ECONOMIC CONDITIONS, DETERRENCE AND JUVENILE
CRIME: EVIDENCE FROM MICRO DATA

H. Naci Mocan
Daniel I. Rees

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H. Naci Mocan and Dainel I. Rees
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## ABSTRACT

This is the first paper to test the economic model of crime for juveniles using micro data. It uses a nationally representative sample of 16,478 high school children surveyed in 1995. The sample includes not only detailed information on offenses, but also data on personal, family and neighborhood characteristics as well as deterrence measures. We analyze the determinants of selling drugs, committing assault, robbery, burglary and theft, separately for males and females.

We find that an increase in violent crime arrests reduces the probability of selling drugs and assaulting someone for males, and reduces the probability of selling drugs and stealing for females. An increase in local unemployment increases the propensity to commit crimes, as does local poverty. Similarly, family poverty increases the probability to commit robbery, burglary and theft for males, and assault and burglary for females. Local characteristics are more important for females than males. The results also indicate that family supervision has an impact on delinquent behavior.

These results show that juveniles *do* respond to incentives and sanctions as predicted by economic theory. Employment opportunities, increased family income and more strict deterrence are effective tools to reduce juvenile crime.

H. Naci Mocan
University of Colorado at Denver
Department of Economics
Campus Box 181, PO Box 173364
Denver, CO 80217-3364
and NBER
nmocan@carbon.cudenver.edu

Daniel I. Rees
University of Colorado at Denver
Department of Economics
Campus Box 181, PO Box 173364
Denver, CO 80217-3364
drees@carbon.cudenver.edu

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## Evidence from Micro Data

I. Introduction

The American public ranked crime as the most important problem facing the nation in 1999 (Gallup Organization, 1999). Juvenile crime, in particular, has received a great deal of attention from the public, the media (Washington Post 1999, Los Angeles Times 1999, Newsweek 1999), and social scientists. Some analysts argue that very little, if anything, can be done to discourage young Americans from participating in illegal activities. For example, DiIulio (1996) indicates that urban ethnographers believe that today's crime-prone youngsters are too present oriented for any type of conventional criminal deterrence to work. Similarly, Bennett, DiIulio and Walters (1996) state that "America is now home to thickening ranks of juvenile 'super-predators'—radically impulsive, brutally remorseless youngsters, including even more preteenage boys, who murder, assault, rape, rob, burglarize, deal deadly drugs, join gun-toting gangs, and create serious communal disorder. They do not fear the stigma of arrest, the pains of imprisonment, or the pangs of conscience... To these mean-street youngsters, the words 'right' and 'wrong' have no fixed moral meaning."[1]

However, the notion of an irrational "new-breed" of juvenile criminal who does not respond to incentives is based on anecdotal as opposed to strong empirical evidence. Moreover, it contradicts the economic model of crime developed by Becker (1968) and tested using aggregate data and micro data on the adult population (e.g., Witte 1980, Cornwell and Trumbull 1994, Levitt 1997, Corman and Mocan, forthcoming). In recent work, using state-level data, Levitt (1998) found that the juvenile crime rate is negatively related to the severity of penalties, indicating that the economic model of crime applies to juveniles as well as adults. Furthermore, the sharp increase in the juvenile crime in late-1980s, and the drop in the mid-1990s implies that juvenile crime may be more malleable than suggested.

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[1] Bennet, DiIulio and Walters (1996) as cited by Levitt (1998).

Investigation of the determinants of juvenile crime is important, not only because of the nature of the problem, but also because of the implications of juvenile crime for adolescents' behavior in the future. For example, Mocan and Overland (1999) show that current criminal activity makes future criminal activity more likely by simultaneously increasing the criminal human capital of the participant and depreciating his legal human capital, and Bound and Freeman (1992) document a negative relationship between criminal participation and labor market attachment, stating that "…the growth rate of the population with a criminal record accounts for one third of the longer run erosion of employment [of black male high school dropouts]." In addition, Freeman and Rodgers (1999) show that areas with the most rapidly rising rates of incarceration are areas in which youths, particularly black youths, have had the worst earning and employment experience between the mid 1980s and late 1990s, suggesting a negative relationship between labor market outcomes and a criminal record.

There is no study in the economics literature that investigates the determinants of juvenile crime using micro data, although three papers have analyzed the behavior of young adults. Viscusi (1986) used data on 2,358 black men ages 16 to 24, living in Boston, Chicago and Philadelphia in 1979. Tauchen, Witte and Griesinger (1994) analyzed the criminal activity of 567 men ages 19-25 who were born in Philadelphia in 1945, and Grogger (1998) used the NLSY to investigate the determinants of criminal behavior of 1,134 men ages 14-21 in 1980. Although these papers provide interesting insights into the determinants of criminal activity for young adults, they all have limitations. The Viscusi (1986) and Tauchen et al. (1994) samples are not nationally representative, and all three papers lack good measures of criminal activity or legal sanctions.[2] Furthermore, none of these papers use data on recent cohorts, around whom the current debate centers, and none specifically analyze juvenile delinquency.[3]

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[2] In Tauchen et al. (1994) criminal activity is measured by being arrested, or by a crime seriousness index. In Viscusi (1986) criminal activity is measured by committing any crime; and Grogger (1998) considers only property crimes. Viscusi (1986) and Grogger (1998) have no measures of deterrence.

[3] Viscusi analyzes young adults who are born between 1955 and 1963; Grogger (1998) analyzes young adults whose birthdays are between 1959 and 1964, and Tauchen et al. (1994) sample uses young adults born in 1945.

The criminology literature on juvenile crime is more extensive, but it too has limitations. Often the measure of criminal involvement is based on arrest records, or is based on parent/teacher reports (Wright, Cullen and Williams, 1997). Most researchers use either small samples (e.g. n= 200 in Baron and Hartnagel 1997), or data from a single city or region (e.g. data from Alberta, Canada in LaGrange and Silverman 1999; Dunedin, New Zealand in Wright et al. 1999; Rochester, New York in Smith and Thornberry 1995). No study simultaneously controls for the effects of economic and deterrence variables as well as personal and family characteristics.

An ongoing debate in crime literature is the relative importance of labor market opportunities and criminal sanctions on the level of criminal activity. Freeman (1983), reviewed a number of studies employing measures of criminal sanctions and labor market conditions. He concluded that sanctions have a greater impact on criminal behavior than do labor market factors: that is, the "stick" seems to be more effective than the "carrot." The findings of Corman and Mocan's recent time-series analysis (forthcoming) also provide some support for this conclusion. They found that poverty is positively related to homicides, but arrests and police force have a negative impact on a variety of criminal activities. In contrast, researchers using data on prison releases have reported mixed results with regard to the relative importance of deterrence versus labor market opportunities (e.g. Witte 1980, Myers 1983). Information on the importance of deterrence versus labor market conditions is absent for juvenile crime.

This paper presents the first economic analysis of juvenile crime using individual-level data. The nationally representative sample includes not only detailed information on offenses, but also data on personal, family and neighborhood characteristics as well as deterrence measures. Because individual-level, as opposed to aggregate data, are used, the estimated relationships between sanctions and criminal activity represent the impact of deterrence. Put differently, they don't suffer from potential confounding of the incapacitation effect that necessarily emerges in aggregate data (e.g., Corman and Mocan, forthcoming; Levitt, 1998). We analyze the determinants of selling drugs, committing assault, robbery, burglary and theft, and find that juvenile crime *is* responsive to sanctions and incentives as predicted by economic

theory.

II. The Data

The primary data source for this project is the National Longitudinal Study of Adolescent Health "Wave I In-home Interview." These data come from a nationally representative survey of students in grades 7 through 12. The Wave I In-Home Interview was completed by 20,745 adolescents, both males and females, between September 1994 and December 1995. Detailed demographic information such as religion, race/ethnicity, parents' education, and family structure are available in the data.

After deleting individuals 18 years of age and older, and individuals with missing information, our sample contains 16,478 observations. Descriptive statistics are presented in Table 1. The sample is almost evenly split between males and females, and non-whites are over-sampled. The overwhelming majority of individuals in the sample (96 percent) are between the ages of 13 and 17 at the time of the survey. The minimum age is 11, but only 13 individuals (0.08 percent of the sample) are 11 years of age, and 16 percent of the sample are thirteen or younger. Twenty-four percent are black, 7 percent are Asian, 2 percent are Native American, and 9 percent of the sample indicated that they belonged to some other race. Seventeen percent of the sample are of Hispanic origin. Ten percent indicated that their father did not have a high school degree, and 14 percent indicated that their mother did not have a high school degree. Sixty-six percent of the adolescents lived with two parents, and 12 percent indicated that their family was on welfare.

Because of confidentiality concerns, the geographical location of the respondents are not included in the data. However, each individual in the data set is matched with relevant characteristics of the county of residence. These variables, which include the unemployment rate, the population density, measures of urbanization, and racial makeup are obtained from the 1990 Census of Population and Housing. Means and standard deviations of these variables are reported in the second part of Table 1.

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The third part of Table 1 contains additional county level information, such as per capita police and welfare spending in the county, the proportion of the county population who voted Democratic and the proportion who voted for Ross Perot in the 1992 presidential elections. These variables are obtained from USA Counties (Bureau of the Census, 1994), and are intended to capture local-area characteristics that may impact criminal behavior (Glaeser et al. 1996, Sah 1991).

The final three variables reported in Table 1 are the crime rate, and the arrest rates for violent and property crimes in the county of residence, all obtained from the FBI Uniform Crime Reports.

The survey includes a number of detailed questions with regard to delinquent behavior. Specifically, respondents were asked if in the past 12 months they had committed any of the following acts: assault, robbery, burglary, theft, and the selling of drugs. Individuals who replied in the affirmative were then asked whether they engaged in each of these acts on one or two occasions, three or four occasions, or five or more occasions. The reliability and validity of self-reported data are well established, and self-repoted data and official crime data generally yield similar information (Hindelang, Hirschi and Weis 1981, Elliott and Voss 1974). A comparison of the extent of juvenile crime obtained from our data and the one inferred from official data is presented later in the paper.

Table 2 displays the descriptive statistics of juvenile criminal participation. Seven and three-tenths percent of juveniles sold marijuana or other drugs during the past 12 months; 19.4 percent assaulted someone, 4.4 percent committed robbery, 5.4 percent committed burglary, and 5.6 percent stole something worth more than $50. Roughly half of those who sold drugs did so one or two times. The rate is approximately 70 percent for those who committed robbery, burglary or theft. Seventy-six percent of those who assaulted someone did so one or two times during the 12 month period.

The frequency of criminal activity by race and gender is displayed in the first panel of Table 3. The cells present the proportion of males and females who committed at least one crime (selling drugs, assault, robbery, burglary, or theft) over the course of

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the year.  Forty-six percent of male Native-American juveniles and 40 percent of black male juveniles committed at least one crime during the 12 month period preceding the survey.  The rates are 35 percent for white males and 31 percent for Asian males.  The rates for females are approximately half that of males for each race.  The second panel of Table 3 displays the proportion of juveniles who committed different types of crimes by gender.  Only one percent of males committed all five crimes, and 23.5 percent committed only one type of crime.

