

# The Impact of Head Start Participation on the Criminal Behavior of Teenagers

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## ABSTRACT

The purpose of the present study is to estimate the effect of Head Start participation on the criminal behavior of teenagers. Using National Longitudinal Survey of Youth data, the present study finds that participation in the Head Start program does not reduce the likelihood that a person engages in criminal activity. In fact, results of the present study show that, holding all other factors constant, teenagers who had participated in the Head Start program as children were more likely to be arrested but were no more likely to commit a crime than a teenager who did not participate in the program as a child. These results are rather robust since factors such as race, sex, and family and peer influences are all held constant.

## INTRODUCTION

Head Start is a federally-funded but locally administered program devoted to early childhood development. Begun in 1965, Head Start enrolls over 900,00 children in over 1600 programs nationwide. The vast majority of children attending these programs, which are run by local non-profits or school systems, are 3 or 4 years old. For 2004, the Head Start program was appropriated almost \$6.8 billion, and the average cost per child was \$7,222. All data and background information on the Head Start program were obtained from the Head Start Bureau website.

When the program began in the 1960s, the objective was to help local communities meet the needs of disadvantaged children. There was a general consensus that children from lower income families were much more likely to do poorly in school and drop out, thus increasing the probability that these children would have poor employment prospects and hence be unable to break out of the cycle of poverty. Early proponents of Head Start believed that if intervention could happen during the pre-school years, then possibly these economically-disadvantaged children would stand a better chance of succeeding in school and therefore greatly increase their earnings potential. In addition to improved academic performance, other benefits of early intervention that have been espoused include improved health and reduced likelihood of future criminal activity.

There has been a limited amount of research conducted on the benefits of the Head Start program. Most of this prior research has concentrated on the impact of Head Start on future academic

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FALL 2007

performance (Cole and Washington 1986; Currie and Thomas, 1995; Currie and Thomas 2000). Only one paper has examined the effect of Head Start participation on future criminal activity (Garces, Thomas, and Currie 2002). In this paper, the authors use data on adults from the Panel Study of Income Dynamics for 1995 and attempt to determine if Head Start had any effect on a variety of individual outcomes, including completion of high school, attending college, and being arrested. Using a fixed effects model with a sample size of 3255, they found that African-Americans who participated in Head Start were less likely to be charged with a crime; the probability that a white person was charged with a crime was not affected by Head Start participation.

The present study differs from the Garces, Thomas and Currie (2002) paper in several ways. First, instead of using the Panel Study of Income Dynamics, the National Longitudinal Survey of Youth is used. This data set is uniquely suited to the estimation of an economic model of crime for young adults, since it contains a vast amount of personal information about the survey respondents, including information about any crimes that the respondents may have committed. Second, the year examined in the present study is 1998, a more recent year than the Garces, Thomas, and Currie paper. Third, only teenagers are examined in the present study; hence, the effects of Head Start should be more pronounced than in a study looking only at adults. Finally, variables capturing family and peer influences are included in the present study; no prior study looking at the effects of Head Start has used family or peer influences as explanatory variables.

## **THEORETICAL FOUNDATIONS AND EMPIRICAL TECHNIQUE**

In order to construct an equation that estimates the determinants of crime at the individual level, prior research in the area of criminal behavior was examined (Carr-Hill and Stern 1973; Sandelin and Skogh 1986; Britt 1994; Young 1993; Howsen and Jarrell 1987; Benson, Kim, Rasmussen, and Zuehlke 1992; Rodney, Tachia, and Rodney 1999; Williams, Ayers, Abbott, Hawkins, and Catalano 1999; Videon 2002; Paschall, Ringwalt, and Flewelling 2003; Kierkus and Baer 2003; Eamon and Altshuler 2004; Simons, Simons, and Conger 2004).

Most of these studies use as their data aggregate measures of crime, such as county, state, or even national-level crime statistics, and aggregate measures of socioeconomic characteristics. While these studies have shed light on the effects of socioeconomic characteristics and institutional factors on criminal activities, there has been some criticism of the use of aggregate data to model criminal behavior, a behavior that is an individual choice about lifestyles and income-generating opportunities.

In addition, many of these prior studies use crime statistics data that may not capture all criminal activity, but only reported criminal activity. Hence, aggregate studies that use reported crime statistics not only ignore the individualistic nature of crime, but also seriously under-report the level of criminal activity within any given jurisdiction.

