/ethnic heterogeneity, the Hispanic population, immigration, and family structure), while others were more strongly associated with changes over the longer period of 1994 to 2001 (i.e., residential stability, owner-occupied housing, and juvenile drug arrests). Consequently, different factors may have influenced the early and late stages of the crime drop. The most consistent predictors of juvenile violence across both periods were adult violence, unemployment, concentrated poverty, poor families, and the county's level of juvenile violence at the start of the study period.

However, some of these community characteristics were not related to juvenile violence as expected. For example, changes in poor families with children were related inversely to changes in juvenile violence, suggesting that the overall decrease in poor families that occurred in these counties during the 1990s was associated with increases or, more often, smaller decreases in juvenile violence. This is contrary to expectations but could have been due to our use of simultaneous statistical controls for trends in family structure and concentrated poverty. Other variables that were related to juvenile violence in unexpected ways included the divorce rate and residential stability. The inverse relationship between the divorce rate and juvenile violence in the early change models was perhaps due in part to a reduction in family conflict and child abuse stemming from the separation of distressed families. It may also be linked to other social changes, such as economic revitalization and growth in the prevalence of older, more affluent groups in some communities. The positive association between residential stability and juvenile violence in the late change models, on the other hand, may reflect a link between juvenile violence and communities that are stagnant and socially isolated due to poor and/or aging populations and a lack of economic growth or revitalization. In other words, many distressed communities simply have a greater prevalence of people who lack the economic resources to move.

There are a number of caveats to the findings. As noted, changes in many of the community characteristics were measured from 1990 to 2000, while those for juvenile violence were measured from 1994 to 1998 and from 1994 to 2001. Consequently, our measures of change in several community characteristics may not provide an accurate indication of how these factors were changing between 1994, 1998, and 2001.

Another qualification is that the results could have been affected by aggregation bias. Despite our stated reasons for studying juvenile violence at the county level, an analysis of this sort poses some risk of relating changes in suburban communities to changes in crime that were largely attributable to central cities (and to smaller places within the central cities). Hence, the

impact of these community factors on juvenile violence may have varied across different types of areas within these counties.

A related point is that the model coefficients reflect average effects across counties. Community characteristics that did not play a significant role in the general trend across counties according to our analysis may have nonetheless had important effects in some subsets of counties. It is also possible that changes in these conditions had interactive effects on juvenile violence that are not readily apparent from this analysis.

Yet a final caveat is that juvenile violence declined in nearly all of these counties during the decade. The findings are thus more indicative of how changes in community characteristics affected rates of decline in juvenile violence than of whether these changes actually caused the decline.

Taken at face value, nonetheless, our best models suggest that reductions in adult violence, unemployment, concentrated poverty, and juvenile drug offending accelerated reductions in juvenile violence between 1994 and 2001, as did increases in owner-occupied housing, divorce, and the Hispanic population. Juvenile violence also declined more in counties where it was higher in the early 1990s and in counties that had larger populations of black youth, though the latter effect was weakened and sometimes became statistically non-significant when controlling for the former effect. Other significant correlates of juvenile violence changed in ways that worked counter to its prevailing downward trend, thus slowing its rate of decline. Table 5 summarizes the direction of association for each variable that was statistically significant in the early and/or late change analysis and shows whether each of these indicators changed in a way that was consistent with the reduction in juvenile violence.

Table 5: Direction of Association and Change for Community Characteristics Related to Juvenile Violence*

| Variable | Relationship to Juvenile Violence | | Direction of Change and Association Consistent with Drop in Juvenile Violence? |
|---|-----------------------------------|-----------|--|
| | 1994-1998 | 1994-2001 | |
| Adult violence | + | + | Yes |
| Percentage of families with children in poverty | - | - | No |
| Percentage of children under 18 living with married parents | - | n/s | No |
| Percentage divorced | - | n/s | Yes |
| Percentage unemployed | + | + | Yes |
| Percentage foreign-born | +/-- (non-linear) | n/s | No |
| Percentage Hispanic | - | n/s | Yes |
| Racial/ethnic heterogeneity | + | n/s | No |
| Percentage of juvenile population that was black in 1990 | - | n/s | Not applicable |
| Poverty concentration | + | + | Yes |
| Percentage living in same residence 5 years ago | n/s | + | No |
| Percentage of owner-occupied housing | n/s | - | Yes |
| Juvenile drug arrest rate | n/s | + | Yes |
| Juvenile violent crime arrest rate, 94/95 | - | - | Not applicable |