Table 4 displays the prevalence of different offenses by race and gender.  Regarding selling drugs, Asians have the lowest commission rate with 6.6 percent for males and less than 3 percent for females.  In contrast, almost one out of five Native American male adolescents sold drugs at least once during the past year. The participation rates for males range from 4 to 9 percent for robbery, 7 to 14 percent for theft, and 6 to 12.5 percent for burglary among races.  The rates for assault range from 23 percent to 35 percent.  Native American juveniles have the highest crime rates in all crime categories, and Asian juveniles have the lowest crime rates.

It has been recognized that males commit more criminal offenses than females (Gottfredson and Hirshi 1990,  Henggeler 1989, Horwitz and White 1987).   Consistent with previous reports, our data set reveals that female juveniles offend at about half the rate of their male counterparts.  Criminologists and sociologists have developed a number of theories to explain the contrast in criminal behavior between the genders.  It has been argued that gender differences in delinquent behavior can be attributed to differential supervision of families for their sons and daughters (e.g. Hagan, Simpson and Gillis 1979), or to the difference in self-control between the sexes (Gottfredson and Hirschi 1990).  The contrast in delinquent behavior can also be attributed to differences in risk aversion (Powell and Ansic, 1997), discount rates ( Lau and Williams 1998), or the motivation for security (Schnieder and Lopes, 1986).  To account for these differences, models are estimated separately for males and females.

Descriptive statistics presented in Table 5  suggest relationships between juvenile crime, family structure, and family poverty as measured by welfare status. Seventy-five percent of the adolescents who come from a two-parent household do not

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engage in any crime; while the rate is 67 percent for those who come from one or no-parent families. Similar differences in crime commission rates are observed for those who are involved in one, two, three or four different types of crimes. The propensity to commit a particular crime is also lower for those juveniles who come from two-parent families. For example, 6.3 percent of the juveniles who have two parents sell drugs, while the rate is 9.5 percent for those who have one or no parent. The same regularity is observed for juveniles whose families are on welfare. The bottom two panels of Table 5 show that juveniles from families receiving public assistance have a higher propensity to commit any given crime, and are, in general, more likely to engage in criminal behavior.

III. Juvenile Crime in the U.S.

Column I of Table 6 displays the population-weighted juvenile crime participation rates for different offenses obtained from our data set. For comparison purposes, column II presents the participation rates obtained from Wave 3 of the National Youth Survey, conducted in 1979 (Ploeger 1997). Although the two surveys are 15 years apart, the juvenile crime rates are of the same general magnitude. However, in our data, which depict juvenile criminal behavior 1994-95, the participation rates for burglary and theft are higher, whereas the participation rates for selling drugs is lower.

Using the crime commission rates calculated from our data and employing population weights, we estimated the number of juveniles who committed different crimes in the U.S. in 1994. The results, which are reported in column III of Table 6, indicate that in 1994 1.2 million juveniles sold drugs, and almost 3.3 million juveniles assaulted someone. Eight-hundred and sixty-thousand juveniles were involved in theft, 866,000 committed burglary, and 725,000 committed robbery. Because the data set also contains information on the frequency of these offenses, we are able to calculate the total number of crimes committed by juveniles in each category. If the respondent indicated that he/she committed 1 to 2 offenses it is converted into 1.5 offenses. A report of 3 to 4 offenses is converted in 3.5 offenses; and if the respondent indicated that an offense is committed 5 or more times, it is converted into 5.5 crimes. Using this algorithm, we

calculated the total offenses committed for each crime, which is reported in column IV. There were 3.7 million drug sales by juveniles, and 7 million assaults. They committed a total of 1.7 million robberies, 2 million burglaries and 2 million thefts.

The above numbers can be compared to information obtained from official crime statistics. The Uniform Crime Reports (UCR) of the FBI relies on information compiled by local law enforcement agencies. The National Crime Victimization Survey (NCVS) of the Bureau of Justice Statistics gathers crime information by asking a nationally representative sample of persons ages 12 and above about crimes in which they were the victim. To obtain an estimate of juvenile crime in 1994 using official data, we followed the algorithm used by Levitt (1998), calculating the number of juvenile crimes as [JARR/TARR]*CRIME, where JARR is juvenile arrests, TARR is total arrests, and CRIME is the number of total crimes committed in a given category. This algorithm assumes that the proportion of juvenile arrests for a given type of crime is a good proxy for the proportion of juveniles actually committing that type of crime. The arrest information is obtained from the UCR, and the crime information is obtained from the NCVS. Column V displays the number of juvenile crimes suggested by the algorithm. Table 6 indicates that the imputation of juvenile crime using official arrest and victimization data may overstate the extent of juvenile theft, and understate juvenile assault and robbery.

IV. Basic Methodology and Results

Following the seminal work of Becker (1968) and its extensions by Ehrlich (1973) and Block and Heineke (1975), we postulate that participation in criminal activity is the result of an optimizing individual's reaction to incentives. More precisely, individuals engage in criminal activities depending upon the expected payoffs of the criminal activity, the return to legal labor market activity, tastes, and the costs of criminal activity, such as those associated with apprehension, conviction and punishment. Following this framework, the empirical implementation is depicted as follows:

$$(1) \quad C_{ij} = \alpha_j + X_{ij}'\beta_j + Y_{ij}'\gamma_j + Z_{ij}'\delta_j + \varepsilon_{ij},$$

where $C_{ij}$ is a dichotomous variable which takes the value of one if individual *i* participated in crime *j*, and zero otherwise. The vector X consists of individual characteristics, such as age, race, ethnicity and religion. It also includes family characteristics, such as parent education, family's welfare participation and family structure. The vector Y includes neighborhood characteristics, such as the county poverty as measured by per capita local welfare spending, and other county characteristics such as the population density and the proportion of population who are black or Hispanic. Following Levitt (1998), we also include the total number of crimes in the county per 100,000 population to control for the impact of omitted factors that may influence juvenile crime.

Legal employment opportunities are measured by the unemployment rate in the county. Although theoretically well-defined, the relationship between crime and unemployment is found to be modest in economics literature (Freeman 1983). Criminology literature includes conflicting results on unemployment-crime relationship (Kapuscinski, Braithwaite and Chapman, 1998).

The data set does not contain a measure of wages for juveniles. This is not a drawback because all individuals in the data set are high school students, and therefore, controlling for age, there should be little variation in wages. On the other hand, employment opportunities may vary significantly, and, in fact, area unemployment has been shown to have a sizable effect on the employment probability of young adults (Freeman and Rodgers 1999). The local unemployment in the data set pertains to 1990, while most of the crime information for juveniles pertains to 1994. To the extent that there is hysteresis in unemployment, this is not a major issue. Also, it should be noted that Freeman and Rodgers (1999) find that past unemployment has an independent effect on the current labor market outcomes of young workers.

The vector Z consists of variables that measure sanctions at the county level. They are the arrest rates per violent crime, the arrest rate for the property crimes and per capita local government spending on police protection. Our arrest variables pertain to the

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total arrest rates for violent and property crimes, instead of juvenile arrests, reducing the likelihood of reverse causality from individual criminal activity to total arrest rates. Perhaps of greater importance, the arrest variables correspond to 1993, while criminal activity pertains to 1994-95. Thus, an increase in the arrest rates in 1993 is assumed to impact juvenile delinquent behavior approximately one year later, but an increase in juvenile crime cannot change the arrest rates in the previous year. Police expenditures are measured in 1987, seven years prior to the behavior we are investigating. Admittedly, this is a long lag, even in the presence of high serial correlation in police spending. Further, this measure of police spending not only includes expenditures on police protection and other crime prevention activities, but also activities that have little or no impact on crime, such as traffic safety and vehicular inspection. These issues may make it difficult to detect a significant relationship between crime and police spending, but this is the only police expenditure available in the data. Tests for the exogeneity of the deterrence measures are carried out, and are explained below.

Tables 7A-7E present the results from probit models for criminal participation for males for five different crimes. The entries are the marginal effects, and the associated standard errors are reported in parentheses. Huber corrected standard errors are reported to account for within-county correlation between error terms.

*Selling Drugs*

Table 7A presents estimates of Equation (1) for selling drugs. All else equal, blacks have almost a 2 percent higher propensity to sell drugs. Asians are 3 percent less likely to sell drugs, and Native Americans are 10 percent more likely. Hispanic origin is associated with an increase in this probability of almost 3 percent. Age also has a positive impact on the likelihood of selling drugs. All else equal, adolescents who are 14 years old have almost a 10 percent higher probability of selling drugs in comparison to individuals in 12-to-13 year age group (the omitted category). Juveniles who are 15, 16 and 17 years of age are 13 percent, 16 percent and 18 percent more likely, respectively, to sell drugs.

Religious beliefs influence the selling of drugs. Adolescents who identified

themselves as Born Again Christians are 3 percent less likely to sell drugs. Juveniles who identified themselves as having no religious beliefs are 3 percent more likely to engage in the selling of drugs. This result is consistent with results reported by Freeman (1986), who showed that churchgoing affects the allocation of time, school attendance, work activity and deviant behavior, and helps youths escape from inner-city poverty. It can be argued that the link between religion and criminal activity is not causal, but unobservable characteristics of juveniles which affect their religious beliefs also influence their criminal behavior. Following Freeman (1986) we postulate that if religious beliefs are endogenous, rather than exogenous, the pattern of the relationship between independent variables and crime would be similar to the ones in an equation explaining religious belief. A probit model in which a dichotomous variable takes the value of one if the juvenile has no religion, and zero otherwise is estimated as a function of the same background variables in our crime equations. The results, which are reported in the Appendix (Table A1) show a different pattern of results than found from the crime regressions. For example, being of Hispanic origin lowers the probability of having no religious beliefs. Unemployment and two-parent household have no impact on religion, but the proportion of blacks, the proportion who voted Democratic or voted for Ross Perot in the county affect religious beliefs. Low-educated mothers make it less likely for male juveniles to have religious beliefs. These results, which are similar to those reported by Freeman (1986) suggest a causal mechanism from religion to juvenile criminal behavior.

If the mother attended, but did not graduate from college, this increases the probability of selling drugs in comparison to cases where the mother has a college degree. The presence of two parents in the family decreases the probability of selling drugs by 3 percent in comparison to single or no parent families. The coefficient of the variable measuring family poverty is positive but statistically insignificant.

The characteristics of the neighborhood also have an impact on the behavior of the juveniles. Per capita local welfare spending in the county has a positive impact on the propensity to sell drugs. If increased poverty, represented by high welfare spending, is associated with a reduced demand for drugs because of a negative income effect, the

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corresponding reduction in price and transaction in drugs may reduce the producer surplus in the market. Under this scenario, a hard-core, professional drug seller may leave the market, creating room for the entry of juvenile sellers.

The unemployment rate is positive and significant, suggesting that living in areas with few employment opportunities encourages male juveniles to earn illegal incomes by selling drugs. The population density of the county has a negative effect on selling drugs, indicating that, all else equal, living in the low density areas increases the propensity to sell drugs for juveniles. The proportion of Hispanics in the county negatively impacts the propensity to sell drugs, and the probability goes up with the proportion of population who voted for Ross Perot and Democratic in 1992 presidential elections.

Per capita police spending and the arrest rate for property crimes in the county have no impact on the decision to sell drugs, but as predicted by economic model of crime, an increase in the arrest rate for violent crimes in the county decreases the probability of selling drugs for juveniles. Specifically, an additional arrest per violent crime reduces the probability of selling drugs for juvenile males by 4 percent.