In order to develop a model more appropriate for the purposes of the present study, the economic model of crime developed by Becker (1968) is used as a theoretical basis. In this model, individuals are

characterized as being rational decision makers who respond to opportunities, both legitimate and illegitimate. The rational individual decides which activities to undertake by examining the expected returns from all opportunities. If a legitimate activity for an individual has a greater return than all other activities, then that individual takes advantage of that opportunity. If, however, an illegal activity has a greater return for an individual than all other activities, then that individual commits the criminal act.

In the present study, however, it is assumed that a teenager does not work, and hence there are no returns from legitimate activities. In addition, it is assumed that a teenager is provided all necessary goods and services by his or her parents; hence, stealing is not economically necessary.

Within the context of the present study, these assumptions are reasonable. For the sample used, the average annual income of the teenager was \$2,272, while the average income of the household was \$58,561. Hence, teenagers earned less than 4 per cent of total household income. Therefore, it is reasonable to assume that teenagers could not provide for themselves financially and that they were dependent on their parents for most, if not all, of their necessities. Hence, crimes are committed by teenagers for utility (happiness or satisfaction) and not for economic or monetary purposes.

It is important to note that these averages were calculated using limited samples. Most respondents did not answer the income questions. In addition, the sample used to estimate the teenage income was different from the sample used to estimate the household income. Finally, due to these data constraints, income was not included as an explanatory variable in any of the regressions estimated in the present study.

Given the above, one may model criminal behavior as follows:

$$(1) \text{ Max } U = f(C(I_p, I_f, \text{HEAD}, \mathbf{X}), \text{AG}, L(\mathbf{X}))$$

$$(2) \text{ s. t. } T = C + L$$

where  $U$  is total utility,  $C$  denotes criminal activities,  $\text{AG}$  is all goods,  $\mathbf{X}$  is a vector of variables that include socioeconomic characteristics and other variables that may explain the propensity to commit crimes, and  $L$  denotes leisure (non-criminal) activities. Assuming that the teenager has no income, and that all goods are provided by his or her parents, the only constraint would then be total time in a given day. Assuming  $T$  is less than 24, a teenager attempts to maximize his or her utility by allocating his or her time between criminal and non-criminal activities. In the present study, it is assumed that all non-violent crimes are property crimes, such as theft.

$L$  is assumed to be exogenous while  $C$  is assumed to depend upon the influences of the teenager's parents ( $I_p$ ), the influences of his or her friends ( $I_f$ ), the influences of Head Start ( $\text{HEAD}$ ), and other variables. Parental and peer influences and the influence of Head Start may be either positive or negative regarding criminal behavior. If all influences are positive in nature, then all time is spent pursuing non-criminal activities, since criminal activities are viewed as bads and not goods. If,

FALL 2007

however, the influences are negative in nature, then the individual would engage in criminal activities, since both criminal activities and leisure would be viewed as goods. Hence, in the first case, with criminal activities being viewed as a bad, a corner solution would result, and the teenager would only engage in non-criminal leisure activities. If, however, criminal activity is viewed as good, then an interior solution would result, and the individual would divide his/her time between non-criminal and criminal activities.

In attempting to empirically model participation in criminal activities, it is important to note that young adults make a discrete choice about whether or not to commit a crime. Using equations (1) and (2) as a theoretical basis, the following equation will be estimated:

$$\begin{aligned} (3) \quad CRIME = & a_1 MALE + a_2 SOUTH + a_3 WHITE + a_4 UR + a_5 URBAN \\ & + a_6 SIZE + a_7 AGE + a_8 PSMOKE + a_9 PDRINK + a_{10} PGANG \\ & + a_{11} PDRUG + a_{12} PARENTS + a_{13} DINNER + a_{14} NOHS \\ & + a_{15} HEAD + a_{16} EDMOM + a_{17} EDDAD + u \end{aligned}$$

where CRIME equals one if person committed a criminal act and zero otherwise; MALE equals one if person is male and zero otherwise; SOUTH equals one if person is from southern states and zero otherwise; WHITE takes value of one if person is white and zero otherwise; UR equals one if the unemployment rate for the respondent's labor market of current residence is less than six percent and zero otherwise; URBAN equals one if person lives in urban area and zero otherwise; SIZE is size of respondent's household; AGE is respondent's age; PSMOKE equals one if respondent's peers smoke cigarettes and zero otherwise; PDRINK equals one if respondent's peers drink alcoholic beverages and zero otherwise; PDRUG takes value of one if respondent's peers use illicit drugs and zero otherwise; PGANG equals one if respondent's peers belong to a gang and zero otherwise; PARENTS equals one if respondent has two parents and zero otherwise; DINNER is the number of times the respondent eats dinner with his or her family in one week; NOHS equals one if person dropped out or was expelled from school; HEAD equals one if respondent participated in the Head Start program; EDMOM equals one if the mother has at most a high school diploma and zero otherwise; EDDAD equals one if the father has at most a high school diploma and zero otherwise; and  $u$  is a normally-distributed, random error term. The family influences are represented by PARENTS and DINNER, and the peer influences are represented by PDRINK, PSMOKE, PDRUG, and PGANG.

