Determinants of Crime Among American Youth, Evidence from Micro Panel Data

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Abstract

I investigate factors that are associated with young individuals engaging in criminal activity. Making full use of the National Longitudinal Survey of Youth 1997, I look at two key different types of criminal activity: that motivated primarily by economic gain, and that motivated more by psychological gain. I show that the typical profile of individuals engaging in illicit activity varies by the classification of the criminal act. I employ both cross sectional and fixed effects regression strategies to determine which factors affect criminal behavior. Being a male, and being involved in a gang significantly increase the probability youth will engage in criminal activity. As well there is no substantial evidence that exogenous increases in income will reduce crime rates. I further find evidence that being employed, or being enrolled in school can lead to increases in criminal activity, the latter result being the focus of Jacob and Lefgren (2003). There are some potential avenues for reducing criminal involvement - increasing high school completion, and there is weak evidence that getting "tougher" on crime may reduce certain types of criminal activity.

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I Introduction

When observing crime over the life-cycle in the United States, a clear pattern emerges with respect to youth. Youth begin to cause crime in early adolescence at an increasing rate, peaking in the late teens and then declining sharply throughout the early twenties. This trend is well documented, see for example, Levitt and Lochner (2001).

Juvenile crime is becoming an increasing concern in the United States. Levitt (1998) notes that the rate at which juveniles were arrested for violent crime rose 79 percent between 1978 and 1993, almost three times the increase over that period for adults. More recently, in 2006 many states have reported rising rates of juvenile involvement in criminal activity.[1] Becker (1968)'s seminal model of crime was the first to provide solid theoretical underpinnings to criminal behavior observed empirically. He claimed that crime could be understood from an economic framework of the costs and benefits associated with an individual's decision to engage in criminal activity: "Some persons become 'criminals,' therefore, not because their basic motivation differs from that of other persons, but because their benefits and costs differ."

More recent analysis examining the determinants of crime has been examined in numerous studies of economic nature, for a detailed summary of this literature see Wilson and Petersilia (1995). Of more relevance, Levitt and Lochner (2001) summarize in their discussion of the determinants of juvenile crime four key areas that contain important factors which are linked to criminal activity. They are biological, social, criminal justice, and economic. A clear pattern emerges in almost all empirical data regarding criminal activity by gender and age. Males are much more likely to commit crimes and violent acts.[2] In addition to this division by gender, the observed pattern of criminal activity by

[1] $http://www.usatoday.com/news/nation/2006-07-12-juveniles-cover_x.htm.$

[2] See Wilson and Herrnstein (1985)

age may suggest some relationship between propensity to engage in criminal acts and biology. However the precise link between biology and criminal activity is murky at best, and further encroachment on this topic touches on the nature vs. nurture debate, which is far beyond the scope of this paper. Wilson and Herrnstein (1985) also note that low intelligence and high discount rates are associated with higher levels of criminal activity. Again how much of this can be explained by biology rather than other factors such as societal influence is not the focus of this paper.

Being intertwined with biological factors, societal influence nonetheless plays a definitive role in the determinants of criminal activity. Levitt and Lochner (2001) note that a primary factor is the quality of parenting, and cite previous work which linked legalized abortion with lower crime rates.[3] Previous economic research has firmly established the link between unstable or broken homes and criminal involvement later in life.[4] Programs that target children early in life have proved to have a positive effect in reducing later criminal activity, see for example Donohue and Siegelman (1996).

In Becker (1968) punishment is an integral part of the model of criminal behavior. The criminal justice system influences an individual's cost of committing crime, such that more severe punishment should deter crime. As expected, increases in the level of policing, as well as increases in prison sentences have been shown to reduce overall levels of crime.[5] Levitt (1998) demonstrated that youths respond in a similar way to adults with respect to changes in punishment, and additionally finds that the transition from being tried as a juvenile to being tried as an adult is associated with a significant decrease in criminal activity.

[3] They suggest that crime is 10-15% lower as a consequence of legalized abortion. There is some dispute regarding this claim however, see Foote and Goetz (2008).

[4] See Dagg (1991).

[5] See for example Corman and Mocan (2000) and Marvell and Moody (1994) respectively.

Lastly, economic factors play a role in the determinants of crime. Better prospects in the labor market increase the opportunity cost of engaging in criminal activities such as the possibility of facing jail time. As well, increased attachment to the labor market can explain part of the observed crime-age trend discussed above, as demonstrated by Bound and Freeman (1992). It has been reported that criminal activity is inversely related to family income, however the issue is not as clear cut as intuition may tell us. For example, Levitt and Lochner (2001) find that family income has no effect on violent or property based crime. The results in this paper also challenge the conventional belief that income plays a significant role in engagement in criminal activity.

This paper will re-evaluate the relative merits of these four factors for explaining criminal activity, by making use of the National Longitudinal Survey of Youth (NLSY) that began in 1997 (henceforth NLSY 1997), organized by the Bureau of Labor Statistics. The NLSY 1997 is a micro level panel data set at the individual level, that follows approximately 9000 youths from the age of 13 through 17 in 1997 to the present time.[6] Given the availability of this comprehensive data set, it is surprising that the use of micro data for analyzing the determinants of juvenile crime has been relatively rare. Viscusi (1986) utilized a data set of inner-city black males in three American cities in 1979.[7] He showed that individuals not in school, or not employed were more strongly motivated by economic incentives to commit crime. Tauchen, Witte and Griesinger (1994) analyzed a small study of 567 young men born in Philadelphia in 1945, and found that increases in the police budget were associated with fewer arrests during the year.

Both of these papers are valuable for their analysis of the particular groups they study, however as the survey's used were not nationally representative,

[6] As of writing this paper the last published year was 2006.
[7] The number of individuals totalled 2358; in Boston, Chicago, and Philadelphia.

the external validity may be questionable. Additionally, their empirical analysis relies primarily on cross sectional regression techniques, as opposed to using a fixed effects methodology, the former being potentially problematic in the case of unobserved heterogeneity across individuals. A more nationally representative, extensive survey, was the NLSY 1980, the precursor to the NLSY 1997 utilized in this paper. A few economics papers have taken advantage of this survey. Grogger (1998) used the NLSY 1980 survey to investigate the factors which lead to criminal activity in young males. He determined that a decline in the real wage was associated with statistically significant increases in the propensity to engage in criminal activity. Additionally he found that much of the observed age trend of criminal activity, and racial differential can be explained through labor market outcomes. Levitt and Lochner (2001) also make use of the NLSY 1980, focussing on youth aged 15-19. Among the determinants of crime they examine, they find that gender and family background characteristics are key determinants of criminal behavior in youth. One potential issue with these two studies, and with the NLSY 1980 for studies on criminal activity is that the supplement to the survey that deals with crime is only available for one year, so there is no opportunity to conduct longitudinal analysis.

Mocan and Rees (2005) make use of another micro level data set, the National Longitudinal Study of Adolescent Health (NLSAH). The study has the advantage of having annual questions on criminal involvement, and containing over 20,000 observations of American youth. However it lacks critical variables pertaining to demographics, family back ground, and ability measures. Despite these differences with the NLSY 1980, the results of the empirical study in Mocan and Rees (2005) are broadly comparable with those in Levitt and Lochner (2001).

II Data

Due to the limitations of both the NLSY 1980 and the NLSAH studies, this paper improves on these studies by using the more recent NLSY 1997. The newer 1997 data maintains the extensive demographic and family background variables found in the earlier iteration, however it also contains a number of key improvements highly relevant to examining determinants of juvenile crime. The first improvement is that there is a section in the survey dedicated to monitoring criminal involvement on an annual basis, unlike the 1980 survey which only included this information in one year. The NLSY 1997 criminal activity section contains detailed self-reported responses to questions which inquire about offenses that were carried out by the individual, with information about the type of offense, and whether the individual was arrested and/or charged. The survey asks each individual to report every relevant criminal incident from birth until the present survey date. When applicable, the survey also contains information on the monetary value of the particular crime committed.[8] A second advantage of the NLSY 1997 data is that it contains a continuous proxy of every individual's perception of the probability of being punished for an offense. Previous studies have generally had to rely on aggregate measures, such as state-level arrest records and jail time to determine the deterrent effect of criminal sanctions.[9]

The NLSY 1997 contains data on 8,984 young individuals in the United States, with the youngest cohort being those that were 13 years old in 1997, and the oldest being 17.[10] Figure 1 shows a basic plot of the proportion of youth arrested to total youth in the sample at a particular age. The overall trend shows

[8]For example, for theft over $50, the survey asks the value of the item(s) stolen if they were to be sold(hypothetically or not).

[9]One paper that does make use of this proxy of an individual's perception of punishment is Lochner (2007).