*Assault*

Table 7B presents the estimated probit models for assault for juvenile males. The only race effect is for blacks: black male adolescents have almost 4 percent higher probability of assaulting someone, keeping constant personal, family, and county characteristics, and deterrence measures. The coefficients of AGE14 is positive and statistically significant, while the coefficients of AGE15, AGE16 and AGE17 are not different from zero. This suggests that the propensity to assault for juvenile males peaks at age 14. Being a Born-Again Christian lowers the probability of committing assault by 3.7 percent, while being a Catholic lowers it by 3.1 percent.

Mother's education has no impact on the offspring's propensity to assault, but adolescent males are 8 percent more likely to assault if their father has only a high school education, and 5 percent more likely to assault if the father attended, but not finished college. Children from two-parent families have 4 percent lower probability to assault, all else being the same.

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Poverty in the county is positively related to the likelihood to commit assault, which is consistent with the finding of Corman and Mocan (forthcoming), who report a positive relationship between poverty and murders in New York City. Table 7B also presents additional evidence to support the deterrence hypothesis. An additional arrest per violent crime is associated with a reduction in the probability of assault for juvenile males by 6 percent.

*Robbery*

Table 7C presents the results for robbery. Black male juveniles have 1.5 percent higher probability to commit robbery than whites. There are no statistical differences between estimated age coefficients. This suggests that 14-to-17 year olds are more likely to commit robbery than younger children, but otherwise there are no significant differences by age. Coming from a two-parent family has no impact on committing robbery, but if a parent receives public assistance the juvenile's propensity to commit robbery is 2.5 percent higher.

Unemployment and poverty in the county have positive impacts, demonstrating the importance of economic conditions. For example, a one percentage point increase in the unemployment rate is associated with a three percent increase in the probability of committing a robbery. However, the results from this regression provide no evidence of a deterrence effect. The estimated coefficients of the arrest and police spending variables are neither individually, nor jointly significant. These results suggest that family and neighborhood poverty are better predictors of the propensity to committing robbery than deterrence variables.

*Burglary*

Table 7D presents the results for burglary. Native American male juveniles and juveniles belonging to the "other race" category have a higher propensity to burglarize. As was the case for robbery, the hypothesis of the equality of the age coefficients cannot be rejected. Having no religious beliefs increases the probability to commit burglary by 4 percent. County characteristics, including unemployment and poverty have no impact

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on burglary, but family poverty has a positive impact: if the family is on welfare, this increases the child's propensity to commit burglary by 3 percent. Arrest rates and police force do not have an impact on burglaries committed by male juveniles.

*Theft*

Table 7E displays the results for theft. All else equal, Native Americans have a higher propensity to commit theft. Adolescents who are 14 years of age are more likely to steal in comparison to younger ones, and adolescents who are 15-17 are more likely to steal in comparison to 14 year olds. Having no religious beliefs increases the propensity to steal by 4 percent. If the family is on welfare, the probability to steal is 4 percent higher.

Although the deterrence variables are lagged, their potential endogeneity cannot be ruled out. Following Tauchen, Witte and Griesinger (1994) we tested the endogeneity of per capita police spending and arrest rates. Using the Rivers and Vuong test (1988), we instrumented our deterrence measures with county government spending on education and health, and state spending on education, health, and welfare. In the first stage regressions the five instruments were jointly extremely significant (p= 0.000), and in no case could we reject the null hypothesis of the exogeneity of the deterrence variables.

All the models were also estimated for females. The results revealed interesting differences between male and female juvenile criminal behavior. Table A2 in the appendix summarizes the results for females. In contrast to the male results, the propensity to sell drugs is lower for black female juveniles as compared to white females. Parental education has a more pronounced impact on female delinquency than was the case for males. Similarly, local area characteristics such as population density, proportion of population in rural areas and proportion Hispanic are more important determinants of female criminal activity. There is also a difference in the age-crime relationship. With the exception of selling drugs, female juvenile criminal activity peaks before age 17 for females. Violent crime arrests deter theft and drug sales of females.

Finally, we estimated ordered probit models for both genders. As reported in

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Table 2, criminal activity is classified into four different  frequency categories for each
offense: zero offenses, one to two offenses, three to four offenses, and five or more
offenses.  The results of these ordered probits are consistent with the participation
regression results, and the results for males are presented in the Appendix.

### V.  Summary and Simulations

Table 8 summarizes the results reported in Tables 7A-7E for selected variables.
Some of the county characteristics and variables that were consistently statistically
insignificant are not included.  The variables in the upper section of Table 8 can be
thought of as non-policy variables. They are race, age and religion of the juvenile male.
It is not clear why race is a determinant of criminal activity after controlling for a host of
personal, family and neighborhood characteristics. It is possible that race is capturing
some effect not measured by the variables in the model.  For example, although all of the
individuals in our sample are enrolled in high school, it is possible that the quality of
education is correlated with race.

The variables in the lower section of Table 8 can be manipulated by policy
makers.  Among them are parental education, family structure, family poverty,
unemployment and poverty in the county of residence, and the arrest rate for violent
crimes in the county.  Selling drugs and assaults are sensitive to increases in violent crime
arrests.  Family poverty, measured by family welfare status has a positive impact on
juveniles' involvement in robbery, burglary, and theft.  County poverty, measured by per
capita local welfare spending, has a positive impact on selling drugs, assault, and
robbery.  Local unemployment affects the selling of drugs and robbery.

The presence of two parents in the family lowers juvenile males' participation in
assault and selling drugs, perhaps a reflection of parental supervision.  Glaeser, Sacerdote
and Scheinkman (1996) explore the influence of social interactions on crime.  They find
higher levels of social interactions in cities with more female-headed households, and
suggest that social interactions among criminals are higher if the family units are not
intact.  Our results can also be seen as providing support for the social interaction
hypothesis.  Specifically, the negative relationship between two-parent households and

juvenile crime may be due to closer supervision of children in these households.

The effects summarized in Table 8 are often substantial in magnitude. Moving from a one- or no-parent household to a two-parent household reduces the probability of selling drugs by 2.7 percent and the probability of assault by 3.8 percent (Table 9). If the family leaves the welfare rolls, this reduces the propensity to commit property crimes for the juvenile male. More precisely, the probability to commit robbery, burglary and theft goes down by 2.5 percent, 3 percent, and 4.4 percent, respectively. As Table 9 demonstrates, a two percentage point decrease in the unemployment rate lowers the probability of selling drugs by 0.8 percent, and the probability of committing robbery by 0.6 percent. A 50 percent increase in the arrest rate for violent crimes reduces the probability of selling drugs by 1.1 percent, and the probability of assault by 1.4 percent.

A natural question to ask is how consistent these results are with recent trends in juvenile crime. Time-series data on juvenile crime are not available. Following Levitt (1998), juvenile crime can be imputed by using the Uniform Crime Reports of the FBI and the National Crime Victimization Survey data. Using the algorithm described earlier, we calculated that in 1989 there were a total of 4.7 million crimes committed by juveniles. This is the sum of juvenile robberies, assaults, burglaries and thefts. Total juvenile crime increased to 7.8 million by 1993: an increase of 3.1 million offenses. During the same time period the arrest rates and police spending increased as well. However, these increases are potentially endogenous; they may have been determined by increases in crime rate. On the other hand, there were two changes during the same period which can be considered exogenous. The aggregate unemployment rate increased by 1.4 percentage points (from 5.5 percent to 6.9 percent) and the AFDC caseload also increased during the same period (U.S. House Committee on Ways and Means 1998). (Specifically, the number of AFDC children increased by 1 million between 1988 and 1993). Using these numbers and the estimated parameters presented in the paper, a rough calculation indicates that the increase in unemployment and family poverty can explain approximately 14 percent of the increase in juvenile crime between 1989 and 1993. By 1996, the unemployment rate went down to 5.4 percent, and the number of children in poverty decreased by 1.1 million. The total number of juvenile crimes went

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down to 7.2 million offenses. The decline in unemployment and poverty explain 28 percent of the decrease in juvenile crime during this period.

VI. Conclusion

This is the first paper to test the economic model of crime for juveniles using micro data. It uses a nationally representative sample of 16,478 high school children surveyed in 1995. The data set allows for a portrayal of the extent of juvenile crime, as well as an investigation of race and gender differences in criminal behavior and the impacts of economic and deterrence variables.

In 1994 approximately 7 million juveniles (one-quarter of adolescents in 11-17 age group) were involved in at least one type of criminal act. One million and two hundred thousand juveniles sold drugs, 3.3 million assaulted someone, 725,000 juveniles committed robbery, 866,000 committed burglary and 860,000 stole something worth more than $50, and they committed a total of 16.5 million offenses in 1994. There are substantial differences between races in crime commission rates. For example, 46 percent of Native American juvenile males committed at least one crime, while the rates are 40 percent for black males, 35 percent for white males, 31 percent for Asian males. Almost one out of five Native American males sold drugs. The corresponding rates are approximately one-in-ten for blacks and whites, and one-in-fifteen for Asian males. The crime commission rates of females are roughly half that of males.

We find that juveniles respond to incentives as predicted by economic theory. An increase in violent crime arrests reduces the probability of selling drugs and assaulting someone for males, and reduces the probability of selling drugs and stealing for females. An increase in local unemployment increases the propensity to commit crimes, as does local poverty. Similarly, family poverty increases the probability to commit robbery, burglary and theft for males, and assault and burglary for females. Local characteristics are more important for females than males.

Racial differences persist even after controlling for personal and family characteristics and deterrence measures. For example, all else equal, in comparison to whites, black male juveniles are more likely to sell drugs, commit robbery, and commit

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assault.  It is not clear why racial differences exist after controlling for personal, family, county characteristics, the unemployment rate and deterrence measures.  One explanation is that race may act as a proxy for unobservable neighborhood or school characteristics.

Education of the parents has a more pronounced impact on female juvenile criminal activity than that of males.  This is especially true for mother's education, where the daughters of college educated mothers have lower propensity to sell drugs, assault, rob or steal.  Religious beliefs impact the propensity to commit crime as does the family structure.  Male juveniles who come from two-parent families are less likely to assault and sell drugs, while juvenile females from two-parent families are less likely to sell drugs, assault and rob, which suggests that family supervision has an impact on delinquent behavior.

Simulations show that the increase in unemployment and family poverty can explain approximately 14 percent of the increase in juvenile crime between 1989 and 1993, and the decline in the unemployment rate and the number of children in poverty explain 28 percent of the decrease in juvenile crime between 1993 and 1996.

These results, taken together, show that the notion of "new breed of young predators who do not respond to incentives" does not have empirical support.  Juveniles *do* respond to incentives and sanctions. Employment opportunities, increased family income and more strict deterrence are effective tools to reduce juvenile crime.