Given the theoretical foundations discussed above, MALE, UR, URBAN, and NOHS are all expected to have positive effects on the probability that a person will engage in criminal activities; these hypotheses are supported by theory and prior research. WHITE, AGE, and SOUTH are all expected to have negative effects on criminal acts. The above are all variables in the  $X$  vector of socioeconomic characteristics. It is expected that EDMOM, EDDAD, SIZE, PARENTS, DINNER, and HEAD will have negative effects on the probability that a teenager will commit criminal acts. Finally, PSMOKE, PDRINK, PDRUG, and PGANG will all positively affect the probability that a teenager will commit a crime.

EDMOM and EDDAD are used as proxies for household income. The reason for using proxies is because there was little income data available, and if the income variable was included in the present study, after eliminating all observations with missing data, the final data set would have had fewer than 50 observations. Hence, the educational attainment of the parents was used in order to capture the effects of family income on the criminal activity of teenagers.

Given the binary nature of the dependent variable, equation (3) is estimated using a probit model. This equation is estimated for the year 1998. There are two reasons for selecting this year. First, for the data set used in the present study, there were numerous survey questions asked in 1998 regarding criminal activities, and family and peer influences. Second, in 1998 for the NLSY, all respondents were less than 18 years of age.

## DATA AND RESULTS

Data used in the present study were obtained from the National Longitudinal Survey of Youth. The NLSY was constructed to be a nationally representative sample of the civilian non-institutionalized population at the time of the initial survey in 1979. A second survey with a different cohort was started in 1997. The 1997 NLSY consisted of 8,984 men and women between the ages of 12 and 16. Interviews with NLSY respondents are conducted annually, and retention rates have been relatively high, averaging over 90 percent. Each age-sex cohort is represented by a multi-stage probability sample drawn by the Bureau of the Census from a list of sampling areas that had been constructed for the *Monthly Labor Survey*. The NLSY employed extensive household interviews in the selected sampling areas in order to obtain as random and as representative a sample as possible. In the present study, the 1997 NLSY was used.

In the survey, the respondent was asked if he or she performed any one of a variety of criminal acts. The five crimes reported by the NLSY are as follows: stolen anything worth less than \$50; stolen anything worth more than \$50; other property crimes; vandalism; and assault and battery.

In order to determine if the factors that affect criminal activity differ by the type or severity of crime committed, equation (3) was estimated for two types of crime: property crimes, which include stolen anything worth less than \$50, stolen anything worth more than \$50, and other property crimes; and violent crimes, which include vandalism (malicious behavior) and assault and battery.

According to the NLSY data, not all criminal acts resulted in the arrest of the perpetrator; in fact, it is unknown if any of the individuals were arrested for any of the reported criminal behavior. Hence, for that reason, equation (3) is also estimated with the dependent variable ARREST, which equals one if person was arrested in the past year for one of the five crimes listed and zero otherwise.

Even though the data on illegal activities in the NLSY are based on self-reports, the mode of data collection employed by the NLSY may be as good or better than other methods of data collection. Although most studies in this area of data collection have questioned the validity of self-reported

criminal data, the structure of the NLSY prevents the researcher from determining any potential over- or under-reporting by respondents. For a more complete discussion of the potential problems that arise from the use of self-reported criminal data, the reader is referred to the vast literature on this topic (Green 1990; Menard and Elliot 1990; Wyner 1980; Sampson 1985).

As previously noted, the NLSY surveys over 8,000 individuals every year; however, due to a variety of problems, there are sometimes missing responses. After eliminating all of the observations with missing responses, the sample used in the present study has 3288 observations. Of those 3288, 29.6 percent were involved in a criminal act in 1998, but only 5.2 percent were arrested. This descriptive statistic validates the estimation of both an arrest equation and a criminal act equation.