[10]Each age-cohort contains roughly one-fifth of the total number of individuals. They range from a minimum of 1,691 at age 17, to 1,874 at age 16.

a clear sharp rise in crimes committed until the age of 19, followed by a steady decline that continues until the end of the sample is reached. Figure 2 plots the same relationship, by gender. It is clear that the trend observed in Figure 1 was driven almost entirely by the pattern of male criminal behavior. The proportion of males to females arrested at a given age exceeds 3 for youth aged between 17 and 24. This gender-crime pattern is well documented, having been observed in a number of studies, see for example in Levitt and Lochner (2001). In addition to the potential for a biological link behind the observed crime-gender relationship, we can observe the race-crime relationship, shown in Figure 3. Comparing only blacks and whites, blacks are arrested proportionally more than whites at each age level. The underlying crime-age pattern is very similar between both races, achieving a peak of arrests around the age of 19, and declining thereafter.[11] In the appendix, Figures 4 through 6 demonstrate an identical pattern looking at the absolute number of arrests by age, rather than looking at which individuals were arrested at a given age.

In addition to data on arrests, the NLSY also contains self-reported information on illicit activities which individuals may have participated in, regardless of whether such activities resulted in an arrest. This information is invaluable, and an advantage over previous studies which have had to rely on arrest data, because formal arrests are only a proxy for criminal activity. The data on criminal activity reported by individuals was classified into six different categories. The first is minor theft, formed from the question, "Have you ever stolen something from a store or something that did not belong to you worth less than 50 dollars?". Similarly major theft was determined from the question, "Have you ever stolen something from a store, person or house, or something that did not belong to you worth 50 dollars or more including stealing a car?". A mea-

[11] For the very last age observed in the sample, 26, the pattern diverges. However the number of observations in this age-cohort represents less than 2% of the sample, so little weight should be placed on this deviation.

sure of assault is formed from, "Have you attacked someone with the idea of seriously hurting them or have had a situation end up in a serious fight or assault of some kind?". Data was also collected on instances where individuals sold drugs, "Have you ever sold or helped sell marijuana (pot, grass), hashish (hash) or other hard drugs such as heroin, cocaine or LSD?", including further classification of whether the drugs were in the former category (marijuana) or the latter. Finally there included a section on property crimes, divided into destroying property: "Have you ever purposely damaged or destroyed property that did not belong to you?", and 'other property crimes': "Have you ever committed other property crimes such as fencing, receiving, possessing or selling stolen property, or cheated someone by selling them something that was worthless or worth much less than what you said it was?".

In addition to an indicator of whether each of the above six types of crime were committed, the NLSY 1997 survey also contains information on precisely how many of each of these crimes was committed over the course of the previous year. For some categories more specific information is available, for instance, under major theft, information on whether the theft was an automobile was included. Additionally, the value of the illicit activity was asked for major theft (value of goods stolen) and for selling drugs (value of goods sold). From the six categories above I choose to focus on two broad categories of crime. The first is economic crime, which includes crimes that may be primarily motivated by economic factors. To form a measure of economic crime, I create an indicator that is equal to 1 if the individual either committed major theft, or sold drugs. I also create a frequency of economic crime variable, that is categorical and ranges from 0 to 8. The variable was formed by ranking the number of offenses for both major theft and selling drugs into strictly positive quartiles, then combining them.[12]

[12]Since there is such a large mass at 0 'no crimes committed' I include 0 as a frequency, indepen-

The second measure is a form of psychological crime, which includes crimes that are more motivated by psychological gains. To form this measure, I classify assault and destroying property as more psychologically motivated crimes. For these types of crimes there exists very little or no pure monetary gains. Similar to the frequency formation discussed above, I form a frequency measure of psychological crimes based on the number of assaults and cases of destroying property.

By having access to all criminal activity committed by an individual, there is less concern with confounding factors that influence whether or not an individual is caught for a crime committed, and there is more breadth in reporting since there are certain illicit activities which may not warrant a formal arrest, but are nonetheless relevant when looking at determinants of juvenile crime. Since data is available both on formal arrests, as well as self-reported criminal activity it is possible to observe how frequently arrests occurred, when an individual self-reported committing some form of criminal activity. Table 1 summarizes these frequencies, by different self-reported criminal acts. The proportion of times an individual reported being arrested given he or she committed a criminal act ranged from approximately 21% for cases of minor theft to 38% for a case of major theft.[13] These figures illustrate the potential for there to be a large discrepancy between juvenile crimes actually committed, and those for which arrests were made.[14]

In order to form a direct measure of an individuals perception of the probability of being punished for committing a crime, I create a measure formed from questions that asked, "What is the percent chance that you would be ar-

dent of the positive quartiles. Because of this, there are 9 possible categories in total.

[13]Minor theft is defined as theft of something worth under $50, while major theft is defined as theft of something worth over $50.

[14]Unfortunately, beyond a measure of the monetary value for some types of criminal activity, detailed information about the particular act committed is unavailable. Thus, for example, individuals may not have been arrested because they were not caught, or they may received differential treatment due to socioeconomic status or context of the activity.

rested if you stole a car?", and then further asked, "Suppose you were arrested for stealing a car, what is the percent chance that you would be released by the police without charges or dismissed at court?".[15] Having a measure of an individual's belief in the probability of being punished for a serious offense provides a way to examine the effect of the criminal justice system at the micro level, not typically available in other studies.

III Summary Statistics

To get a more complete picture of juvenile crime patterns in the United States, I look at some preliminary relationships between criminal activity and various economic and demographic factors. Table 2 looks at the relationship between gender, race and various forms of criminal activity. Consistent with the figures presented earlier in the paper, the gender divide for criminal activity is very apparent. The proportion of males who report being arrested is 9% which is three times the proportion for females. The proportion of blacks who report being arrested is similarly larger than that of whites, and when race is further broken into gender it becomes evident that the racial differential is being driven by the fact that black males are more likely to be arrested than white males. In contrast to males, black females are less likely to be arrested than white females. When I examined the annual number of arrests (among those who were arrested), the patterns that emerge are similar, with one exception being that of white females now having a lower absolute number of annual arrests than black females.

A more interesting observation arises when looking at economic crime. Looking at males and females the pattern is similar (though males report being

[15]Since the probability of being punished = Probability of being arrested - Probability of being arrested and released, a simple application of Bayes' Rule yields the desired variable.

arrested 'only' twice as much as females), however looking at economic crime by race, the proportion of blacks that commit economic crime is now lower than that of whites. Both the proportion of white males and white females that commit economic crime are similarly larger than their black counterparts, with white females having almost two times the proportion of individuals causing economic crime than black females. When I looked at the frequency of annual economic crimes committed, the figure for males is over two times that of females, while for whites the frequency is almost 40% larger than for blacks. When splitting race by gender, the frequency figure for white males is just under 15% larger than black males, while for white females the figure is approximately 2.5 times that of black females.

Looking at the corresponding figures for psychological crime along racial and gender lines, males are almost two times more likely than females to cause psychological crime, while there is little distinction between blacks and whites. White males proportionately cause slightly more psychological crime than black males, while for females, it is black females who engage in just over 20% more psychological crime. When I examined the annual frequency of psychological crime committed, males cause crime at over double the rate of females, while whites commit psychological crime at a slightly higher rate than blacks, with white males leading black males, and the reverse for females.

In addition to gender and race, Table 2 further takes a look at some family background information: the educational background of the youth's parents, and the family structure. Individuals are grouped according to the level of education of the most educated parent, either less than high school, high school, or at least some college. Family structure is grouped into three categories: two biological parents, one biological parent and one non-biological parent, single biological parent, or other. Looking at the proportion of individ-

uals arrested by parent's education, the expected pattern is evident, with the proportion of youth from parents with less than high school education having an arrest rate of 7.5%, and that for youth with parents with at least college is 4.7%. For the proportion of the number of annual arrests to total individuals, the relationship again is negative as expected. The pattern for the proportion of individuals who commit economic crime is not in the expected direction, interestingly, children of parents with at least some college are slightly more likely to commit an economic crime than both children of parents who have less than a high school degree, or only a high school degree. For psychological crimes, the result is as expected, though proportionately the percentage difference between youth with the most educated parents and those with the least educated is slight (6%). Looking at the frequency of both economic and psychological crimes, for the former there is no evident pattern, while for the latter there is the expected declining relationship.