**Table 1**
**Descriptive Statistics**

| Variable | | Definition |
|---|---|---|
| From: *National Longitudinal Study of Adolescent Health* | | |
| Female | 0.51 (0.50) | Dichotomous variable equal to 1 if female, 0 if male. |
| Age 14 | 0.16 (0.37) | Dichotomous variable equal to 1 if respondent was 14 years of age at the time of the interview, equal to 0 otherwise. |
| Age 15 | 0.21 (0.41) | Dichotomous variable equal to 1 if respondent was 15 years of age at the time of the interview, equal to 0 otherwise. |
| Age 16 | 0.24 (0.42) | Dichotomous variable equal to 1 if the respondent was 16 years of age at the time of the interview, equal to 0 otherwise. |
| Age 17 | 0.23 (0.42) | Dichotomous variable equal to 1 if respondent was 17 years of age at the time of the interview, equal to 0 otherwise. |
| Hispanic | 0.17 (0.37) | Dichotomous variable equal to 1 if the respondent said they were of Hispanic or Latino origin, equal to 0 otherwise. |
| Black | 0.24 (0.43) | Dichotomous variable equal to 1 if the respondent said they were black or African American, equal to zero otherwise. |
| Asian | 0.07 (0.25) | Dichotomous variable equal to 1 if the respondent said they were Asian or Pacific Islander, equal to 0 otherwise. |
| Native American | 0.02 (0.13) | Dichotomous variable equal to 1 if the respondent said they were Native American or American Indian, equal to 0 otherwise. |
| Other Race | 0.09 (0.28) | Dichotomous variable equal to 1 if the respondent said they belonged to an unspecified "other" race, equal to 0 otherwise. |
| Father-No High School | 0.10 (0.30) | Dichotomous variable equal to 1 if resident father did not graduate from high school, equal to 0 otherwise. |
| Father-High School Grad. | 0.21 (0.41) | Dichotomous variable equal to 1 if resident father graduated from high school or received a GED, equal to 0 otherwise. |

| | | |
|---|---|---|
| Father-Some College | 0.12 (0.32) | Dichotomous variable equal to 1 if the resident father attended college but did not graduate, equal to 0 otherwise. |
| Father-College Grad. | 0.22 (0.41) | Dichotomous variable equal to 1 if the resident father graduated from college, equal to 0 otherwise. |
| Father-Education Missing | 0.35 (0.48) | Dichotomous variable equal to 1 if there was no resident father or if respondent did know father's schooling, otherwise equal to 0. |
| Mother-No High School | 0.14 (0.35) | Dichotomous variable equal to 1 if resident mother did not graduate from high school, equal to 0 otherwise. |
| Mother-High School Grad. | 0.32 (0.47) | Dichotomous variable equal to 1 if resident mother graduated from high school or received a GED, equal to 0 otherwise. |
| Mother-Some College | 0.18 (0.39) | Dichotomous variable equal to 1 if the resident mother attended college but did not graduate, equal to 0 otherwise. |
| Mother-College Graduate | 0.26 (0.44) | Dichotomous variable equal to 1 if the resident mother graduated from college, equal to 0 otherwise. |
| Mother-Education Missing | 0.10 (0.30) | Dichotomous variable equal to 1 if there was no resident mother or if respondent did know mother's schooling, otherwise equal to 0. |
| Two Parent Family | 0.66 (0.47) | Dichotomous variable equal to 1 if respondent lived with two parents, equal to 0 otherwise. |
| Parent on Welfare | 0.12 (0.32) | Dichotomous variable equal to 1 if either resident parent received public assistance, and equal to 0 otherwise. |
| Born Again Christian | 0.26 (0.44) | Dichotomous variable equal to 1 if respondents said they were Born Again Christian, and equal to 0 otherwise. |
| Catholic | 0.26 (0.44) | Dichotomous variable equal to 1 if respondents said they were Catholic, and equal to 0 otherwise. |
| No Religion | 0.12 (0.32) | Dichotomous variable equal to 1 if respondents said they had no religious beliefs, and equal to 0 otherwise. |
| Baptist | 0.22 (0.41) | Dichotomous variable equal to 1 if respondent said they were Baptist, and equal to 0 otherwise. |

| From: *1990 Census of Population and Housing* | | |
|---|---|---|
| County Unemployment | 0.07 (0.02) | Percent unemployed of the civilian labor force in the county of residence. |
| % County Rural | 0.23 (0.27) | Proportion of the county population living in a rural area. |
| % County Urban | 0.66 (0.39) | Proportion of the county population living in an urban area. |
| County Population Density | 0.58 (1.53) | Persons per square kilometer in the county of residence. |
| % County Pop. Black | 0.15 (0.14) | Proportion of the county population black. |
| % County Prop. Hispanic | 0.10 (0.14) | Proportion of the county population Hispanic. |
| From: *USA Counties (Bureau of the Census, 1994)* | | |
| Per Capita Police Spending | 90.55 (45.18) | Per capita local government direct general expenditures on police protection in the county of residence, 1987. |
| Per Capita Welfare Spending | 77.61 (103.77) | Per capita local government direct general expenditures on public welfare in the county of residence, 1987. |
| % Democrat | 0.44 (0.10) | Proportion voting Democratic in the 1992 presidential elections in the county of residence. |
| % Ross Perot | 0.18 (0.06) | Proportion voting for Perot in the 1992 presidential elections in the county of residence. |
| From: *Uniform Crime Reports (FBI, 1994)* | | |
| County Crime Rate | 5998.48 (2859.49) | The number crimes in the county per 100,000 persons. |
| Arrests per Violent Crime | 0.46 (0.29) | Total violent crime arrests divided by the number of violent crimes in the county of residence, 1993. |
| Arrests per Property Crime | 0.19 (0.09) | Total property crime arrests divided by the number of property crimes in the county of residence, 1993. |
| n = 16,478 | | |

**Table 2**
**Descriptive Statistics for Juvenile Offenses**

| Variable | Definition | Mean | Std. Dev. |
|---|---|---|---|
| | In the past 12 months did you . . . | | |
| Sold Drugs | sell marijuana or other drugs? | 0.073 | 0.261 |
| Sold Drugs_12 | . . . 1 or 2 times | 0.037 | 0.189 |
| Sold Drugs_34 | . . . 3 or 4 times | 0.011 | 0.103 |
| Sold Drugs_5+ | . . . 5 or more times | 0.026 | 0.158 |
| Assault | hurt someone badly enough to need bandages or care from a doctor or nurse? | 0.194 | 0.396 |
| Assault_12 | . . . 1 or 2 times | 0.148 | 0.355 |
| Assault_34 | . . . 3 or 4 times | 0.024 | 0.154 |
| Assault_5+ | . . . 5 or more times | 0.022 | 0.147 |
| Robbery | use or threaten to use a weapon to get something from someone? | 0.044 | 0.205 |
| Robbery_12 | . . . 1 or 2 times | 0.032 | 0.177 |
| Robbery_34 | . . . 3 or 4 times | 0.006 | 0.079 |
| Robbery_5+ | . . . 5 or more times | 0.006 | 0.074 |
| Burglary | go into a house to steal something? | 0.054 | 0.227 |
| Burglary_12 | . . . 1 or 2 times | 0.038 | 0.192 |
| Burglary_34 | . . . 3 or 4 times | 0.007 | 0.083 |
| Burglary_5+ | . . . 5 or more times | 0.009 | 0.094 |
| Theft | steal something worth more than $50? | 0.056 | 0.231 |
| Theft_12 | . . . 1 or 2 times | 0.038 | 0.191 |
| Theft_34 | . . . 3 or 4 times | 0.008 | 0.091 |
| Theft_5+ | . . . 5 or more times | 0.010 | 0.100 |

## Table 3

### Proportion of Juveniles Who Committed
### at Least One Crime

|                 | Male  | Female |
|-----------------|-------|--------|
| All races       | 0.361 | 0.190  |
| White           | 0.348 | 0.169  |
| Black           | 0.401 | 0.229  |
| Native American | 0.463 | 0.295  |
| Asian           | 0.310 | 0.146  |
| Other           | 0.381 | 0.252  |

### Juvenile Crime Commission Rates

| Crimes             | Males | Females |
|--------------------|-------|---------|
| None               | 0.639 | 0.810   |
| One type of Crime  | 0.235 | 0.138   |
| 2 Different Crimes | 0.071 | 0.034   |
| 3 Different Crimes | 0.030 | 0.012   |
| 4 Different Crimes | 0.014 | 0.005   |
| 5 Different Crimes | 0.011 | 0.002   |

**Table 4**
**Juvenile Crime Commission Rates by Type of Offense**

Selling Drugs

|  | Male | Female |
|---|---|---|
| All races | 0.1008 | 0.0477 |
| Native American | 0.1912 | 0.0671 |
| Black | 0.1096 | 0.0350 |
| Hispanic | 0.1300 | 0.0589 |
| Asian | 0.0663 | 0.0295 |
| White | 0.0942 | 0.0525 |
| Other | 0.1364 | 0.0603 |

Robbery

|  | Male | Female |
|---|---|---|
| All races | 0.0599 | 0.0290 |
| Native American | 0.0882 | 0.0800 |
| Black | 0.0771 | 0.0392 |
| Hispanic | 0.0659 | 0.0359 |
| Asian | 0.0448 | 0.0203 |
| White | 0.0524 | 0.0223 |
| Other | 0.0770 | 0.0445 |

Assault

|  | Male | Female |
|---|---|---|
| All races | 0.2710 | 0.1211 |
| Native American | 0.3456 | 0.2267 |
| Black | 0.3101 | 0.1716 |
| Hispanic | 0.2893 | 0.1419 |
| Asian | 0.2268 | 0.0775 |
| White | 0.2575 | 0.0977 |
| Other | 0.2903 | 0.1564 |

**Table 4 (concluded)**

Theft

|  | Male | Female |
|---|---|---|
| All races | 0.0752 | 0.0384 |
| Native American | 0.1397 | 0.0733 |
| Black | 0.0733 | 0.0269 |
| Hispanic | 0.0890 | 0.0603 |
| Asian | 0.0663 | 0.0517 |
| White | 0.0719 | 0.0370 |
| Other | 0.0979 | 0.0661 |

Burglary

|  | Male | Female |
|---|---|---|
| All races | 0.0753 | 0.0342 |
| Native American | 0.1250 | 0.0467 |
| Black | 0.0728 | 0.0255 |
| Hispanic | 0.0768 | 0.0402 |
| Asian | 0.0630 | 0.0295 |
| White | 0.0733 | 0.0368 |
| Other | 0.0968 | 0.0417 |

**Table 5**
**Juvenile Crime by Family Structure and Poverty**

| Two Parent Household | Number of Different Crimes (Selling Drugs+ Assault+ Robbery+ Burglary+ Theft) | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5+ |
| No | 67.3 | 21.1 | 6.6 | 2.9 | 1.4 | 0.8 |
| Yes | 75.3 | 17.2 | 4.6 | 1.7 | 0.7 | 0.6 |

| Two Parent Household | Selling Drugs | Assault | Robbery | Burglary | Theft |
|---|---|---|---|---|---|
| No | 9.5 | 23.6 | 5.7 | 6.6 | 7.1 |
| Yes | 6.3 | 17.4 | 3.7 | 4.9 | 4.9 |

| Parent(s) on Welfare | Number of Different Crimes (Selling Drugs+ Assault+ Robbery+ Burglary+ Theft) | | | | | |
|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5+ |
| No | 73.6 | 18.0 | 5.0 | 1.9 | 0.9 * | 0.6 |
| Yes | 65.5 | 22.1 | 6.8 | 3.5 | 1.0 * | 1.1 |

| Parent(s) on Welfare | Selling Drugs | Assault | Robbery | Burglary | Theft |
|---|---|---|---|---|---|
| No | 7.2 | 18.6 | 4.2 | 5.2 | 5.3 |
| Yes | 8.4 | 25.3 | 6.3 | 7.5 | 8.3 |

* indicates that the rates are not statistically different from each other.