Descriptive statistics for all variables used in the present study are presented on Table 1. These statistics indicate that, for the sample examined in the present study, 66 percent are white, the average family size was 4.5, the average age was 15, 70 percent had two parents, the average number of family dinners a teenager had in a given week was 4.67, 4.4 percent of teenagers had either dropped out of school or were expelled, and 16.9 percent of respondents had participated in the Head Start program.

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

<b>Variable</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>
VIOLENT CRIME	0	1	0.216
PROPERTY CRIME	0	1	0.172
ARREST	0	1	0.052
MALE	0	1	0.522
SOUTH	0	1	0.360
WHITE	0	1	0.663
UR	0	1	0.185
URBAN	0	1	0.730
SIZE	2	12	4.5
AGE	1	17	15
PSMOKE	0	1	0.368
PDRINK	0	1	0.185
PGANG	0	1	0.107
PDRUG	0	1	0.255
PARENTS	0	1	0.699
DINNER	0	7	4.67
NOHS	0	1	0.044
HEAD	0	1	0.169
EDMON	0	1	0.809
EDDAD	0	1	0.777

Notes:  
N=3288

Regression results are shown in Tables 2, 3, and 4. Regarding both the property and violent crime regression results, HEAD is insignificant. This result indicates that, holding all other factors constant, including race, sex, and family and peer influences, teenagers who had participated in the Head Start program as children (5 years of age or younger) were no more likely to have been involved in criminal activity than a teenager who had not participated in Head Start. This result contradicts the result of Garces, Thomas and Currie (2002) and casts doubt on assertions made by such groups as Fight Crime: Invest in Kids that allege that Head Start graduates have lower crime rates.

**Table 2**  
**VIOLENT CRIME Regression Results**

Variable	Coefficient	Standard Deviation	Test Statistic
MALE	0.432	0.0518	8.342***
SOUTH	-0.053	0.0537	-0.988
WHITE	0.130	0.0597	2.180**
UR	0.054	0.065	0.840
URBAN	0.118	0.059	2.006**
SIZE	0.0004	0.0188	0.021
AGE	-0.065	0.0092	-7.083***
PSMOKE	0.165	0.063	2.601***
PDRINK	-0.037	0.077	-0.474
PGANG	0.271	0.0819	3.317***
PDRUG	0.216	0.071	3.041***
PARENTS	-0.092	0.059	-1.56
DINNER	-0.061	0.011	-5.610***
NOHS	0.276	0.114	2.414**
HEAD	0.0407	0.071	0.573
EDMOM	0.0157	0.069	0.226
EDDAD	-0.081	0.0657	-1.230

Notes:

Log-Likelihood = -1625.414

n=3288

\*\*\* = Significant at 1%

\*\* = Significant at 5%

\* = Significant at 10%

**Table 3**  
**PROPERTY CRIME Regression Results**

<b>Variable</b>	<b>Coefficient</b>	<b>Standard Deviation</b>	<b>Test Statistic</b>
MALE	0.258	0.0540	4.774 <sup>***</sup>
SOUTH	-0.165	0.057	-2.893 <sup>***</sup>
WHITE	0.077	0.062	1.228
UR	0.047	0.069	0.684
URBAN	0.097	0.062	1.559
SIZE	-0.034	0.0201	-1.699 <sup>*</sup>
AGE	-0.0486	0.0095	-5.092 <sup>***</sup>
PSMOKE	0.146	0.067	2.182 <sup>**</sup>
PDRINK	-0.0037	0.079	-0.046
PGANG	0.097	0.086	1.120
PDRUG	0.267	0.073	3.635 <sup>***</sup>
PARENTS	-0.1008	0.062	-1.62
DINNER	-0.059	0.011	-5.228 <sup>***</sup>
NOHS	0.075	0.124	0.604
HEAD	0.0175	0.075	0.234
EDMOM	-0.041	0.072	-0.570
EDDAD	-0.086	0.0683	-1.260

Notes:  
 Log-Likelihood = -1446.036  
 n=3288  
<sup>\*\*\*</sup> = Significant at 1%  
<sup>\*\*</sup> = Significant at 5%  
<sup>\*</sup> = Significant at 10%