Finally, Table 2 also examines the relationship between family structure and crime. Looking at the proportion of youth arrested by family structure, those living with two biological parents were less likely to have been arrested than all other family structures (single parent families reported the highest proportion of arrests). The same is true for the proportion of annual arrests. Looking at the categories of economic and psychological crime, again living with two biological parents is associated with a lower proportion of these types of criminal activity, while living with two parents where exactly one is biological, or living with a single parent were both associated with having the highest proportion of criminal engagement. In terms of the annual frequencies of these crimes committed, the trend is similar.[16]

Table 3 reports the proportion of individuals arrested grouped by house-

[16]Interestingly, for the frequency of psychological crime, youth in families in the 'other' category are cause these crimes less frequently than even those with two biological parents.

hold income quartiles. There is a negative relationship between household income and being arrested, with just over 7% of the lowest income quartile having been arrested, and under 5% of the highest income quartile. The same negative relationship holds when looking at strictly positive number of arrests, the average annual number of arrests in the lowest income quartile is 1.9, while the corresponding number for the highest income quartile is 1.5. Also in Table 3, I examine the relationship between household income and the two classifications of crime I defined earlier, economic and psychological crime. Interestingly, the relationship between household income and the proportion of individuals who report engaging in these types of illicit activities is not as pronounced as in reported arrest rates, notably for economic crimes. Similarly, when looking at the frequency of these categories of activities and their relationship to household income, the pattern is again not as pronounced as the self-reported arrest data, with psychological crime again fitting the expected pattern slightly better.

Table 4 examines correlations between ability and criminal activity. The measure of ability I use is a percentile score generated from the results of four tests in the areas of mathematical knowledge, arithmetic reasoning, word knowledge, and paragraph comprehension.[17] Table 4 demonstrates the strong correlation between ability measures and criminal activity. The negative relationship between ability and criminal activity is starker than the corresponding relationship with household income. Over 8% of those individuals in the lowest ability quartile reported being arrested, while for the highest ability quartile the figure is just over 3%. When I examined the number of annual arrests (among those who committed at least one offense), those in the lowest ability quartile reported being arrested approximately 2 times, 60% more than the

[17]The measure is created by NLS program staff, further information can be found on their website.

corresponding figure for the highest ability quartile 1.26.[18]

Consistent with the pattern observed for household income, the relationship between ability and economic crime does not follow the ex ante expected negative relationship. For crime that is primarily economic in nature, ability does not appear to be a factor that correlates strongly with either the propensity to commit such a crime, or the frequency with which such activities are conducted. However, unlike the pattern observed for household income, there is a clear negative relationship between ability and crime that is psychological in nature. Among the lowest ability quartile, approximately 13% of individuals reported committing a form of psychological crime, while the corresponding proportion for highest ability individuals is under 10%. The frequency for which psychologically motivated crime was committed also exhibits the pattern, with the lowest ability individuals reporting a frequency of roughly 40% larger than the most able. These raw correlations indicate that the relationship between ability and crime may be different depending on the classification of crime.

The results in this section lend themselves to the general conclusion that psychological crime appears a better 'fit' than economic crime, for the pattern that would be ex-ante expected of individuals committing criminal activity. Individuals who have higher ability and have higher educated parents tend to commit less psychologically motivated crimes, however they actually tend to commit more economically motivated crime. Additionally, those with a higher income are less likely to commit psychological crime, while there is no clear relationship with respect to economic crime. In order to further investigate whether these factors differ significantly between economic and psychological crime, the next section conducts an exploratory cross sectional analysis.

[18]It should be noted, that the middle two ability quartiles do not significantly differ from one another.

IV Cross Sectional Analysis

To illustrate the importance in differentiating certain types of criminal activity, Table 5 reports some basic linear regressions. In these regressions the sample is restricted to only include those who are recorded in the survey as black or white, which is 85% of the total sample. It must be noted that the results in Table 5 are correlational, as they are computed without important control variables that are added later in this section; here I look at the biological factors of race, gender, and age. Columns 1 through 3 report a linear probability model looking at these three variables, with age squared included, while the final 3 columns add the interaction of white with male. The following discussion centers on the latter columns, with the former being presented for sake of comparison.

Looking at the binary dependent variable indicating whether an individual reported being arrested in a given year in column 4, being male, and in particular being a black male are statistically significantly associated with a higher likelihood of being arrested. The probability that black males will be arrested is roughly 9 percentage points higher than that of females, while for white males the figure is approximately 5 percentage points. Race is not a significant predictor of being arrested for females. Age enters as a concave quadratic, increasing with each year until it peaks at age 20, whereafter the probability of arrests decreases.[19]

Looking at the final two columns in Table 5 illustrates the differences between the probability of being arrested, and the probability of engaging in different types of criminal activity. Male is statistically significantly associated with a higher propensity to engage in both economic and psychological criminal activity, however the interaction between gender and race differs between

[19] It should be noted that this relationship controls for year fixed effects.

each type of crime. For economic crime, whites are almost 2 percentage points more likely to engage in this type of activity than blacks (see column 2), with the probability of white females engaging in economic crime larger than the corresponding probability for black females by around 2.6 percentage points, and white males were approximately 1 percentage point more likely than black males to engage in this activity. For psychological crime, the opposite is evident, whites are less likely than blacks to engage in psychological crime, however this result is largely driven by females, for males the difference between races are not statistically significant. Looking at the age quadratics, the effect of age on economic crime follows the concave pattern observed for arrests, while the sign of the age function for psychological crime is reversed (declining at a decreasing rate, until the age of 20, then increasing).

Table 6 reports the cross sectional regressions in the latter columns of Table 5, but with additional variables pertaining to employment (columns 1-3) and educational attainment/ability (columns 4-6). Looking at the employment regressions first, the cross sectional results are slightly counterintuitive. I include two measures of income, the first is of total annual income for the household the youth lives in, while the second is the youth's personal weekly income.[20] In column 1, as expected, household income is statistically significantly negatively related to the probability of being arrested in a given year. However, the second measure of a youth's personal weekly income is actually positively statistically significantly related to the probability of being arrested. In the sample, after controlling for very basic factors, youth with higher weekly incomes were proportionally more likely to be arrested for committing an offense. In terms of being employed or not, youth that were employed were slightly less likely to be arrested, however the difference is not statistically significant.

Looking at the effects of income for economic and psychological crime,

[20]The youth's weekly income refers to legitimate income earned in the labor market.

household income ceases to be statistically significant for both types of crime, while weekly income remains significant for both. For economic crime, the effect of being employed is actually positively, statistically significantly associated with committing economic crime, while for psychological crime it is insignificant. The positive association between committing an economic crime, and being employed is slightly counter-intuitive, though is not at odds with existing empirical work. Blumstein (1986) provides a summary of empirical work which has found that the employment-crime relationship at the micro level has been ambiguous in the literature, and there does not appear to be a consensus on whether being employed should be associated with higher or lower crime rates.

Turning to ability and education, looking at column 4, being currently enrolled in an education program in a given year is statistically significantly associated with a lower likelihood of being arrested, as is having completed (or currently in) high school or college. Looking at ability, as proxied by the asvab measure, being of higher ability is related to a lower probability of being arrested, as expected. The relationship between crime and ability is not uniform for all types of crime however. The relationship between ability and illicit economic activity is not statistically significant, and is actually slightly positive. This observation is contrary to that found in other studies, such as Levitt and Lochner (2001) who find that higher ability individuals are significantly less likely to commit property or violent crimes. For the other variables relating to education and enrollment, most have the same sign and statistical significance, with the exception of being enrolled in or finished college, which is not statistically significant. For psychological crime, the results more closely mirror those found for arrests, as ability is now in the 'usual' direction, and statistically significant.

Finally, Table 7 provides comprehensive linear regressions for all variables of interest, with the first 3 columns including all the income and ability related variables together from Table 6, and the next 3 presenting OLS regressions for all variables of interest.[21] Focussing on the latter results, in column 4, coming back to biological factors, whites are statistically significantly more likely than blacks to be arrested. Interestingly, after controlling for family background, education, and schooling, household income is actually associated with a higher likelihood of being arrested, while weekly income, and being employed are not statistically significant. However the education and ability variables are all statistically significant: being enrolled or having completed high school reduces the likelihood of being arrested by about a large 8.5%, while generally being enrolled in school, completing (or enrolled) in college, and having a higher ability all further are statistically significantly negatively associated with arrests in a given year. Looking at economic crime and psychological crime in columns 5 and 6, whites are more likely than blacks to commit economic crime, while white males are more likely than black males to engage in psychologically motivated criminal activity. Looking at income/employment variables, the results are similar to column 4, while for education they are similar with the exception of ability, which is actually positively related to committing criminal activity and being arrested in the case of economic crime. For psychological crime the coefficient on ability is negative, but not statistically significant.

The last columns also include information on whether or not an individual is a member of a gang. Being in a gang is statistically significantly, positively associated with all measures of criminal activity, and the magnitude is large, with those who are in a gang being approximately 22% more likely to be arrested, and 28% and 42% more likely to engage in economic or psychological criminal activity respectively. Regarding the youth's living situation, living with a

[21] One difference is that age is now specified linearly rather than quadratic.

partner was associated with a lower likelihood of arrest, however was not statistically significant for the two categories of criminal activity. Those that were married were statistically significantly less likely to engage in criminal activity across all three specifications, while those who live with their parents were not statistically significantly more likely to engage in any more or less crime than those on their own. In all three specifications, growing up with two biological parents is associated with a 2 to 2.5% lower probability of being arrested, or engaging in economic or psychological criminal activity.