* Based on variables with p values of ≤ 0.1 in model 3 of the early or late change analyses.
n/s denotes statistically non-significant relationship; † denotes non-linear relationship

Additional caution is warranted in assessing the magnitude of these effects. For example, the average unemployment rate in these counties declined by 0.14 of a percentage point between 1990 and 2000 (see Table 1). This suggests that unemployment reduced arrests for juvenile violence by about 2.3 per 100,000 between 1994 and 2001 (see model 3 of Table 4),¹⁸ which amounts to only about 1% of their actual decline during this period (which, as shown in Table 1,

¹⁸ This is calculated as $0.14 * 16.6106$ (the regression coefficient for unemployment in model 3 of the late change analysis).

was 232 per 100,000). At the national level, however, unemployment declined nearly two percentage points (from 6.1% to 4%) between 1994 and 2000 after rising during the first years of the decade (see Chapter 3 of the Whys report). If unemployment trends in these counties followed a similar pattern, they may have exerted stronger effects on juvenile violence than implied by these results (perhaps on the order of 14% extrapolating from our model results and the national figures).

Similar concerns apply to the interpretation of effects from other variables that were measured as changes from 1990 to 2000. Tentative extrapolations based on the 1990 to 2000 changes for poverty concentration and owner occupied housing suggest that they contributed to 3% and 9% of the juvenile crime drop, respectively. Changes in the divorced and Hispanic populations, on the other hand, were associated with roughly a third of the crime drop that occurred between 1994 and 1998.

Effect sizes can be calculated more precisely for changes in adult violence and juvenile drug arrests, which were both measured for the same years as were changes in juvenile violence. In both the early and late change analyses, model 3 suggests that the drop in adult violence (see Table 1) may have caused 9% to 10% of the decline in juvenile violence.¹⁹ As discussed previously, this could represent influences that adult crime has on juvenile crime through community capacity and/or co-offending, the influences of unmeasured factors affecting both adult and juvenile crime (e.g., changes in criminal justice practices and policies), or some combination of these influences. The decline in juvenile drug involvement that occurred late in the decade (i.e., from 1998 to 2001—see Table 1) appears to have contributed no more than about 1% to the decline in juvenile violence from 1994 to 2001.²⁰

To a great extent, the rate of decline in juvenile violence was determined by the level of juvenile violence in the early 1990s. Results from the late change models, for example, suggest that a county with an average rate of juvenile violence in 1994 and 1995 would have experienced a decline of about 249 per 100,000 in its rate of juvenile violence by the start of the next decade, net of other factors. This predicted change is greater than the decline of 232 per 100,000 that actually occurred in the average rate of juvenile violence during this period.²¹ Simply put, juvenile violence fell most in those places where it had the farthest to fall. While interpreting this as regression to the mean is arguably an oversimplification, it does suggest that the decline in juvenile violence was largely driven by a secular trend—perhaps representing a host of social,

¹⁹ For example, the average rate of adult violence declined by 16.61 per 100,000 from 1994-1995 to 1997-1998 (Table 1). Multiplying this by the coefficient from model 3 of the early change analysis (.6202—see Table 3) suggests that the drop in adult violence reduced the rate of juvenile violence by 10.3 per 100,000. This amounts to 9% of the 110.3 drop in the rate of juvenile violence that occurred during this period.

²⁰ The average rate of juvenile drug arrests dropped by 38.18 from 1994-1995 to 2000-2001 (Table 1). Model 3 of the late change analysis (Table 4) suggests that this reduced the rate of juvenile violence by $-38.18 * .0592 = -2.26$, which is equivalent to about 1% of the reduction in the average rate of juvenile violence during these years (Table 1).

²¹ This is calculated by multiplying the average rate of juvenile violence in 1994-1995 (604.67 per 100,000) and multiplying it by the coefficient for the time 1 juvenile violent crime rate in model 3 of the late change analysis (-0.4115). Results from the early change model also produce a predicted change greater than the actual change that occurred during that period.

cultural, and/or policy factors—operating independently of the changes in the community characteristics examined in this analysis. (Chapters 4 and 5 of the Whys report examine cultural and policy factors that may have affected recent trends in juvenile crime.)