**Table 6**
**Juvenile Criminal Activity**

| Offense | (I) Juvenile Crime Rate in Our data (weighted) | (II) Juvenile Crime Rate NYS 1976 (Ploeger 1997) | (III) Number of Juvenile Participants | (IV) Number of Offenses Committed by Juveniles | (V) Imputed Number of Juvenile Offenses from Official Sources |
|---|---|---|---|---|---|
| Selling Drugs | 0.070 | 0.104 | 1,210,000 | 3,748,000 | -- |
| Assault | 0.190 | 0.042, 0.330 * | 3,278,000 | 7,033,000 | 1,488,000 |
| Robbery | 0.042 | -- | 725,000 | 1,680,000 | 411,501 |
| Burglary | 0.050 | 0.024 | 866,000 | 2,057,000 | 2,106,000 |
| Theft | 0.050 | 0.026 | 860,000 | 2,049,000 | 3,891,000 |

\* The entries in this cell represent the offense rates for "attacking someone," and "hitting students," respectively.

**Table 7A**
**The Determinants of Selling Drugs—Juvenile Males**

| Variable | Marginal Effect | Std. Err. |
|---|---|---|
| Black | 0.01839** | (0.00977) |
| Asian | -0.03157*** | (0.00884) |
| Native American | 0.10180*** | (0.03635) |
| Other Race | 0.01810 | (0.01252) |
| Hispanic | 0.02605** | (0.01261) |
| Age14 | 0.09702*** | (0.02051) |
| Age15 | 0.13029*** | (0.02063) |
| Age16 | 0.15750*** | (0.01799) |
| Age17 | 0.17712*** | (0.02011) |
| Born Again Christian | -0.02981*** | (0.00762) |
| Catholic | -0.00927 | (0.00896) |
| Baptist | -0.00289 | (0.01005) |
| No Religion | 0.02843*** | (0.01130) |
| Father-No High School | 0.00845 | (0.01528) |
| Father-High School Grad. | 0.00235 | (0.01105) |
| Father-Some College | 0.01787 | (0.01611) |
| Mother-No High School | 0.00555 | (0.01310) |
| Mother-High School Grad. | 0.00789 | (0.00956) |
| Mother-Some College | 0.02555** | (0.01267) |
| Father-Education Missing | 0.01016 | (0.01419) |
| Mother-Education Missing | 0.02167* | (0.01224) |
| Two Parent Family | -0.02709** | (0.01292) |
| Parent on Welfare | 0.00852 | (0.00914) |
| County Unemployment | 0.35624* | (0.19126) |
| Per Capita Welfare Spending | 0.00011* | (0.00006) |
| County Population Density | -0.01014*** | (0.00257) |
| % County Rural | -0.06481 | (0.04192) |
| % County Urban | -0.01772 | (0.02930) |
| % County Pop. Black | -0.08390 | (0.05267) |
| % County Pop. Hispanic | -0.15917*** | (0.04453) |
| % Ross Perot | 0.22794** | (0.09691) |
| % Democrat | 0.14380*** | (0.04685) |
| County Crime Rate | 0.0000001 | (0.000002) |
| Per Capita Police Spending | 0.00015 | (0.00021) |
| Arrests Per Property Crime | 0.06246 | (0.05799) |
| Arrests Per Violent Crime | -0.04229** | (0.01679) |
| n = 8026 | | |
| Log Likelihood = -2466.37 | | |

The standard errors are Huber corrected. * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

## Table 7B
## The Determinants of Assault—Juvenile Males

| Variable | Marginal Effect | Std. Err. |
|---|---|---|
| Black | 0.03702** | (0.01790) |
| Asian | -0.01893 | (0.02745) |
| Native American | 0.06494 | (0.04340) |
| Other Race | 0.00391 | (0.01870) |
| Hispanic | 0.01158 | (0.01968) |
| Age14 | 0.03476* | (0.02155) |
| Age15 | 0.02951 | (0.02017) |
| Age16 | 0.02473 | (0.01725) |
| Age17 | 0.01290 | (0.01578) |
| Born Again Christian | -0.03667** | (0.01432) |
| Catholic | -0.03135* | (0.01830) |
| Baptist | -0.00304 | (0.01384) |
| No Religion | 0.01971 | (0.01891) |
| Father-No High School | 0.03350 | (0.02603) |
| Father-High School Grad. | 0.07768*** | (0.01892) |
| Father-Some College | 0.04902** | (0.02138) |
| Mother-No High School | 0.02355 | (0.02396) |
| Mother-High School Grad. | 0.01095 | (0.01781) |
| Mother-Some College | 0.00786 | (0.01540) |
| Father-Education Missing | 0.06205*** | (0.02101) |
| Mother-Education Missing | 0.00655 | (0.02608) |
| Two Parent Family | -0.03843** | (0.01741) |
| Parent on Welfare | 0.02432 | (0.01674) |
| County Unemployment | 0.31657 | (0.28663) |
| Per Capita Welfare Spending | 0.00020** | (0.00010) |
| County Population Density | -0.00192 | (0.00386) |
| % County Rural | 0.04521 | (0.06638) |
| % County Urban | 0.04919 | (0.03784) |
| % County Pop. Black | 0.09828 | (0.07018) |
| % County Pop. Hispanic | 0.00079 | (0.06097) |
| % Ross Perot | 0.33295** | (0.13256) |
| % Democrat | -0.09326 | (0.07282) |
| County Crime Rate | -0.000006 | (0.000003) |
| Per Capita Police Spending | 0.00005 | (0.00030) |
| Arrests Per Property Crime | -0.03700 | (0.09170) |
| Arrests Per Violent Crime | -0.06265* | (0.03312) |
| n = 8031 | | |
| Log Likelihood = -4617.04 | | |

The standard errors are Huber corrected. * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

### Table 7C
### The Determinants of Robbery—Juvenile Males

| Variable | Marginal Effect | Std. Err. |
|---|---|---|
| Black | 0.01500** | (0.00758) |
| Asian | -0.00555 | (0.00943) |
| Native American | 0.03325 | (0.02619) |
| Other Race | 0.01883 | (0.01364) |
| Hispanic | -0.00233 | (0.00861) |
| Age14 | 0.02968** | (0.01356) |
| Age15 | 0.03353*** | (0.01158) |
| Age16 | 0.04174*** | (0.01164) |
| Age17 | 0.03030*** | (0.01189) |
| Born Again Christian | -0.00589 | (0.00639) |
| Catholic | -0.01462** | (0.00643) |
| Baptist | -0.00782 | (0.00744) |
| No Religion | 0.01074 | (0.00871) |
| Father-No High School | 0.00823 | (0.01273) |
| Father-High School Grad. | -0.000004 | (0.00725) |
| Father-Some College | 0.01314 | (0.01005) |
| Mother-No High School | 0.01168 | (0.01202) |
| Mother-High School Grad. | -0.00057 | (0.00712) |
| Mother-Some College | -0.00555 | (0.00764) |
| Father-Education Missing | 0.02154** | (0.00975) |
| Mother-Education Missing | 0.01341 | (0.00980) |
| Two Parent Family | 0.00024 | (0.00866) |
| Parent on Welfare | 0.02512*** | (0.00879) |
| County Unemployment | 0.28533** | (0.13106) |
| Per Capita Welfare Spending | 0.00010** | (0.00004) |
| County Population Density | -0.00357** | (0.00154) |
| % County Rural | -0.03658 | (0.02405) |
| % County Urban | 0.00830 | (0.01545) |
| % County Pop. Black | 0.01161 | (0.03249) |
| % County Pop. Hispanic | -0.04935* | (0.03034) |
| % Ross Perot | -0.00278 | (0.06742) |
| % Democrat | -0.02659 | (0.03678) |
| County Crime Rate | -0.000001 | (0.000002) |
| Per Capita Police Spending | -0.00011 | (0.00018) |
| Arrests Per Property Crime | -0.00349 | (0.03951) |
| Arrests Per Violent Crime | -0.00616 | (0.01721) |
| n = 8041 | | |
| Log Likelihood = -1778.09 | | |

The standard errors are Huber corrected. * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

**Table 7D**
**The Determinants of Burglary—Juvenile Males**

| Variable | Marginal Effect | Std. Err. |
|---|---|---|
| Black | 0.00322 | (0.01007) |
| Asian | -0.00864 | (0.01006) |
| Native American | 0.04560* | (0.03164) |
| Other Race | 0.03628*** | (0.01507) |
| Hispanic | -0.01709* | (0.00906) |
| Age14 | 0.02752*** | (0.01091) |
| Age15 | 0.03773*** | (0.01284) |
| Age16 | 0.03452*** | (0.01022) |
| Age17 | 0.02141** | (0.01037) |
| Born Again Christian | 0.00153 | (0.00738) |
| Catholic | 0.00278 | (0.00808) |
| Baptist | -0.00449 | (0.00848) |
| No Religion | 0.03723*** | (0.01151) |
| Father-No High School | 0.00028 | (0.01376) |
| Father-High School Grad. | 0.00684 | (0.00949) |
| Father-Some College | -0.00274 | (0.01089) |
| Mother-No High School | -0.00773 | (0.01010) |
| Mother-High School Grad. | -0.00515 | (0.00860) |
| Mother-Some College | -0.01228 | (0.00894) |
| Father-Education Missing | 0.02464** | (0.01100) |
| Mother-Education Missing | 0.01831* | (0.01011) |
| Two Parent Family | -0.00284 | (0.00854) |
| Parent on Welfare | 0.03054*** | (0.01114) |
| County Unemployment | -0.02519 | (0.18942) |
| Per Capita Welfare Spending | 0.00005 | (0.00007) |
| County Population Density | -0.00136 | (0.00250) |
| % County Rural | -0.04753 | (0.03384) |
| % County Urban | -0.00193 | (0.02108) |
| % County Pop. Black | -0.03844 | (0.04655) |
| % County Pop. Hispanic | 0.01929 | (0.05871) |
| % Ross Perot | -0.00773 | (0.07892) |
| % Democrat | -0.03303 | (0.05111) |
| County Crime Rate | -0.0000007 | (0.000003) |
| Per Capita Police Spending | -0.00024 | (0.00019) |
| Arrests Per Property Crime | 0.06343 | (0.04672) |
| Arrests Per Violent Crime | 0.00185 | (0.01644) |
| n = 8039 | | |
| Log Likelihood = -2118.96 | | |

The standard errors are Huber corrected. * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