V Methodology

While the cross sectional analysis provide some interesting facts, because of specification issues the observations noted in previous sections must be interpreted as correlational rather than causal. Consider a basic regression framework for a given individual i, at time t:

$$arrested_{it} = \boldsymbol{X_{it}}\boldsymbol{\beta} + \boldsymbol{\alpha_i} + \epsilon_{it} \tag{1}$$

Where $\boldsymbol{X_{it}}$ is a vector of observed variables which may vary over time, such as income, employment, education, family situation, gender, and race.[22] $\boldsymbol{\alpha_i}$ is a vector of unobserved time-invariant individual characteristics or fixed effects, such as inherent ability, genetic factors, and 'moral values', and ϵ_{it} is the error term. In the cross sectional regressions reported earlier in the paper, $\boldsymbol{\alpha_i}$ is unobserved and so would be included in the error term. This is problematic because, for example, suppose that there is heterogeneity in 'moral values' (i.e. heterogeneity in psychological benefits or costs of engaging in criminal activity). When looking at whether or not an individual is a gang member, this

[22] While gender and race are (usually) time invariant, this specification remains appropriate.

will depend on an individuals specific 'moral value'. Since this value is not observed, it is in $\boldsymbol{\alpha_i}$, and consequently in the regressions reported earlier it will be in the error term. This is a classic omitted variable problem, and will lead to the coefficient estimates on the gang variable being biased and inconsistent. For this reason, as has been emphasized, the cross sectional regression results should be interpreted as correlational, rather than structural or causal.

To circumvent the omitted variable problem it is possible to use the panel data structure of the NLSY to difference out the time invariant unobserved fixed effect $\boldsymbol{\alpha_i}$. One draw back of such a method is that all time invariant variables are differenced out, and many of the useful demographic variables in the NLSY 1997 will no longer be available for interpretation. After differencing equation (1) becomes:

$$\Delta arrested_i = \Delta \tilde{\boldsymbol{X}}_{\boldsymbol{i}} \boldsymbol{\beta} + \Delta \epsilon_{it} \quad (2)$$

[23]

Where capital delta represents not period to period differencing, but differencing using the cross-period average of each variable. Under the fixed effects specification, the omitted variables that were causing OLS estimates to be biased and inconsistent are no longer an issue.[24]

VI Results

The fixed effects regressions outlined in the previous section begin with Table 8, an analysis of how changes in various factors purportedly affect the like-

[23] $\tilde{\boldsymbol{X}}_{\boldsymbol{i}}$ is identical to $\boldsymbol{X_i}$ in equation (1), but without any time invariant variables.

[24] There is an issue however, if the fixed effects are dynamic, rather than static, which could be the case in certain instances. For example, one may not believe that 'moral values' are static during a young adults life, but rather may change over time. If this were indeed the case, then the fixed effects strategy discussed above would not fully remove the omitted variable problem. For a more detailed look at the issue, see Bjerk (2008). For this paper I find it not unreasonable to assume that the relevant unobserved fixed effects such as 'moral values' do not vary from year to year in a meaningful way.

lihood of being arrested in a given year. Table 8 presents linear fixed effects regressions, while Table 9 presents the fixed effects logit counterparts. For ease of interpretation I focus on the linear regressions in Table 8, the results are broadly similar for both specifications. The first column reports the most basic specification which includes income/employment variables, as well as an indicator for being in a gang. Joining a gang increases the probability of committing a crime and being arrested by roughly 17%. Perhaps surprisingly, similar to the cross sectional regressions, household income is actually positively, and statistically significantly related to the probability of being arrested, while the youth's weekly earnings are not statistically significant. In Levitt and Lochner (2001) they find that income is not a significant factor in crime rates after controlling for other factors, while Mocan and Rees (2005) find that income is negatively related to crime rates, however the latter use welfare receipts as a proxy for income, which may account for part of the discrepancy. Also, being employed is found to positively alter the probability of being arrested, a result which may help settle the debate regarding the effects of unemployment on crime at the micro level. While micro studies of unemployment are comparatively more scarce than their macro counterparts, Jacob and Lefgren (2003) find that there is a tradeoff when considering programs meant to bring youth together to 'keep them out of trouble'. On the one hand, programs provide monitoring and structure for youth which reduces property type crimes, while on the other hand, increasing the level of interaction among youth can lead to an increase in the amount of violent crime. Regarding employment, they conclude that certain types of employment programs (such as summer programs) may be the best way to reduce juvenile crime. The positive effect found in my estimates suggest that this conclusion should be further investigated before it is accepted as an appropriate crime reducing tactic. At the macro level, there

is some evidence showing that an increase in the local unemployment rate is associated with an increase in criminal activity (see Mocan and Rees (2005) and Levitt and Lochner (2001)).[25]

To further investigate the relationship between income and crime, the second column includes two new interaction terms of the income variables with the youth's age, demonstrating an interesting effect. The effect of income on criminal activity is positive for younger youth, and then becomes negative above a certain age. For youth slightly over 22 years old, the overall effect of household income on criminal activity is negative, while for those under this age the effect is positive. The same pattern holds for a youth's weekly income, however with the age cut-off occurring slightly later at just over 23 years old. This could potentially explain the results in Levitt and Lochner (2001) who found no significant relationship between crime and income.

The final two columns in Table 8 add education and enrollment variables (column 3) and further add relevant living situation variables (column 4). Focussing on the final column, the income pattern observed earlier is no longer significant for household income, but still significant and similar for the youth's weekly income. Being enrolled in school on its own, or being in or having completed college is not statistically significantly related to the probability of arrest; however, being enrolled or having completed high school is associated with an over 5% decrease in the probability of being arrested. Being a member of a gang remains statistically significantly positively associated with the likelihood of being arrested. In terms of cohabitation status, individuals who live with a partner are less likely to be involved in criminal activity, while marriage has no discernable effect. Youth that live with their parents were also not statistically significantly any more or less likely to engage in criminal activity, nor

[25] It should be noted that some studies have not been able to show any conclusive link between unemployment rates and criminal activity, for example Levitt (1997) and Machin and Meghir (2004).

were those that reside in a Metropolitan Statistical Area (MSA). The number of members in the household and whether youth lived with both biological parents were insignificant (unlike the cross sectional analysis), while the number of members in the household under the age of six was associated with a lower probability of committing criminal activity.

Table 10 presents the key regressions in Table 8 for the different categories of crime. Looking at the income variables, they are only statistically significant in the first regression of economic crime in column 1, and only for household income (in the same pattern as observed when the dependent variable was an indicator of being arrested). The same regression specification for psychological crime is in column 3, and household income is not statistically significant (and the signs are reversed). Whether or not an individual was employed was statistically significantly associated with more economic crime in the specification in column 1, similar to the finding for arrests, while for the other specifications in Table 10 it was not statistically significant. Curiously, being currently enrolled in school was positive and statistically significant at the 10% level, for all the regressions with the exception of economic crime in column 2, unlike the result for arrests found in Table 8. The positive relationship between enrollment and particular types of crime may lend support to Jacob and Lefgren (2003) who find that being in school decreases some types of crime among youth (property crime) while increasing other types (violent). One can note that for both psychological crime regressions, which includes violent assaults, the coefficient on being enrolled in school is statistically significant, and larger in magnitude than the economic crime regressions.

Also similar to the arrest regressions in Table 8 being enrolled in, or having completed high school has a negative and statistically significant effect on the probability an individual commits illicit economic or psychological activ-

ity (with the exception of the non-significant result in column 3). Unlike high school, college enrollment or degree completion actually leads to an increase in the probability individuals will commit such crimes, that is statistically significant in all regressions with the exception of the last one. As expected the coefficient on gang is positive and highly statistically significant in all regressions. Living with a partner is again seen to negatively affect the probability of engaging in criminal activity, it is only statistically significant for psychological crime however. Similarly, the number of members under six in the household is again negative, but only statistically significant for economic crime.

Having examined three of the core categories of factors that affect juvenile crime, defined at the beginning of this paper: biological, social, and economic, there remains the fourth category, criminal justice which has been left out of the empirical specification thus far. Table 11 makes use of the variable containing information on individual's perception of being punished for committing a crime, discussed in the data section. Because the questions used to create this variable were only asked for half of the NLSY survey, I present these results in their own section. Here I focus only on the variable indicating the probability of being punished. Columns 1 to 3 present linear fixed effects regressions for each of the three main dependent variables relating to overall arrests, economic crime, and psychological crime. The final three columns (3 to 6) correspond to their non-linear fixed effects logit counterparts. Looking at the probability an individual was arrested, for both the linear and logit regressions, a higher probability of being punished for an offense was actually related to a higher likelihood of an arrest. This likely reflects that, since arrests are included in the definition of the punishment percentage, a higher probability of punishment leads almost by identity to a higher likelihood of being arrested. This identification problem will not be present in the regressions where the dependent

variable corresponds to criminal activity regardless of whether the individual is caught or an arrest made. Looking at the regressions for economic crime, an increase in the probability of being punished for an offense leads to a decrease in the probability that the youth will engage in criminal activity, though the coefficient in the linear regression is not statistically significant, however that in the logit regression is significant at the 10% level. For psychological crime, the coefficient is also negative, however it is far less significant in both the linear and non-linear specifications.

