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Does the Presence of Neighborhood Gang Affect Youth Criminal Behavior?

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Abstract

Studies show that neighborhood characteristics explain behavior in an important way. However, studies that consider neighborhood effects mostly explore family characteristics and neighborhood socioeconomic status. The objective of this study is to examine the relationship between a social institution in the neighborhood and youth behavior by examining whether the presence of neighborhood gangs affect youth delinquency and substance use. We use data from the National Longitudinal Survey of Youth 1997 (NLSY97) and employ Ordinary Least squares (OLS) and Fixed Effects (FE) specification to estimate the effect of the presence of neighborhood gang on substance use and delinquency. We find that after accounting for individual heterogeneity, the presence of neighborhood gangs in a youth's neighborhood increases the substance use index by 0.2 units but has no statistically significant effect on youth delinquency.

1. Introduction

Studies show that neighborhood characteristics explain behavior in an important way through formal or informal organizations (Jencks and Mayer, 1990; Leventhal and Brooks-Gun, 2000). It is essential to understand how neighborhoods influence criminal behavior to develop ways to reduce crime (Kubrin and Stewart, 2006). However, earlier studies explaining the rates of crime have focused mainly on individual characteristics (Benedict and Huff-Corzine, 1997; Clarke et al., 1988; Irish, 1989; MacKenzie et al., 1999). Later studies that consider peers and neighborhood effects, in addition to individual characteristics, explore family characteristics and neighborhood socioeconomic status (Antecol and Bedard, 2007; Comanor and Phillips, 2002; Kubrin and Stewart, 2006). Studies that explicitly consider the social institutions in the neighborhood are sparse. This study adds to the literature by examining the effect of gang presence in a youth's neighborhood on criminal behavior in the United States.

Using data from the National Longitudinal Survey of Youth 1997 (NLSY97), we examine whether the presence of neighborhood gang affects youth delinquency and substance use. We find evidence that the presence of gangs in a youth's neighborhood positively affects substance use after accounting for individual heterogeneity. We conclude that policies providing early guidance to youths about the effects of neighborhood gangs should be encouraged. Youths exposed to neighborhood gangs should be sensitized on the dangers of substance use. The remainder of the study is structured as follows: the following section presents the empirical framework. The data is presented in section 3, while the estimation results are presented in section 4. Section 5 concludes the study.

2. Empirical Framework

We explain the criminal behavior of youths with a model that assumes that participation in criminal behavior depends on individual characteristics and household/family background characteristics. We include an additional variable in the model to address whether the presence of gangs in a neighborhood affect a youth's criminal behavior. Specifically, the model estimated is as follows:

$$Y_{it} = \beta_0 + \beta_1 G_{it} + \beta_2 X_{it} + \theta_{it} + \varepsilon_{it} \qquad (1)$$

where

Y_{it} is the outcome variable indicating the criminal behavior of youth i at time t. G_{it} indicates if there are gangs present in the youth's neighborhood at time t. X_{it} is the vector of control variables. θ_{it} is the vector of state, county, and Metropolitan Statistical Area (MSA) fixed effects. ε_{it} is the error term. The effects of the covariates are captured by β_2. The parameter of interest is β_1 which captures the effect of neighborhood gang presence on the outcome variable.

3. Data
3.1 The Study Sample

Data used in this study is from the National Longitudinal Survey of Youth 1997 (NLSY97). The NLSY97 includes a nationally representative sample of 8,984 youths in the United States born between 1980 and 1984 and who were 12 to 16 years old as of December 31, 1996. The eligible youth and a parent received hour-long personal interviews in 1997. The interviews are carried out on an annual basis. Data from the annual interviews represent each round of the survey.

Many other similar studies have used the NLSY dataset as well. For example, Aliprantis (2017) investigates how black young males alter their behavior when living in violent neighborhoods. Bellair and McNulty (2009) also uses NLSY and conclude (1) gang members who sell drugs are significantly more violent than gang members that don't sell drugs and drug sellers that don't belong to gangs; (2) drug sellers that don't belong to gangs and gang members who don't sell drugs engage in comparable levels of violence; and (3) an increase in neighborhood disadvantaged intensifies the effect of gang membership on violence, especially among gang members that sell drugs. Tapia (2011) shows that gang membership, racial minority status, and their interaction each increase the risk of arrest and bias against these groups is most pronounced with less serious crimes.

The study sample comprise of observations of youths from four rounds of the NLSY97 sample for the years 1997, 1998, 1999, and 2000. These four rounds are used because the outcome variables considered are only reported in these rounds. Within these rounds, only youths with complete data and more than one observation across all rounds are used. Overall, there are 966 observations in the study sample. Of these observations, 474 are from round one, 7 from round two, 34 from round three, and 451 from round four. Also, 36 of the observations are from 12 youths with 3 observations across all rounds, while 930 observations are from 465 youths with 2 observations across all rounds.