**Table 7E**
**The Determinants of Theft—Juvenile Males**

| Variable | Marginal Effect | Std. Err. |
|---|---|---|
| Black | 0.00123 | (0.00805) |
| Asian | -0.01363 | (0.01095) |
| Native American | 0.04388* | (0.02915) |
| Other Race | 0.01885 | (0.01404) |
| Hispanic | -0.01540 | (0.00967) |
| Age14 | 0.02832** | (0.01246) |
| Age15 | 0.05187*** | (0.01152) |
| Age16 | 0.05149*** | (0.01110) |
| Age17 | 0.05348*** | (0.01296) |
| Born Again Christian | -0.00373 | (0.00742) |
| Catholic | -0.00058 | (0.00718) |
| Baptist | -0.01313 | (0.00776) |
| No Religion | 0.03853*** | (0.01324) |
| Father-No High School | -0.01096 | (0.01105) |
| Father-High School Grad. | 0.00334 | (0.00953) |
| Father-Some College | 0.00867 | (0.00852) |
| Mother-No High School | 0.01644 | (0.01209) |
| Mother-High School Grad. | 0.01355* | (0.00742) |
| Mother-Some College | 0.00789 | (0.00911) |
| Father-Education Missing | 0.01684* | (0.00980) |
| Mother-Education Missing | 0.04364*** | (0.01482) |
| Two Parent Family | -0.00770 | (0.00862) |
| Parent on Welfare | 0.04381*** | (0.00951) |
| County Unemployment | 0.02270 | (0.16824) |
| Per Capita Welfare Spending | 0.00005 | (0.00004) |
| County Population Density | -0.00255 | (0.00162) |
| % County Rural | -0.06739** | (0.03002) |
| % County Urban | -0.01734 | (0.01749) |
| % County Pop. Black | -0.03875 | (0.04111) |
| % County Pop. Hispanic | 0.01724 | (0.02437) |
| % Ross Perot | -0.00307 | (0.06340) |
| % Democrat | -0.05479 | (0.03929) |
| County Crime Rate | -0.00000005 | (0.000002) |
| Per Capita Police Spending | 0.00001 | (0.00015) |
| Arrests Per Property Crime | 0.07028 | (0.04449) |
| Arrests Per Violent Crime | -0.01782 | (0.01738) |
| n = 8043 | | |
| Log Likelihood = -2081.80 | | |

The standard errors are Huber corrected. * indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

**Table 8**
**Summary Results for Juvenile Males**

| | Selling Drugs | Assault | Robbery | Burglary | Theft |
|---|---|---|---|---|---|
| Variable | | | | | |
| Black | + | + | + | | |
| Native American | + | | | + | + |
| Asian | -- | | | | |
| Other | | | | + | |
| Hispanic | + | | | | |
| Age 14 | + | + | + | + | + |
| Age 15 | + | + | + | + | + |
| Age 16 | + | + | + | + | + |
| Age 17 | + | + | + | + | + |
| Born Again Christian | -- | -- | | | |
| Catholic | | -- | -- | | |
| No Religion | + | | | + | + |
| Father High school | | + | | | |
| Father some College | | + | | | |
| Mother High school | | | | | + |
| Mother some College | + | | | | |
| Two Parent Family | -- | -- | | | |
| Parent on Welfare | | | + | + | + |
| County Unemployment | + | | + | | |
| Per Capital Welfare Spending | + | + | + | | |
| Arrests Per Violent Crime | -- | -- | | | |

**Table 9**
**The Impact of Selected Determinants on Juvenile Offenses**

|  |  | Selling Drugs | Assault | Robbery | Burglary | Theft |
|---|---|---|---|---|---|---|
| Two Parent (67%) | A Switch To Two-Parent Family | -2.7% | -3.8% |  |  |  |
| Parent on Welfare (12%) | Family Out of Welfare |  |  | -2.5% | -3.0% | -4.4% |
| Unemployment (6.8%) | A Two Percentage Point Decline in Unemployment Rate | -0.8% |  | -0.6% |  |  |
| Violent Arrest Rate (46%) | A 50% Increase in Arrest Rate | -1.1% | -1.4% |  |  |  |

The numbers in parentheses in the first column are sample means for the corresponding variable.

# Appendix

## Table A1
## Probit Estimates—No Religious Beliefs

| Variable | Marginal Effect | Std. Err. |
|---|---|---|
| Black | -0.00833 | (0.01091) |
| Asian | 0.02083 | (0.01634) |
| Native American | 0.10057*** | (0.03804) |
| Other | -0.02181 | (0.01505) |
| Hispanic | -0.03704*** | (0.01219) |
| Age14 | 0.03858*** | (0.01517) |
| Age15 | 0.03933*** | (0.01401) |
| Age16 | 0.04500*** | (0.01367) |
| Age17 | 0.04672*** | (0.01390) |
| Father-No High School | 0.01392 | (0.01678) |
| Father-High School Grad. | 0.01915 | (0.01255) |
| Father-Some College | 0.00734 | (0.01399) |
| Mother-No High school | 0.05915*** | (0.01699) |
| Mother-High School Grad. | 0.02565** | (0.01099) |
| Mother-Some College | 0.00252 | (0.01224) |
| Father-Education Missing | 0.03703** | (0.01517) |
| Mother-Education Missing | 0.06727*** | (0.01666) |
| Two Parent Family | -0.01910 | (0.01265) |
| Parent on Welfare | 0.05512*** | (0.01371) |
| County Unemployment | -0.00355 | (0.20485) |
| Per Capita Welfare Spending | -0.00013*** | (0.00005) |
| County Population Density | 0.00318 | (0.00376) |
| % County Rural | -0.01498 | (0.03732) |
| % County Urban | 0.00223 | (0.02439) |
| % County Pop. Black | -0.25921*** | (0.04433) |
| % County Pop. Hispanic | -0.04935 | (0.03939) |
| % County Ross Perot | 0.32406*** | (0.08850) |
| % County Democrat | 0.14030*** | (0.04894) |
| n = 8407 | | |
| Log Likelihood = -3129.31 | | |

* indicates significance at the 10% level, ** indicates significance at the 5% level.
*** indicates significance at the 1% level.

**Table A2**
**Summary Results for Juvenile Females**

| | Selling Drugs | Assault | Robbery | Burglary | Theft |
|---|---|---|---|---|---|
| Variable | Female | Female | Female | Female | Female |
| Black | -- | + | | | |
| Native American | | + | + | | |
| Asian | -- | | | | |
| Other Race | | + | + | | |
| Hispanic | | | + | | |
| Age14 | + | | | + | + |
| Age15 | + | | | | + |
| Age16 | + | -- | -- | | + |
| Age17 | + | -- | | -- | |
| Born Again Christian | -- | | -- | | |
| Baptist | | | | -- | |
| Catholic | | | | | |
| No Religion | | + | + | | + |
| Father-No High School | | | | | |
| Father-High School Grad. | | + | + | | |
| Father-Some College | | | | | |
| Mother-No High School | | + | | | |
| Mother-High School Grad. | + | + | + | | + |
| Mother-Some College | + | + | | | |
| Two Parent Family | -- | -- | -- | | |
| Parent on Welfare | | + | | + | |
| County Unemployment | | + | | | |
| County Population Density | -- | -- | -- | -- | -- |
| % County Rural | -- | | -- | -- | |
| % County Urban | | | | | |
| % County Pop. Black | | | | | -- |
| % County Pop. Hispanic | -- | -- | -- | | |
| % Ross Perot | | | | + | |
| % Democrat | + | | | | |
| County Crime Rate | -- | | | | |
| Per Capita Welfare Spending | | + | + | | + |
| Per Capita Police Spending | | | | | |
| Arrests Per Violent Crime | -- | | | | -- |
| Arrests Per Property Crime | | | | | |

## Table A3
## The Determinants of Selling Drugs—Juvenile Males
## (Ordered Probit)

| Variable | Coefficient | Marginal Effects For . . . | | | |
|---|---|---|---|---|---|
| | | Selling Drugs 0 times | Selling Drugs 1 or 2 times | Selling Drugs 3 or 4 times | Selling Drugs 5 or more times |
| Constant | -2.49577*** | 0.3912 | -0.1601 | -0.0602 | -0.1709 |
| | (0.27701) | | | | |
| Black | 0.11740* | -0.0184 | 0.0075 | 0.0028 | 0.0080 |
| | (0.06159) | | | | |
| Asian | -0.22366** | 0.0351 | -0.0143 | -0.0054 | -0.0153 |
| | (0.09626) | | | | |
| Native American | 0.45851*** | -0.0719 | 0.0294 | 0.0111 | 0.0314 |
| | (0.14496) | | | | |
| Other Race | 0.11445 | -0.0179 | 0.0073 | 0.0028 | 0.0078 |
| | (0.08121) | | | | |
| Hispanic | 0.15294** | -0.0240 | 0.0098 | 0.0037 | 0.0105 |
| | (0.07197) | | | | |
| Age14 | 0.48490*** | -0.0760 | 0.0311 | 0.0117 | 0.0332 |
| | (0.09577) | | | | |
| Age15 | 0.65234*** | -0.1022 | 0.0418 | 0.0157 | 0.0447 |
| | (0.09043) | | | | |
| Age16 | 0.77192*** | -0.1210 | 0.0495 | 0.0186 | 0.0529 |
| | (0.08702) | | | | |
| Age17 | 0.85167*** | -0.1335 | 0.0546 | 0.0205 | 0.0583 |
| | (0.08704) | | | | |
| Born Again Christian | -0.19641*** | 0.0308 | -0.0126 | -0.0047 | -0.0135 |
| | (0.05627) | | | | |
| Catholic | -0.04749 | 0.0074 | -0.0030 | -0.0011 | -0.0033 |
| | (0.05602) | | | | |
| Baptist | -0.02077 | 0.0033 | -0.0013 | -0.0005 | -0.0014 |
| | (0.06012) | | | | |
| No Religion | 0.19160*** | -0.0300 | 0.0123 | 0.0046 | 0.0131 |
| | (0.06023) | | | | |
| Father-No High School | 0.06331 | -0.0099 | 0.0041 | 0.0015 | 0.0043 |
| | (0.08636) | | | | |
| Father-High School Grad. | 0.03461 | -0.0054 | 0.0022 | 0.0008 | 0.0024 |
| | (0.06554) | | | | |
| Father-Some College | 0.10802 | -0.0169 | 0.0069 | 0.0026 | 0.0074 |
| | (0.07320) | | | | |
| Mother-No High School | 0.02801 | -0.0044 | 0.0018 | 0.0007 | 0.0019 |
| | (0.07569) | | | | |

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**Table A3 (Concluded)**

| | | | | | |
|---|---|---|---|---|---|
| Mother-High School Grad. | 0.04604 (0.05728) | -0.0072 | 0.0030 | 0.0011 | 0.0032 |
| Mother-Some College | 0.14426** (0.06307) | -0.0226 | 0.0093 | 0.0035 | 0.0099 |
| Father-Education Missing | 0.04621 (0.08180) | -0.0072 | 0.0030 | 0.0011 | 0.0032 |
| Mother-Education Missing | 0.12611* (0.07328) | -0.0198 | 0.0081 | 0.0030 | 0.0086 |
| Two Parent Family | -0.17856** (0.06939) | 0.0280 | -0.0115 | -0.0043 | -0.0122 |
| Parent on Welfare | 0.05139 (0.06240) | -0.0081 | 0.0033 | 0.0012 | 0.0035 |
| County Unemployment | 2.19963* (1.20062) | -0.3448 | 0.1411 | 0.0530 | 0.1507 |
| Per Capita Welfare Spending | 0.00076** (0.00032) | -0.0001 | 0 | 0 | 0.0001 |
| County Population Density | -0.06372*** (0.01969) | 0.0100 | -0.0041 | -0.0015 | -0.0044 |
| % County Rural | -0.42538* (0.25232) | 0.0667 | -0.0273 | -0.0103 | -0.0291 |
| % County Urban | -0.10038 (0.15879) | 0.0157 | -0.0064 | -0.0024 | -0.0069 |
| % County Pop. Black | -0.52061* (0.29742) | 0.0816 | -0.0334 | -0.0125 | -0.0357 |
| % County Pop. Hispanic | -1.00010*** (0.24186) | 0.1568 | -0.0641 | -0.0241 | -0.0685 |
| % Ross Perot | 1.57530*** (0.51886) | -0.2469 | 0.1010 | 0.0380 | 0.1079 |
| % Democrat | 0.95654*** (0.29534) | -0.1499 | 0.0614 | 0.0231 | 0.0655 |
| County Crime Rate | 0.000002 (0.00001) | 0 | 0 | 0 | 0 |
| Per Capita Police Spending | 0.00057 (0.00112) | -0.0001 | 0 | 0 | 0 |
| Arrests Per Property Crime | 0.38452 (0.36521) | -0.0603 | 0.0247 | 0.0093 | 0.0263 |
| Arrests Per Violent Crime | -0.28142** (0.11353) | 0.0441 | -0.0181 | -0.0068 | -0.0193 |

n = 8026

Log Likelihood = -3285.65

\* indicates significance at the 10% level, ** indicates significance at the 5% level,
\*\*\* indicates significance at the 1% level.