VII Conclusion

This paper has revisited the issue of the determinants of juvenile crime, focussing on four broad categories of determinants: biological, social, economic, and criminal justice. Rather than looking only at arrest data, which has been the focus of innumerable papers (see Blumstein (1986) for an extensive overview of this literature), I looked at two key categories of crime, those for which the benefits were relatively more economic in nature, and those for which gains were predominately psychological in nature. Among all the determinants of crime looked at, two were highly statistically significant throughout all the analysis done in this paper and for all dependent variables: gender, and belonging to a gang. Being male has been consistently shown in the literature to result in a much larger propensity to engage in criminal activity, see for example, Mocan and Rees (2005). This plays to the notion that biological factors do play a role in juvenile crime, though it is impossible to distinguish how much of this gender difference is due to factors present at birth, or learned behaviors resulting from societal gender norms. Race was also a factor that was statistically significant in some of the cross sectional specifications. While blacks were proportionately more likely to commit crimes, after controlling for various de-

mographic, income, and education variables, whites were actually more likely to engage in these activities.[26]

Regarding economic factors that determine crime, there was very little evidence that parental or youth income played a large role in the decision to engage in criminal activities. There is some evidence that for younger youth, parental income actually increases criminal activity, and that after a certain age the effect is reversed. Employment also appeared to have either no effect on criminal activity or a positive one, counter to what one might expect.

Education and enrollment were similarly mixed in their effect on crime. Being in high school, or having completed high school was one key factor which appeared to have a negative and statistically significant impact on the likelihood of engaging in criminal activity, while being enrolled was found to either be insignificant or actually increase the propensity to engage in such illicit activity.

Another result from the analysis was that participation in economic crime and psychological crime was not uniform across the various determinants investigated in this paper. In particular, a pattern observed in the basic summary statistics and cross sectional results was that psychological crime was more related to the pattern for data on arrests, whereas economic criminal activity tended to follow a more unique pattern. For example, in the cross sectional regressions, ability tended to be negatively related to criminal activity in the case of arrests and psychological crime, however it tended to be positively related to such activity in the case of economic crime. Additionally, when evaluating the effect of the criminal justice system on juvenile decisions for whether to engage in criminal activity, a greater punishment was found to have a stronger deterrent effect for economic crime than for psychological crime. One hypothetical implication of this pattern is that individuals who engage in economically mo-

[26] In the case of psychological crime, this racial difference was not true for females.

tivated crimes behave in a more rational (or pre-meditated) fashion than those that commit psychologically motivated crimes.

The results in this paper suggest that in order to reduce juvenile crime, policies directed towards income or employment may not have the desired results. The two key areas that do leave the possibility of successful policy work include those relating to high school completion, and targeting gangs. Moving out of a gang had the effect of reducing the probability of committing either economic or psychological crimes by between approximately 15% to 29%, while being enrolled in or having completed high school reduced the probability by between just over 1% to 6%. Another possible avenue to reduce crime through particular policies, would be to increase the probability of being punished for committing offenses (getting tougher on crime). There is some evidence that this may reduce certain types (more economic in nature) of crime, though the evidence is not overwhelming.