Table 6: Study Jurisdictions

| COUNTY | STATE |
|-------------------------|-------|
| Jefferson County | AL |
| Madison County | AL |
| Mobile County | AL |
| Pulaski County | AR |
| Maricopa County | AZ |
| Pima County | AZ |
| Contra Costa County | CA |
| Fresno County | CA |
| Los Angeles County | CA |
| Monterey County | CA |
| Orange County | CA |
| Riverside County | CA |
| Sacramento County | CA |
| San Bernardino County | CA |
| San Diego County | CA |
| San Francisco County | CA |
| San Joaquin County | CA |
| San Mateo County | CA |
| Santa Barbara County | CA |
| Santa Clara County | CA |
| Solano County | CA |
| Sonoma County | CA |
| Stanislaus County | CA |
| Tulare County | CA |
| Ventura County | CA |
| Fairfield County | CT |
| Hartford County | CT |
| New Haven County | CT |
| Honolulu County | HI |
| Polk County | IA |
| Ada County | ID |
| Marion County | IN |
| St. Joseph County | IN |
| Jefferson County | KY |
| East Baton Rouge Parish | LA |
| Jefferson Parish | LA |
| Norfolk County | MA |
| Suffolk County | MA |
| Anne Arundel County | MD |
| Baltimore City | MD |
| Baltimore County | MD |
| Montgomery County | MD |
| Prince George's County | MD |
| Cumberland County | ME |

| | | |
|--------------------|----|----|
| Genesee County | | MI |
| Kent County | MI | |
| Oakland County | MI | |
| Wayne County | MI | |
| Anoka County | MN | |
| Dakota County | MN | |
| Hennepin County | MN | |
| Jackson County | MO | |
| St. Louis City | MO | |
| Cumberland County | NC | |
| Forsyth County | NC | |
| Guilford County | NC | |
| Mecklenburg County | NC | |
| Wake County | NC | |
| Bergen County | NJ | |
| Burlington County | NJ | |
| Camden County | NJ | |
| Essex County | NJ | |
| Hudson County | NJ | |
| Mercer County | NJ | |
| Middlesex County | NJ | |
| Monmouth County | NJ | |
| Morris County | NJ | |
| Ocean County | NJ | |
| Passaic County | NJ | |
| Somerset County | NJ | |
| Union County | NJ | |
| Clark County | NV | |
| Washoe County | NV | |
| Albany County | NY | |
| Bronx County | NY | |
| Dutchess County | NY | |
| Erie County | NY | |
| Kings County | NY | |
| Monroe County | NY | |
| Nassau County | NY | |
| New York County | NY | |
| Onondaga County | NY | |
| Orange County | NY | |
| Queens County | NY | |
| Richmond County | NY | |
| Rockland County | NY | |
| Westchester County | NY | |
| Franklin County | OH | |
| Lucas County | OH | |
| Oklahoma County | OK | |
| Tulsa County | OK | |
| Clackamas County | OR | |
| Lane County | OR | |
| Marion County | OR | |
| Multnomah County | OR | |
| Washington County | OR | |
| Allegheny County | PA | |
| Berks County | PA | |

| | |
|---------------------|----|
| Bucks County | PA |
| Chester County | PA |
| Delaware County | PA |
| Erie County | PA |
| Lancaster County | PA |
| Lehigh County | PA |
| Montgomery County | PA |
| Philadelphia County | PA |
| Westmoreland County | PA |
| Providence County | RI |
| Charleston County | SC |
| Greenville County | SC |
| Richland County | SC |
| Davidson County | TN |
| Bexar County | TX |
| Cameron County | TX |
| Collin County | TX |
| Dallas County | TX |
| Denton County | TX |
| El Paso County | TX |
| Fort Bend County | TX |
| Harris County | TX |
| Hidalgo County | TX |
| Montgomery County | TX |
| Nueces County | TX |
| Tarrant County | TX |
| Fairfax County | VA |
| Virginia Beach City | VA |
| Clark County | WA |
| Pierce County | WA |
| Spokane County | WA |

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