**Table A4**
**The Determinants of Committing Assault—Juvenile Males**
**(Ordered Probit)**

| Variable | Coefficient | Marginal Effects For . . . | | | |
|---|---|---|---|---|---|
| | | Commit Assault 0 times | Commit Assault 1 or 2 times | Commit Assault 3 or 4 times | Commit Assault 5 or more times |
| Constant | -1.05128*** | 0.3464 | -0.2048 | -0.0623 | -0.0792 |
| | (0.19969) | | | | |
| Black | 0.11161** | -0.0368 | 0.0217 | 0.0066 | 0.0084 |
| | (0.04414) | | | | |
| Asian | -0.04888 | 0.0161 | -0.0095 | -0.0029 | -0.0037 |
| | (0.06456) | | | | |
| Native American | 0.20248* | -0.0667 | 0.0394 | 0.0120 | 0.0153 |
| | (0.10955) | | | | |
| Other Race | 0.02454 | -0.0081 | 0.0048 | 0.0015 | 0.0018 |
| | (0.06404) | | | | |
| Hispanic | 0.04632 | -0.0153 | 0.0090 | 0.0027 | 0.0035 |
| | (0.05680) | | | | |
| Age14 | 0.08798* | -0.0290 | 0.0171 | 0.0052 | 0.0066 |
| | (0.05289) | | | | |
| Age15 | 0.09634** | -0.0317 | 0.0188 | 0.0057 | 0.0073 |
| | (0.04893) | | | | |
| Age16 | 0.08016* | -0.0264 | 0.0156 | 0.0048 | 0.0060 |
| | (0.04772) | | | | |
| Age17 | 0.05188 | -0.0171 | 0.0101 | 0.0031 | 0.0039 |
| | (0.04852) | | | | |
| Born Again Christian | -0.08152** | 0.0269 | -0.0159 | -0.0048 | -0.0061 |
| | (0.03967) | | | | |
| Catholic | -0.07204* | 0.0237 | -0.0140 | -0.0043 | -0.0054 |
| | (0.04119) | | | | |
| Baptist | -0.00295 | 0.0010 | -0.0006 | -0.0002 | -0.0002 |
| | (0.04282) | | | | |
| No Religion | 0.11746** | -0.0387 | 0.0229 | 0.0070 | 0.0089 |
| | (0.04623) | | | | |
| Father-No High School | 0.12521** | -0.0413 | 0.0244 | 0.0074 | 0.0094 |
| | (0.06331) | | | | |
| Father-High School Grad. | 0.23292*** | -0.0767 | 0.0454 | 0.0138 | 0.0176 |
| | (0.04879) | | | | |
| Father-Some College | 0.15002*** | -0.0494 | 0.0292 | 0.0089 | 0.0113 |
| | (0.05443) | | | | |
| Mother-No High School | 0.06193 | -0.0204 | 0.0121 | 0.0037 | 0.0047 |
| | (0.05596) | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mother-High School Grad. | 0.02710 (0.04250) | -0.0089 | 0.0053 | 0.0016 | 0.0020 |
| Mother-Some College | 0.01895 (0.04783) | -0.0062 | 0.0037 | 0.0011 | 0.0014 |
| Father-Education Missing | 0.18967*** (0.05746) | -0.0625 | 0.0369 | 0.0112 | 0.0143 |
| Mother-Education Missing | 0.08008 (0.05344) | -0.0264 | 0.0156 | 0.0047 | 0.0060 |
| Two Parent Family | -0.10973** (0.04975) | 0.0362 | -0.0214 | -0.0065 | -0.0083 |
| Parent on Welfare | 0.08806* (0.04604) | -0.0290 | 0.0172 | 0.0052 | 0.0066 |
| County Unemployment | 1.08939 (0.88136) | -0.3589 | 0.2122 | 0.0646 | 0.0821 |
| Per Capita Welfare Spending | 0.00062*** (0.00022) | -0.0002 | 0.0001 | 0 | 0 |
| County Population Density | -0.00704 (0.01317) | 0.0023 | -0.0014 | -0.0004 | -0.0005 |
| % County Rural | 0.11712 (0.16134) | -0.0386 | 0.0228 | 0.0069 | 0.0088 |
| % County Urban | 0.14283 (0.10854) | -0.0471 | 0.0278 | 0.0085 | 0.0108 |
| % County Pop. Black | 0.32605 (0.21065) | -0.1074 | 0.0635 | 0.0193 | 0.0246 |
| % County Pop. Hispanic | -0.13846 (0.17684) | 0.0456 | -0.0270 | -0.0082 | -0.0104 |
| % Ross Perot | 1.07915*** (0.37659) | -0.3555 | 0.2102 | 0.0640 | 0.0813 |
| % Democrat | -0.25071 (0.21968) | 0.0826 | -0.0488 | -0.0149 | -0.0189 |
| County Crime Rate | -0.00001 (0.00001) | 0 | 0 | 0 | 0 |
| Per Capita Police Spending | 0.00061 (0.00084) | -0.0002 | 0.0001 | 0 | 0 |
| Arrests Per Property Crime | -0.01725 (0.25203) | 0.0057 | -0.0034 | -0.0010 | -0.0013 |
| Arrests Per Violent Crime | -0.18430** (0.08238) | 0.0607 | -0.0359 | -0.0109 | -0.0139 |

n = 8031
Log Likelihood = -6296.16

* indicates significance at the 10% level, ** indicates significance at the 5% level, *** indicates significance at the 1% level.

**Table A5**
**The Determinants of Committing Robbery—Juvenile Males**
**(Ordered Probit)**

| Variable | Coefficient | Marginal Effects For . . . | | | |
|---|---|---|---|---|---|
| | | Commit Robbery 0 times | Commit Robbery 1 or 2 times | Commit Robbery 3 or 4 times | Commit Robbery 5 or more times |
| Constant | -1.81665*** | 0.2031 | -0.1345 | -0.0316 | -0.0370 |
| | (0.33338) | | | | |
| Black | 0.14388** | -0.0161 | 0.0107 | 0.0025 | 0.0029 |
| | (0.06788) | | | | |
| Asian | -0.04722 | 0.0053 | -0.0035 | -0.0008 | -0.0010 |
| | (0.10988) | | | | |
| Native American | 0.29391* | -0.0329 | 0.0218 | 0.0051 | 0.0060 |
| | (0.15871) | | | | |
| Other Race | 0.13575 | -0.0152 | 0.0101 | 0.0024 | 0.0028 |
| | (0.09645) | | | | |
| Hispanic | 0.00237 | -0.0003 | 0.0002 | 0 | 0 |
| | (0.09054) | | | | |
| Age14 | 0.23549*** | -0.0263 | 0.0174 | 0.0041 | 0.0048 |
| | (0.08907) | | | | |
| Age15 | 0.25115*** | -0.0281 | 0.0186 | 0.0044 | 0.0051 |
| | (0.08429) | | | | |
| Age16 | 0.31404*** | -0.0351 | 0.0233 | 0.0055 | 0.0064 |
| | (0.08082) | | | | |
| Age17 | 0.23648*** | -0.0264 | 0.0175 | 0.0041 | 0.0048 |
| | (0.08367) | | | | |
| Born Again Christian | -0.07547 | 0.0084 | -0.0056 | -0.0013 | -0.0015 |
| | (0.06327) | | | | |
| Catholic | -0.13695** | 0.0153 | -0.0101 | -0.0024 | -0.0028 |
| | (0.06697) | | | | |
| Baptist | -0.05432 | 0.0061 | -0.0040 | -0.0009 | -0.0011 |
| | (0.06702) | | | | |
| No Religion | 0.10214 | -0.0114 | 0.0076 | 0.0018 | 0.0021 |
| | (0.07237) | | | | |
| Father-No High School | 0.08402 | -0.0094 | 0.0062 | 0.0015 | 0.0017 |
| | (0.10106) | | | | |
| Father-High School Grad. | -0.00244 | 0.0003 | -0.0002 | 0 | 0 |
| | (0.08079) | | | | |
| Father-Some College | 0.11317 | -0.0127 | 0.0084 | 0.0020 | 0.0023 |
| | (0.08795) | | | | |
| Mother-No High School | 0.08865 | -0.0099 | 0.0066 | 0.0015 | 0.0018 |
| | (0.08401) | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mother-High School Grad. | -0.00470 (0.06718) | 0.0005 | -0.0003 | -0.0001 | -0.0001 |
| Mother-Some College | -0.06287 (0.07849) | 0.0070 | -0.0047 | -0.0011 | -0.0013 |
| Father-Education Missing | 0.17570* (0.09171) | -0.0196 | 0.0130 | 0.0031 | 0.0036 |
| Mother-Education Missing | 0.12057 (0.08393) | -0.0135 | 0.0089 | 0.0021 | 0.0025 |
| Two Parent Family | -0.00184 (0.07702) | 0.0002 | -0.0001 | 0 | 0 |
| Parent on Welfare | 0.21822*** (0.06627) | -0.0244 | 0.0162 | 0.0038 | 0.0044 |
| County Unemployment | 2.37942* (1.39485) | -0.2661 | 0.1762 | 0.0414 | 0.0485 |
| Per Capita Welfare Spending | 0.00084** (0.00035) | -0.0001 | 0.0001 | 0 | 0 |
| County Population Density | -0.02800 (0.02059) | 0.0031 | -0.0021 | -0.0005 | -0.0006 |
| % County Rural | -0.32608 (0.25635) | 0.0365 | -0.0241 | -0.0057 | -0.0066 |
| % County Urban | 0.09398 (0.17406) | -0.0105 | 0.0070 | 0.0016 | 0.0019 |
| % County Pop. Black | 0.07668 (0.32476) | -0.0086 | 0.0057 | 0.0013 | 0.0016 |
| % County Pop. Hispanic | -0.46450* (0.26404) | 0.0519 | -0.0344 | -0.0081 | -0.0095 |
| % Ross Perot | 0.04674 (0.62878) | -0.0052 | 0.0035 | 0.0008 | 0.0010 |
| % Democrat | -0.19414 (0.36266) | 0.0217 | -0.0144 | -0.0034 | -0.0040 |
| County Crime Rate | -0.00001 (0.00002) | 0 | 0 | 0 | 0 |
| Per Capita Police Spending | -0.00116 (0.00132) | 0.0001 | -0.0001 | 0 | 0 |
| Arrests Per Property Crime | -0.08657 (0.41205) | 0.0097 | -0.0064 | -0.0015 | -0.0018 |
| Arrests Per Violent Crime | -0.04698 (0.13169) | 0.0053 | -0.0035 | -0.0008 | -0.0010 |

n = 8041

Log Likelihood = -2161.43

* indicates significance at the 10% level, ** indicates significance at the 5% level,
*** indicates significance at the 1% level.