VIII Figures

Figure 1: Proportion of Youth Arrested Annually

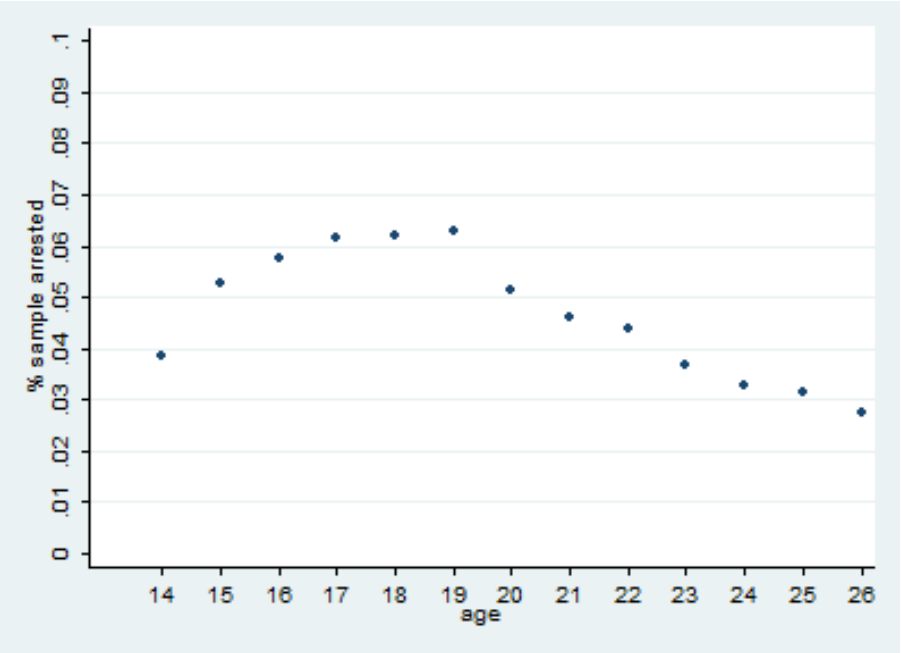


Figure 2: Proportion of Youth Arrested Annually by Gender

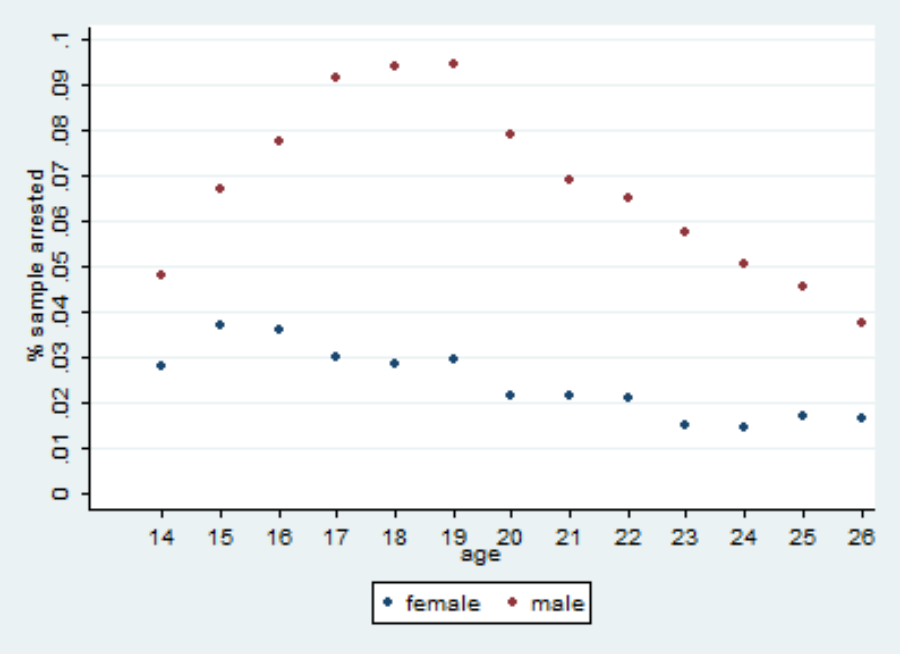


Figure 3: Proportion of Youth Arrested Annually, by Race

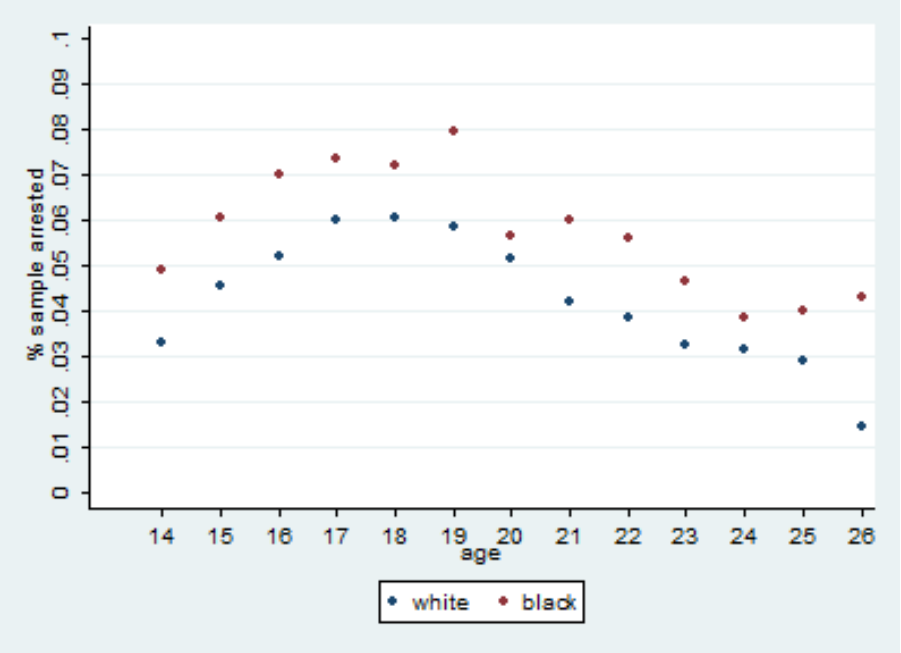


Figure 4: Number of Annual Arrests Among Youth

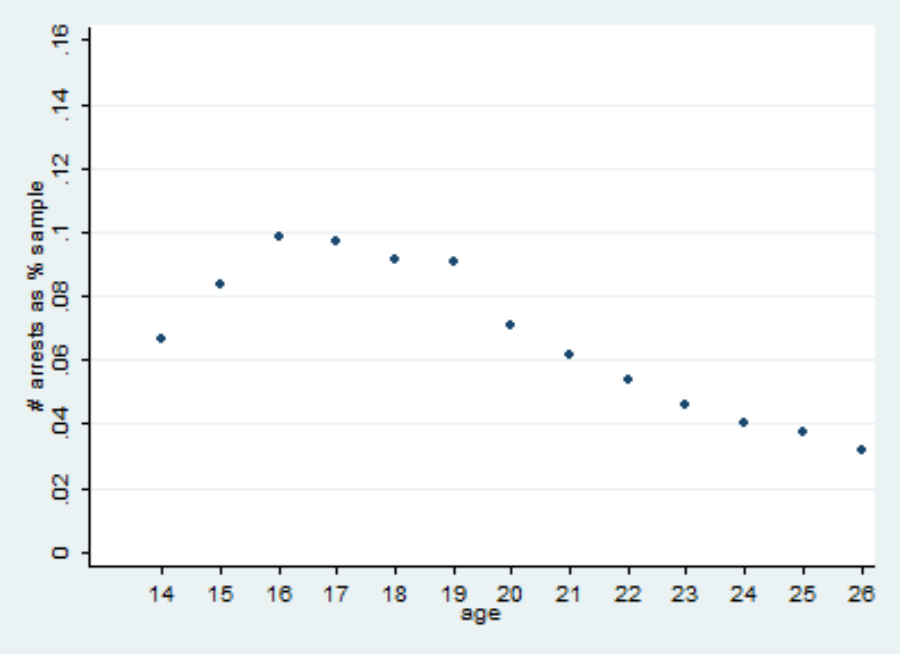


Figure 5: Number of Annual Arrests Among Youth by Gender

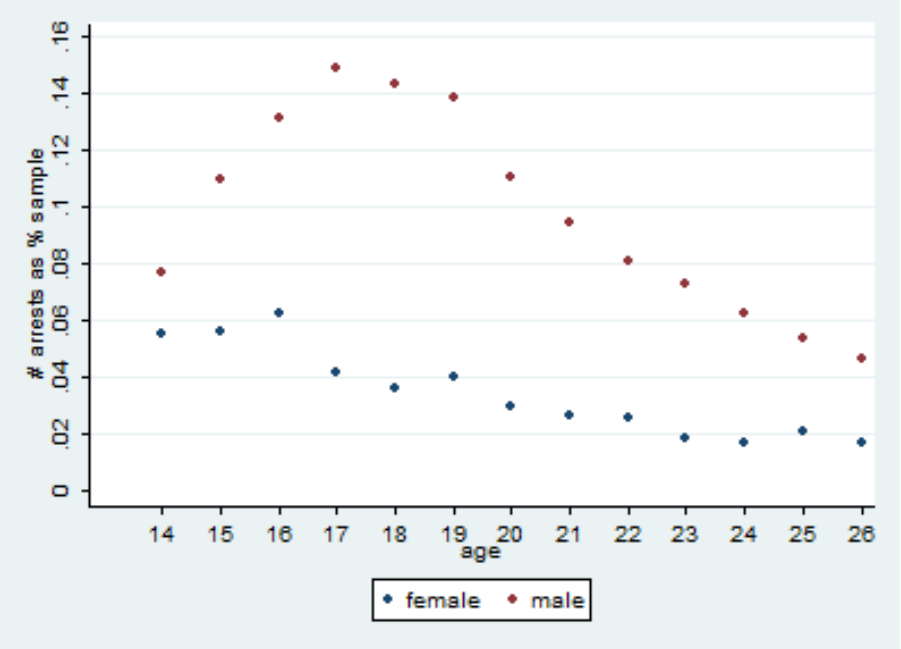
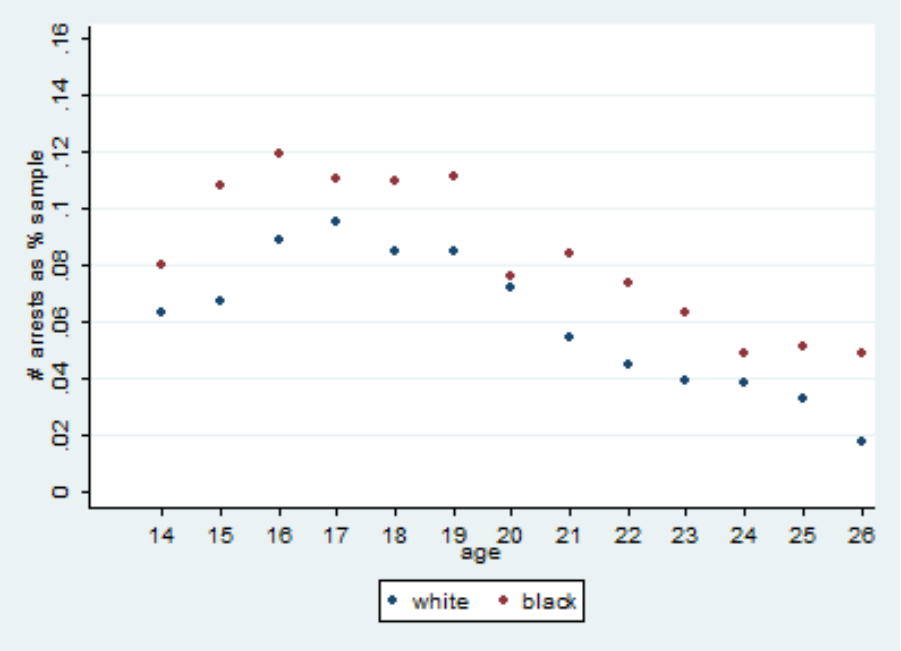


Figure 6: Number of Annual Arrests Among Youth, by Race



IX Tables

Table 1 - Criminal Activity and Arrest

Type of Crime	Percent Arrests Given Crime	Obs.
Assault	25.11	4337
Minor Theft	20.73	3897
Major Theft	38.34	1497
Sell Drugs	28.78	3270
Destroy Property	22.39	3376
Other Property	34.07	1406

The middle column reports the percentage of individuals who reported being arrested in a particular year, given that they reported committing the corresponding crime in the first column.

Table 2 - Summary of Race and Gender

	Arrested	Econ Crime	Psych Crime
Male	8.97	10.12	15.60
Female	3.09	5.13	8.32
Black	7.13	6.52	12.56
White	5.61	8.41	12.05
Black Male	11.60	9.46	15.45
White Male	8.04	10.53	15.94
Black Female	2.93	3.31	9.75
White Female	3.22	6.15	7.94
Parent less HS	7.52	7.54	12.47
Parent HS	6.41	7.57	12.09
Parent more HS	4.74	8.12	11.75
Bio Parents	4.35	6.41	11.37
Step Parents	7.42	9.71	15.60
Single Parent	8.26	9.11	14.91
Other Parent(s)	7.28	7.75	10.41

The data reported are the proportion of each group that committed the criminal act. Numbers in percentages.

Table 3 - Summary of Income and Crime

HH Income	Arrested	Econ Crime	Psych Crime
Quartile 1	7.21	7.58	10.40
Quartile 2	6.01	7.42	9.47
Quartile 3	5.03	7.49	9.23
Quartile 4	4.69	7.41	9.20

The data reported are the proportion of each group that committed the criminal act. Numbers in percentages.

Table 4 - Summary of Ability and Crime

Ability	Arrested	Econ Crime	Psych Crime
Quartile 1	8.20	7.48	13.29
Quartile 2	6.27	7.81	12.62
Quartile 3	4.69	8.19	11.80
Quartile 4	3.18	7.23	9.87

The data reported are the proportion of each group that committed the criminal act. Numbers in percentages.