3.2 Outcome Variables

We consider two outcome variables as proxies for criminal behavior: delinquency and substance use. We use the delinquency index score and substance use index score reported by the NLSY97 to measure the degree of delinquency and substance use. The delinquency index score measures the degree of delinquent or criminal actions of a youth. The scores range from 0 to 10. Higher scores indicate more instances of delinquency. The substance use index score, on the other hand, measures the degree of substance use by a youth. The scores range from 0 to 3 and higher scores indicate more instances of substance use. The measure of delinquency and substance use used in the paper are indices created by the NLSY97. Delinquency has mean of 1.2 and standard deviation of 1.9 and substance has mean of 1.23 and standard deviation of 1.15.

3.3 Covariates

Youths were asked if there were any gangs in their neighborhood or schools. This information is used to construct an indicator variable equal to 1 if there are gangs in a youth's neighborhood and 0 otherwise. The covariates capturing individual characteristics include youth's age, age square, age cube, gender, race, ethnicity and citizenship status. The covariates capturing family/household characteristics include place of residence, mother's age, parents' education, household size, parental disruption, household income to poverty ratio, and index of family routines. Finally, the neighborhood characteristics include population per square miles, proportion of family below the poverty line, serious crime rate and median family income.

The age of the youth is measured in years. Gender is a binary variable equal to 1 if the youth is male and 0 otherwise. The race and ethnicity of a youth is captured by the binary variables indicating whether the youth is Black, White, Asian, American Indian or Hispanic. Citizenship status is also a binary variable indicating whether the youth was born in the United States. Place of residence indicates whether the youth's household resides in an urban or rural area. Mother's age at the youth's birth is the age of the youth's mother in years when the youth was born. Parents' education is measured as the highest grade completed by the more educated parent. Household size is the number of people living in the youth's household, while parental disruption is represented by an indicator variable equal to 1 if the youth lived with both biological parents until 14 and 0 otherwise. The index of family routines is reported by the NLSY97 and captures the degree of bond the youth has with family. The scores range from 0 to 28. Higher scores indicate more days spent in routine activities with the family.

The population per square miles, proportion of family below the poverty line, serious crime rate and median family income are reported in the geocode portion of the NLSY97. They are data for the counties where the youths lived at the interview date for each round. These statistics are based on the United States Census Bureau's county and city data. The population per square miles is the 1992 population to 1990 square miles ratio in the county of residence while the proportion of family below the poverty line is the 1989 proportion of families below the poverty line in the county of residence. Finally, the serious crime rate is the 1991 serious crime per 100,000 of the population in the county of residence, while the median family income is the 1989 median family income in actual dollars in the county of residence.

4. Results

We employ Ordinary Least squares (OLS) and fixed effects (FE) specification to estimate equation (1). We use the Durbin-Wu-Hausman test to determine whether a fixed or random effects model is appropriate. The null hypothesis for the test is that the appropriate model is the random effects model while the alterative hypothesis is that the appropriate model is the fixed effects model. Based on the test we reject the null hypothesis. This result is intuitive because it is likely that the unobservable characteristics within youths that affect criminal behavior over time are fixed and

not random. Using both OLS and FE models for the panel data is a standard routine (For example, see Azizi (2017); Azizi (2018); Azizi (2019a); Azizi (2019b); Chukwuma and Ekhator-Mobayode (2019); Ekhator-Mobayode and Abebe Asfaw (2019); He and Azizi (2019); Osell (2018a); Osell (2018b)) The OLS and FE results for each outcome variable are presented in Table 1.