## Table A6
## The Determinants of Committing Burglary—Juvenile Males
## (Ordered Probit)

| Variable | Coefficient | Marginal Effects For . . . | | | |
| --- | --- | --- | --- | --- | --- |
| | | Commit Burglary 0 times | Commit Burglary 1 or 2 times | Commit Burglary 3 or 4 times | Commit Burglary 5 or more times |
| Constant | -1.45647*** | 0.1999 | -0.1273 | -0.0294 | -0.0433 |
| | (0.28836) | | | | |
| Black | 0.03661 | -0.0050 | 0.0032 | 0.0007 | 0.0011 |
| | (0.06285) | | | | |
| Asian | -0.05594 | 0.0077 | -0.0049 | -0.0011 | -0.0017 |
| | (0.09598) | | | | |
| Native American | 0.26616* | -0.0365 | 0.0233 | 0.0054 | 0.0079 |
| | (0.15445) | | | | |
| Other Race | 0.21833** | -0.0300 | 0.0191 | 0.0044 | 0.0065 |
| | (0.09343) | | | | |
| Hispanic | -0.13259 | 0.0182 | -0.0116 | -0.0027 | -0.0039 |
| | (0.08304) | | | | |
| Age14 | 0.17035** | -0.0234 | 0.0149 | 0.0034 | 0.0051 |
| | (0.08027) | | | | |
| Age15 | 0.23583*** | -0.0324 | 0.0206 | 0.0048 | 0.0070 |
| | (0.07594) | | | | |
| Age16 | 0.22467*** | -0.0308 | 0.0196 | 0.0045 | 0.0067 |
| | (0.07258) | | | | |
| Age17 | 0.14245* | -0.0196 | 0.0124 | 0.0029 | 0.0042 |
| | (0.07474) | | | | |
| Born Again Christian | 0.01160 | -0.0016 | 0.0010 | 0.0002 | 0.0003 |
| | (0.05852) | | | | |
| Catholic | 0.02867 | -0.0039 | 0.0025 | 0.0006 | 0.0009 |
| | (0.06010) | | | | |
| Baptist | -0.03311 | 0.0045 | -0.0029 | -0.0007 | -0.0010 |
| | (0.06225) | | | | |
| No Religion | 0.24318*** | -0.0334 | 0.0212 | 0.0049 | 0.0072 |
| | (0.06569) | | | | |
| Father-No High School | 0.00763 | -0.0010 | 0.0007 | 0.0002 | 0.0002 |
| | (0.09596) | | | | |
| Father-High School Grad. | 0.05375 | -0.0074 | 0.0047 | 0.0011 | 0.0016 |
| | (0.06921) | | | | |
| Father-Some College | -0.01492 | 0.0020 | -0.0013 | -0.0003 | -0.0004 |
| | (0.07985) | | | | |
| Mother-No High School | -0.05394 | 0.0074 | -0.0047 | -0.0011 | -0.0016 |
| | (0.08144) | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| Mother-High School Grad. | -0.04214 (0.06028) | 0.0058 | -0.0037 | -0.0008 | -0.0013 |
| Mother-Some College | -0.09436 (0.07067) | 0.0130 | -0.0082 | -0.0019 | -0.0028 |
| Father-Education Missing | 0.16743** (0.08255) | -0.0230 | 0.0146 | 0.0034 | 0.0050 |
| Mother-Education Missing | 0.14423* (0.07500) | -0.0198 | 0.0126 | 0.0029 | 0.0043 |
| Two Parent Family | -0.01942 (0.07011) | 0.0027 | -0.0017 | -0.0004 | -0.0006 |
| Parent on Welfare | 0.19416*** (0.06582) | -0.0266 | 0.0170 | 0.0039 | 0.0058 |
| County Unemployment | -0.03600 (1.29731) | 0.0049 | -0.0031 | -0.0007 | -0.0011 |
| Per Capita Welfare Spending | 0.00032 (0.00036) | 0 | 0 | 0 | 0 |
| County Population Density | -0.01107 (0.02318) | 0.0015 | -0.0010 | -0.0002 | -0.0003 |
| % County Rural | -0.32180 (0.24686) | 0.0442 | -0.0281 | -0.0065 | -0.0096 |
| % County Urban | 0.03704 (0.16106) | -0.0051 | 0.0032 | 0.0007 | 0.0011 |
| % County Pop. Black | -0.30343 (0.31063) | 0.0416 | -0.0265 | -0.0061 | -0.0090 |
| % County Pop. Hispanic | 0.11159 (0.27763) | -0.0153 | 0.0098 | 0.0022 | 0.0033 |
| % Ross Perot | -0.03526 (0.55388) | 0.0048 | -0.0031 | -0.0007 | -0.0010 |
| % Democrat | -0.18990 (0.31826) | 0.2610 | -0.0166 | -0.0038 | -0.0056 |
| County Crime Rate | -0.000003 (0.00001) | 0 | 0 | 0 | 0 |
| Per Capita Police Spending | -0.00198 (0.00123) | 0.0003 | -0.0002 | 0 | -0.0001 |
| Arrests Per Property Crime | 0.40449 (0.35193) | -0.0555 | 0.0353 | 0.0082 | 0.0120 |
| Arrests Per Violent Crime | 0.03198 (0.10947) | -0.0044 | 0.0028 | 0.0006 | 0.0010 |

n = 8039

Log Likelihood = -2624.25

\* indicates significance at the 10% level, \*\* indicates significance at the 5% level,
\*\*\* indicates significance at the 1% level.

**Table A7**
**The Determinants of Committing Theft—Juvenile Males**
**(Ordered Probit)**

| Variable | Coefficient | Marginal Effects For . . . | | | |
|---|---|---|---|---|---|
| | | Commit Theft 0 times | Commit Theft 1 or 2 times | Commit Theft 3 or 4 times | Commit Theft 5 or more times |
| Constant | -1.58292*** | 0.2093 | -0.1260 | -0.0334 | -0.0499 |
| | (0.29958) | | | | |
| Black | 0.03181 | -0.0042 | 0.0025 | 0.0007 | 0.0010 |
| | (0.06557) | | | | |
| Asian | -0.10642 | 0.0141 | -0.0085 | -0.0022 | -0.0034 |
| | (0.09730) | | | | |
| Native American | 0.29239* | -0.0387 | 0.0233 | 0.0062 | 0.0092 |
| | (0.15055) | | | | |
| Other Race | 0.13048 | -0.0173 | 0.0104 | 0.0028 | 0.0041 |
| | (0.08916) | | | | |
| Hispanic | -0.12063 | 0.0160 | -0.0096 | -0.0025 | -0.0038 |
| | (0.08468) | | | | |
| Age14 | 0.19604** | -0.0259 | 0.0156 | 0.0041 | 0.0062 |
| | (0.08881) | | | | |
| Age15 | 0.34942*** | -0.0462 | 0.0278 | 0.0074 | 0.0110 |
| | (0.08001) | | | | |
| Age16 | 0.34411*** | -0.0455 | 0.0274 | 0.0073 | 0.0109 |
| | (0.07879) | | | | |
| Age17 | 0.36470*** | -0.0482 | 0.0290 | 0.0077 | 0.0115 |
| | (0.07971) | | | | |
| Born Again Christian | -0.01498 | 0.0020 | -0.0012 | -0.0003 | -0.0005 |
| | (0.06095) | | | | |
| Catholic | 0.00631 | -0.0008 | 0.0005 | 0.0001 | 0.0002 |
| | (0.06003) | | | | |
| Baptist | -0.09177 | 0.0121 | -0.0073 | -0.0019 | -0.0029 |
| | (0.06683) | | | | |
| No Religion | 0.26646*** | -0.0352 | 0.0212 | 0.0056 | 0.0084 |
| | (0.06524) | | | | |
| Father-No High School | -0.08484 | 0.0112 | -0.0068 | -0.0018 | -0.0027 |
| | (0.09774) | | | | |
| Father-High School Grad. | 0.03224 | -0.0043 | 0.0026 | 0.0007 | 0.0010 |
| | (0.07022) | | | | |
| Father-Some College | 0.05813 | -0.0077 | 0.0046 | 0.0012 | 0.0018 |
| | (0.07888) | | | | |
| Mother-No High School | 0.13592* | -0.0180 | 0.0108 | 0.0029 | 0.0043 |
| | (0.07960) | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mother-High School Grad. | 0.08516 (0.06228) | -0.0113 | 0.0068 | 0.0018 | 0.0027 |
| Mother-Some College | 0.04670 (0.07181) | -0.0062 | 0.0037 | 0.0010 | 0.0015 |
| Father-Education Missing | 0.10526 (0.08667) | -0.0139 | 0.0084 | 0.0022 | 0.0033 |
| Mother-Education Missing | 0.27928*** (0.07636) | -0.0369 | 0.0222 | 0.0059 | 0.0088 |
| Two Parent Family | -0.07224 (0.07492) | 0.0096 | -0.0057 | -0.0015 | -0.0023 |
| Parent on Welfare | 0.28083*** (0.06198) | -0.0371 | 0.0223 | 0.0059 | 0.0089 |
| County Unemployment | 0.42621 (1.31611) | -0.0564 | 0.0339 | 0.0090 | 0.0134 |
| Per Capita Welfare Spending | 0.00029 (0.00034) | 0 | 0 | 0 | 0 |
| County Population Density | -0.02152 (0.02175) | 0.0028 | -0.0017 | -0.0005 | -0.0007 |
| % County Rural | -0.55248** (0.24955) | 0.0731 | -0.0440 | -0.0117 | -0.0174 |
| % County Urban | -0.10553 (0.16439) | 0.0140 | -0.0084 | -0.0022 | -0.0033 |
| % County Pop. Black | -0.34072 (0.33262) | 0.0451 | -0.0271 | -0.0072 | -0.0107 |
| % County Pop. Hispanic | 0.14583 (0.25649) | -0.0193 | 0.0116 | 0.0031 | 0.0046 |
| % Ross Perot | 0.02523 (0.56397) | -0.0033 | 0.0020 | 0.0005 | 0.0008 |
| % Democrat | -0.30470 (0.32573) | 0.0403 | -0.0242 | -0.0064 | -0.0096 |
| County Crime Rate | 0.000002 (0.00001) | 0 | 0 | 0 | 0 |
| Per Capita Police Spending | -0.00035 (0.00130) | 0 | 0 | 0 | 0 |
| Arrests Per Property Crime | 0.45276 (0.38461) | -0.0599 | 0.0360 | 0.0096 | 0.0143 |
| Arrests Per Violent Crime | -0.07578 (0.12682) | 0.0100 | -0.0060 | -0.0016 | -0.0024 |

n = 8043

Log Likelihood = -2619.54

* indicates significance at the 10% level, ** indicates significance at the 5% level,
*** indicates significance at the 1% level.

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