Table 5 - Relationship Between Biological Factors and Crime

	Arrested (1)	Econ Crime (2)	Psych Crime (3)	Arrested (4)	Econ Crime (5)	Psych Crime (6)
Male	0.0617***	0.0512***	0.0778***	0.0873***	0.0624***	0.0634***
	(0.00194)	(0.00247)	(0.00298)	(0.00373)	(0.00401)	(0.00539)
White	-0.0167***	0.0177***	-0.00765**	0.00189	0.0261***	-0.0186***
	(0.00217)	(0.00256)	(0.00325)	(0.00209)	(0.00291)	(0.00408)
White Male				-0.0375***	-0.0164***	0.0211***
				(0.00435)	(0.00505)	(0.00644)
Age	0.0233***	0.0172***	-0.0761***	0.0230***	0.0173***	-0.0762***
	(0.00393)	(0.00541)	(0.00721)	(0.00392)	(0.00541)	(0.00721)
Age^2	-0.000583***	-0.000532***	0.00170***	-0.000577***	-0.000535***	0.00170***
	(9.61e-05)	(0.000139)	(0.000182)	(9.60e-05)	(0.000139)	(0.000182)
Year	-0.00255***	-0.00234**	-0.00957***	-0.00249***	-0.00232**	-0.00960***
	(0.000819)	(0.00111)	(0.00126)	(0.000819)	(0.00111)	(0.00126)
Observations	59609	46048	46093	59609	46048	46093
R^2	0.019	0.012	0.035	0.020	0.013	0.035

All columns are OLS regressions. *, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels.
Robust standard errors in parentheses

Table 6 - Relationship Between Employment, Education and Crime

	Arrested (1)	Econ Crime (2)	Psych Crime (3)	Arrested (4)	Econ Crime (5)	Psych Crime (6)
Male	0.0790***	0.0641***	0.0640***	0.0728***	0.0557***	0.0552***
	(0.00403)	(0.00442)	(0.00597)	(0.00430)	(0.00456)	(0.00623)
White	0.00159	0.0244***	-0.0193***	0.0135***	0.0338***	-0.00652
	(0.00227)	(0.00313)	(0.00450)	(0.00264)	(0.00347)	(0.00490)
White Male	-0.0297***	-0.0186***	0.0189***	-0.0294***	-0.0162***	0.0246***
	(0.00466)	(0.00549)	(0.00707)	(0.00500)	(0.00571)	(0.00736)
Age	0.0252***	0.0124**	-0.0762***	0.0132***	0.0134**	-0.0828***
	(0.00442)	(0.00619)	(0.00819)	(0.00469)	(0.00669)	(0.00898)
Age^2	-0.000618***	-0.000426***	0.00170***	-0.000348***	-0.000457***	0.00189***
	(0.000108)	(0.000157)	(0.000205)	(0.000114)	(0.000169)	(0.000224)
Enrolled				-0.0151***	-0.0228***	-0.0140***
				(0.00303)	(0.00408)	(0.00462)
Ability				-0.000263***	1.81e-05	-0.000255***
				(4.36e-05)	(5.75e-05)	(6.97e-05)
High School				-0.0789***	-0.0381***	-0.0597***
				(0.00571)	(0.00588)	(0.00682)
College				-0.0136***	-0.00498	-0.0105**
				(0.00311)	(0.00404)	(0.00463)
HH Income	-7.74e-08***	-3.41e-09	-3.24e-09			
	(2.04e-08)	(2.94e-08)	(3.38e-08)			
Weekly Income	4.38e-06***	4.42e-06**	6.20e-06***			
	(1.59e-06)	(1.97e-06)	(2.24e-06)			
Employed	-0.00431	0.0162***	0.00289			
	(0.00280)	(0.00337)	(0.00436)			
Year	-0.00218**	-0.00253**	-0.00952***	-0.00197**	-0.00486***	-0.0122***
	(0.000884)	(0.00121)	(0.00140)	(0.000925)	(0.00126)	(0.00144)
Observations	50674	39703	39734	43853	36244	36279
R^2	0.019	0.013	0.035	0.038	0.017	0.042

All columns are OLS regressions. *, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels.
Robust standard errors in parentheses

Table 7 - Cross Sectional Correlates of Crime

	Arrested (1)	Econ Crime (2)	Psych Crime (3)	Arrested (4)	Econ Crime (5)	Psych Crime (6)
Male	0.0644***	0.0576***	0.0556***	0.0553***	0.0485***	0.0329***
	(0.00463)	(0.00501)	(0.00686)	(0.00697)	(0.00680)	(0.00860)
White	0.0111***	0.0312***	-0.00598	0.0144***	0.0370***	-0.00805
	(0.00286)	(0.00372)	(0.00531)	(0.00443)	(0.00493)	(0.00652)
White Male	-0.0223***	-0.0191***	0.0223***	-0.00770	-0.0119	0.0326***
	(0.00534)	(0.00618)	(0.00804)	(0.00806)	(0.00824)	(0.00989)
Age	-0.000459	-0.00480***	-0.0117***	-3.96e-05	-0.00496***	-0.00922***
	(0.000993)	(0.00129)	(0.00154)	(0.00168)	(0.00179)	(0.00197)
HH Income	3.25e-08	4.36e-08	7.06e-08*	1.06e-07***	1.21e-07***	1.76e-07***
	(2.45e-08)	(3.49e-08)	(3.98e-08)	(3.63e-08)	(4.33e-08)	(4.93e-08)
Weekly Income	1.84e-06	3.67e-06	5.60e-06*	1.87e-07	4.04e-06	5.75e-06
	(1.44e-06)	(2.37e-06)	(2.88e-06)	(1.37e-06)	(3.27e-06)	(3.57e-06)
Employed	0.00265	0.0244***	0.000253	0.00150	0.00834	-0.00418
	(0.00299)	(0.00360)	(0.00477)	(0.00506)	(0.00534)	(0.00649)
Enrolled	-0.0134***	-0.0219***	-0.0109**	-0.00991**	-0.0251***	-0.0109*
	(0.00328)	(0.00444)	(0.00500)	(0.00468)	(0.00545)	(0.00597)
Ability	-0.000286***	-1.27e-05	-0.000287***	-0.000195***	0.000243***	2.24e-05
	(4.55e-05)	(6.11e-05)	(7.43e-05)	(7.25e-05)	(8.47e-05)	(9.50e-05)
High School	-0.0758***	-0.0383***	-0.0573***	-0.0809***	-0.0367***	-0.0648***
	(0.00642)	(0.00670)	(0.00786)	(0.00815)	(0.00771)	(0.00891)
College	-0.0149***	-0.00748*	-0.0227***	-0.0236***	-0.0134**	-0.0213***
	(0.00328)	(0.00438)	(0.00494)	(0.00488)	(0.00564)	(0.00612)
Gang				0.224***	0.280***	0.419***
				(0.0337)	(0.0346)	(0.0356)
Partner				-0.0188***	-0.000912	-0.0109
				(0.00639)	(0.00732)	(0.00760)
Married				-0.0153**	-0.0485***	-0.0210**
				(0.00749)	(0.00765)	(0.00906)
Lives at Home				0.00691	0.000896	0.00520
				(0.00734)	(0.00796)	(0.00892)
In MSA				-0.00214	0.00661**	0.00238
				(0.00266)	(0.00275)	(0.00312)
HH Size				-0.00287*	-0.00203	-0.00199
				(0.00151)	(0.00155)	(0.00183)
Members U6				-0.00569	-0.00753**	0.00300
				(0.00367)	(0.00367)	(0.00463)
Bio Parents				-0.0210***	-0.0251***	-0.0199**
				(0.00655)	(0.00731)	(0.00816)
Year	-0.00210**	-0.00579***	-0.0103***	-0.00188	-0.00793***	-0.0133***
	(0.000993)	(0.00136)	(0.00158)	(0.00166)	(0.00189)	(0.00210)
Observations	37588	31504	31527	17496	17498	17514
R^2	0.034	0.018	0.040	0.060	0.043	0.064

All columns are OLS regressions. *, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels.
Robust standard errors in parentheses

Table 8 - Determinants of Criminal Activity Leading to Arrest (OLS)

	(1)	(2)	(3)	(4)
HH Income	7.35e-08***	6.64e-07***	3.38e-07	1.23e-07
	(2.31e-08)	(1.76e-07)	(2.17e-07)	(4.28e-07)
Age*HH Inc		-2.98e-08***	-1.40e-08	-5.06e-09
		(8.54e-09)	(1.07e-08)	(2.19e-08)
Weekly Income	1.71e-06	2.78e-05*	4.34e-05**	4.96e-05*
	(2.12e-06)	(1.49e-05)	(1.77e-05)	(2.54e-05)
Age*Weekly Inc		-1.20e-06*	-2.06e-06**	-2.43e-06**
		(6.58e-07)	(8.11e-07)	(1.21e-06)
Employed	0.00998***	0.00772**	0.00710**	0.00602
	(0.00299)	(0.00308)	(0.00323)	(0.00588)
Enrolled			0.00210	-0.00688
			(0.00359)	(0.00531)
High School			-0.0392***	-0.0568***
			(0.00909)	(0.0141)
College			0.00454	0.00590
			(0.00405)	(0.00659)
Gang	0.168***	0.168***	0.158***	0.148***
	(0.0195)	(0.0195)	(0.0203)	(0.0337)
Partner				-0.0273***
				(0.00783)
Married				-0.00358
				(0.00944)
Lives at Home				-0.00929
				(0.0107)
In MSA				-0.00583
				(0.00625)
HH Size				0.00326
				(0.00213)
Members U6				-0.0110*
				(0.00573)
Bio Parents				0.0124
				(0.0113)
Year	-0.00344***	-0.00239***	-0.00302***	-0.00170
	(0.000516)	(0.000568)	(0.000994)	(0.00218)
Observations	53383	53383	47282	24881
R^2	0.008	0.008	0.009	0.011

All columns are OLS regressions with fixed effects. The dependent variable is an indicator variable for whether or not an individual was arrested in a particular year. *, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels. Robust standard errors in parentheses.