**Table 4**  
**ARREST Regression Results**

<b>Variable</b>	<b>Coefficient</b>	<b>Standard Deviation</b>	<b>Test Statistic</b>
MALE	0.356	0.081	4.414 <sup>***</sup>
SOUTH	-0.242	0.086	-2.809 <sup>***</sup>
WHITE	0.126	0.090	1.401
UR	0.024	0.099	0.244
URBAN	0.334	0.103	3.231 <sup>***</sup>
SIZE	-0.0305	0.0288	-1.058
AGE	-0.125	0.0145	-8.591 <sup>***</sup>
PSMOKE	0.0034	0.098	0.035
PDRINK	0.125	0.110	1.144
PGANG	0.219	0.113	1.945 <sup>*</sup>
PDRUG	0.311	0.104	3.006 <sup>***</sup>
PARENTS	-0.297	0.087	-3.42 <sup>***</sup>
DINNER	-0.0556	0.016	-3.451 <sup>***</sup>
NOHS	0.363	0.151	2.406 <sup>**</sup>
HEAD	0.219	0.099	2.221 <sup>**</sup>
EDMOM	0.115	0.111	1.033
EDDAD	0.0068	0.103	0.067

Notes:  
 Log-Likelihood = -613.1325  
 n=3288  
<sup>\*\*\*</sup> = Significant at 1%  
<sup>\*\*</sup> = Significant at 5%  
<sup>\*</sup> = Significant at 10%



For the violent crime equation, MALE, WHITE, URBAN, AGE, PSMOKE, PGANG, PDRUG, DINNER, and NOHS are all statistically significant. These results indicate that family and peer influences are also significant in determining whether or not a teenager will commit a violent crime. Specifically, a young adult who eats many dinners with his or her family is much less likely to engage in violent crimes than a young person who has friends who use drugs, smoke, and are in gangs. In addition, the present study finds that young, white, urban males who dropped out of high school or were expelled are more likely to commit violent crimes than others.

For the property crime equation, MALE, SOUTH, SIZE, AGE, PSMOKE, PDRUG, and DINNER are all statistically significant. Once again, these results indicate that family and peer influences are significant in the determination of whether or not a teenager will commit a property crime. Specifically, a young adult who eats many dinners with his or her family is much less likely to engage in property crimes than a young person who has friends who use drugs or smoke. In addition, young males are more likely to commit property crimes than others.

Regarding the ARREST equation, HEAD is significant and positive, suggesting that Head Start graduates are more likely to be arrested. In fact, according to the results of the present study, Head Start graduates are 21.9 percent more likely to be arrested.

Concerning other significant explanatory variables in the ARREST regression, MALE, SOUTH, URBAN, AGE, PDRUG, PARENTS, DINNER, and NOHS are all statistically significant. Hence, young urban men who did not finish high school are more likely to be arrested. In addition, a teenager who has both parents and has dinner frequently with his or her family is much less likely to be arrested while a teenager who has friends who use drugs is much more likely to be arrested.

Interestingly, the educational attainment of the parents had no effect on either the criminal actions or the arrest of the teenage respondents. This result may suggest that the parents' educational attainment may be a less than satisfactory proxy for family income. Given the data constraints in the present study, however, no other suitable measure of family income was available.

## **CONCLUSION**

The purpose of the present study was to estimate the effect of Head Start participation on the criminal behavior of teenagers. Using National Longitudinal Survey of Youth data and only examining individuals between the ages of 13 and 17, the present study found that participation in the Head Start program does not reduce the likelihood that a person engages in criminal activity. Results of the present study show that, holding all other factors constant, teenagers who had participated in the Head Start program as children were more likely to be arrested but were no more likely to commit crimes, either violent or property in nature. These results are rather robust since factors such as race, sex, and family and peer influences are all held constant.

FALL 2007

These results may suggest one of two possible public policy implications. First, the Head Start program does not have as much of an affect on future individual behavior as its proponents would like to believe; hence, current funding levels are too high given the limited positive outcomes of the program. Second, the program is woefully under-funded; therefore, local agencies are not provided sufficient resources with which to engage in fruitful and long lasting interventionist programs with the economically-disadvantaged children of their local communities. Hence, funding levels should be greatly increased. Which implication is most likely the correct course of action is not addressed in the present study.

Finally, results of the present study also suggest that teenagers who have two parents and who eat dinner often with their families are much less likely to be arrested than teenagers who have friends that use drugs. In addition, young males, who never completed high school are much more likely to commit violent crimes and to be arrested. Unfortunately, family dinner opportunities and increased prestige for academic excellence among teenage peer groups are not areas in which government policies have had a great deal of success. Hence, the government's ability to reduce the root causes of the criminal activity of young adults may be rather limited.

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