Table 9 - Determinants of Criminal Activity Leading to Arrest (Logit)

	(1)	(2)	(3)	(4)
HH Income	1.71e-06***	1.62e-05***	8.22e-06*	6.74e-06
	(5.36e-07)	(4.25e-06)	(4.78e-06)	(9.90e-06)
Age*HH Inc		-7.40e-07***	-3.40e-07	-2.98e-07
		(2.15e-07)	(2.43e-07)	(5.10e-07)
Weekly Income	2.06e-05	0.000554*	0.00145***	0.00224**
	(1.98e-05)	(0.000308)	(0.000452)	(0.00109)
Age*Weekly Inc		-2.48e-05*	-7.02e-05***	-0.000109**
		(1.44e-05)	(2.20e-05)	(5.32e-05)
Employed	0.205***	0.163***	0.120*	0.106
	(0.0614)	(0.0630)	(0.0678)	(0.119)
Enrolled			0.0836	-0.0841
			(0.0848)	(0.130)
High School			-0.443***	-0.558***
			(0.0977)	(0.162)
College			0.0426	0.0528
			(0.103)	(0.173)
Gang	1.136***	1.134***	1.074***	0.863***
	(0.124)	(0.124)	(0.130)	(0.212)
Partner				-0.542***
				(0.144)
Married				-0.570**
				(0.274)
Lives at Home				-0.184
				(0.188)
In MSA				-0.137
				(0.110)
HH Size				0.0754*
				(0.0420)
Members U6				-0.179*
				(0.102)
Bio Parents				0.365
				(0.227)
Year	-0.0737***	-0.0495***	-0.0474**	0.00598
	(0.0103)	(0.0119)	(0.0190)	(0.0404)
Observations	12181	12181	10092	3823

All columns are Logit regressions with fixed effects. The dependent variable is an indicator variable for whether or not an individual was arrested in a particular year.
*, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels.
Robust standard errors in parentheses.

Table 10 - Determinants of Economic and Psychological Crime (OLS)

	Econ Crime	Psych Crime	Econ Crime	Psych Crime
	(1)	(2)	(3)	(4)
HH Income	9.50e-07***	7.22e-07	-4.03e-07	7.16e-07
	(3.06e-07)	(4.56e-07)	(3.92e-07)	(5.32e-07)
Age*HH Inc	-4.87e-08***	-3.54e-08	2.15e-08	-3.17e-08
	(1.56e-08)	(2.34e-08)	(2.01e-08)	(2.71e-08)
Weekly Income	3.22e-05	-3.51e-05	-1.05e-05	1.02e-05
	(2.86e-05)	(4.98e-05)	(2.01e-05)	(4.03e-05)
Age*Weekly Inc	-1.57e-06	1.66e-06	4.36e-07	-4.75e-07
	(1.36e-06)	(2.33e-06)	(9.60e-07)	(1.90e-06)
Employed	0.0186***	0.00387	0.00191	0.00709
	(0.00364)	(0.00565)	(0.00457)	(0.00687)
Enrolled	0.00773*	0.00330	0.0134**	0.0121*
	(0.00424)	(0.00538)	(0.00536)	(0.00664)
High School	-0.0184**	-0.0210*	-0.0127	-0.0580***
	(0.00877)	(0.0123)	(0.0100)	(0.0145)
College	0.0124**	0.0119*	0.0167***	0.00185
	(0.00482)	(0.00713)	(0.00600)	(0.00848)
Gang	0.246***	0.153***	0.286***	0.239***
	(0.0212)	(0.0294)	(0.0234)	(0.0392)
Partner		-0.00846		-0.0173**
		(0.00760)		(0.00867)
Married		-0.0156		-0.00993
		(0.0100)		(0.0118)
Lives at Home		0.00512		0.00261
		(0.0106)		(0.0120)
In MSA		-0.00688		-0.0142**
		(0.00609)		(0.00684)
HH Size		0.00144		-0.000933
		(0.00205)		(0.00235)
Members U6		-0.0105**		-0.00453
		(0.00505)		(0.00653)
Bio Parents		-0.0114		-0.00422
		(0.0115)		(0.0135)
Year	-0.00905***	-0.0107***	-0.0277***	-0.0179***
	(0.00119)	(0.00212)	(0.00150)	(0.00244)
Observations	42969	24900	43009	24921
R^2	0.021	0.015	0.045	0.029

All columns are OLS regressions with fixed effects. The dependent variables are indicator variables for whether or not an individual committed either a psychologically or economically motivated criminal act in a particular year. *, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels. Robust standard errors in parentheses.

Table 11 - Criminal Justice and Crime

	Arrested (1)	Econ Crime (2)	Psych Crime (3)	Arrested (4)	Econ Crime (5)	Psych Crime (6)
Prob of Punish	0.000154***	-8.41e-05	-4.78e-05	0.00318***	-0.00168*	-0.000571
	(5.21e-05)	(5.50e-05)	(7.04e-05)	(0.00104)	(0.001)	(0.000804)
HH Income	4.70e-07	6.78e-07	-2.03e-07	1.56e-05	9.85e-06	-1.51e-06
	(4.93e-07)	(5.40e-07)	(6.92e-07)	(1.09e-05)	(9.12e-06)	(7.15e-06)
Age*HH Inc	-2.75e-08	-3.88e-08	1.43e-08	-9.02e-07	-5.79e-07	1.24e-07
	(2.64e-08)	(2.90e-08)	(3.73e-08)	(5.98e-07)	(5.02e-07)	(3.94e-07)
Weekly Income	0.000149**	0.000154***	-3.52e-05	0.00207**	0.00419***	-6.51e-05
	(7.36e-05)	(5.26e-05)	(6.63e-05)	(0.00105)	(0.00146)	(0.000922)
Age*Weekly Inc	-7.84e-06**	-8.69e-06***	1.97e-06	-0.000105*	-0.000223***	7.27e-06
	(3.87e-06)	(2.83e-06)	(3.65e-06)	(5.37e-05)	(7.65e-05)	(4.72e-05)
Employed	0.00290	0.0154***	-0.00114	0.0601	0.196**	-0.0381
	(0.00447)	(0.00476)	(0.00611)	(0.101)	(0.0925)	(0.0741)
Enrolled	0.00602	0.0114*	0.0189**	0.157	0.179	0.178*
	(0.00609)	(0.00678)	(0.00848)	(0.134)	(0.118)	(0.101)
High School	-0.0293**	-0.00771	-0.00121	-0.373**	-0.143	-0.047
	(0.0130)	(0.0122)	(0.0142)	(0.156)	(0.16)	(0.135)
College	0.00721	0.00696	0.0143*	0.201	0.145	-0.0147
	(0.00557)	(0.00684)	(0.00838)	(0.166)	(0.14)	(0.113)
Gang	0.121***	0.238***	0.256***	0.868***	1.507***	1.282***
	(0.0251)	(0.0256)	(0.0283)	(0.177)	(0.184)	(0.166)
Year	3.93e-06	-0.00190	-0.0330***	0.00685	-0.023	-0.365***
	(0.00177)	(0.00198)	(0.00258)	(0.0378)	(0.0344)	(0.0275)
Observations	27820	27834	27853	4101	5057	8239
R^2	0.006	0.016	0.030			

Columns 1-3 are OLS regressions with fixed effects, columns 4-6 are Logit regressions with fixed effects. The dependent variables are indicator variables for whether or not an individual was arrested, or engaged in psychological or economic categorized criminal acts, in a particular year. *, **, and *** indicate the coefficient is significant at the 10%, 5% and 1% levels. Robust standard errors in parentheses.

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