Table 1: The Effect of Neighborhood Gang on Youth Criminal Behavior

Variables	(1) Delinquency	(2)	(3) Substance Use	(4)
	OLS	FE	OLS	FE
Gang	0.597***	0.126	0.406***	0.208**
	(0.121)	(0.163)	(0.080)	(0.101)
Age	5.014	2.623	14.619***	15.240***
	(7.888)	(8.362)	(5.169)	(5.180)
Age^2	-0.294	-0.121	-0.949***	-0.984***
	(0.521)	(0.522)	(0.341)	(0.342)
Age^3	0.005	0.002	0.020***	0.021***
	(0.011)	(0.012)	(0.007)	(0.007)
Gender	0.700***	-	0.158*	-
	(0.124)	-	(0.075)	-
Mothers age	-0.009	-	-0.001	-
	(0.008)	-	(0.005)	-
Hispanic	-0.117	-	-0.253*	-
	(0.209)	-	(0.137)	-
Black	-0.327	-	-0.565***	-
	(0.161)	-	(0.105)	-
American Indian	-0.067	-	-0.942**	-
	(0.707)	-	(0.463)	-
Asian	0.323	-	-1.207**	-
	(0.887)	-	(0.580)	-
Other	0.086	-	0.131	-
	(0.229)	-	(0.150)	-
Citizenship Status	0.284	-	0.326**	-
	(0.207)	-	(0.136)	-
Parental Disruption	0.008	-	-0.085	-
	(0.130)	-	(0.085)	-
Parents Education	-0.038	-	-0.012	-
	(0.025)	-	(0.016)	-
Household Income to Poverty Ratio	-0.020	0.035	-0.016	-0.022
	(0.025)	(0.036)	(0.016)	(0.022)
Household Size	0.096	0.250	0.070	-0.252
	(0.177)	(0.401)	(0.116)	(0.0248)
Urban	0.607**	-0.611	0.073	-0.199
	(0.293)	(0.866)	(0.192)	(0.537)
Index of Family	-0.067***	-0.039**	-0.044***	-0.034***
	(0.012)	(0.016)	(0.008)	(0.010)
Population per square miles	<0.0001	-0.014	<0.001	-0.010
	(<0.001)	(0.024)	(<0.001)	(0.015)
Proportion of Families Below Poverty	-0.002	0.019	-0.001	-0.080
	(0.002)	(0.208)	(0.001)	(0.129)
Serious Crime Rate	0.00003	0.001	0.000001	0.001
	(0.00004)	(0.005)	(0.00003)	(0.003)
Median Family Income	-0.00001	0.001	<0.001	-0.0002
	(0.00003)	(0.001)	(<0.001)	(0.001)
Urban * Proportion of Families Below Poverty	-0.001	0.006	0.001	0.001
	(0.002)	(0.006)	(0.001)	(0.003)
Population per square miles * Serious Crime Rate	<0.001	<0.001	<0.001	<0.001
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Household Size * Median Family Income	<0.001	<0.001	<0.001	<0.001
	(<0.001	(<0.001)	(<0.001)	(<0.001)
Constant	-24.775	-56.053	-73.029	-69.90
	(39.32)	(50.263)	(25.763)	(31.13)
Number of Observations	965	965	965	965
R^2 (within)	-	0.36	-	0.21
R^2 (between)	-	0.0001	-	0.001
R^2 (overall)	0.39	0.0001	0.31	0.0001
County Fixed Effects	Yes	Yes	Yes	Yes
MSA Fixed Effects	Yes	Yes	Yes	Yes
Survey Year Fixed Effects	Yes	Yes	Yes	Yes

The standard errors are reported in parentheses. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

Delinquency

The independent variables in the OLS model account for 39 percent of the variation in youth delinquency index score. The presence of neighborhood gangs, gender, urban, and index of family are statistically significant in the model. Being male, as opposed to being female, increases a youth's delinquency index score by 0.7 units, while living in an urban area as opposed to living in a rural area increases a youth's delinquency index score by 0.607 units. Also, an increase in the index of family by one unit decreases a youth's delinquency index score by 0.067. The OLS results provide evidence that the presence of neighborhood gangs has an effect on the incidences of delinquency among youths. The results suggest that at the 1% level of statistical significance, the presence of gangs in a youth's neighborhood increases the delinquency index score by 0.597 units.

The between R-squared is "how much of the variation between individuals does our model account for" and the within R-squared is "how much of the variation within individuals does our model account for" and the overall R-squared is a weighted average of these two. In the case of our paper, the fixed effect model only explains the variation within individuals and fails to explain variation between individuals.

Overall, the independent variables in the FE model account for 1 percent of the variation in the youth delinquency index score. Because this is a FE specification, the time invariant variables - gender, mother's age at youth's birth, ethnicity, race, citizenship status and parental disruption- are dropped from the analysis. Among the time-variant variables used in the analysis, only index of family is statistically significant. An increase in the index of family by one unit decreases a youth's delinquency index score by 0.067 units. The significant effect of the presence of neighborhood gangs in the OLS model is absent in the FE model. The findings suggest that after accounting for individual heterogeneity, the presence of neighborhood gangs has no statistically significant effect on youth delinquency.

Substance Use

The independent variables in the OLS model account for 31 percent of the variation in the youth substance use index score. The presence of neighborhood gangs, age, being male, Hispanic and black as well as citizenship status and the index of family are all statistically significant in the model. A one-year increase in age increases a youth's substance use index score by 14.6 units. However, this increases as a decreasing rate as a youth gets older. Being Hispanic as opposed to non-Hispanic reduces the substance use index by 0.253 units and being black as opposed to being white reduces a youth's substance use index score by 0.565 units while being born in the United States increases a youth's substance use index score by 0.326 units. Also, an increase in the index of family by one unit decreases a youth's substance use index score by 0.044. The OLS results for provide evidence that the presence of neighborhood gangs influences incidences of substance use

by youths. The findings suggest that at the 1% level of statistical significance, the presence of gangs in a youth's neighborhood increases the substance use index score by 0.406 units.

Overall, the independent variables in the FE model account for 0.01 percent of the variation in the youth delinquency index score. Because this is a FE specification, the time invariant variables - gender, mother's age at youth's birth, ethnicity, race, citizenship status and parental disruption - are dropped from the analysis. Among the time-variant variables used in the analysis, only age and index of family is statistically significant. A one-year increase in age increases a youth's substance use index score by 15.24 units. However, this increases as a decreasing rate as a youth gets older. An increase in the index of family by one unit decreases a youth's delinquency index score by 0.034 units. The significant effect of neighborhood gangs in the OLS model persists in the FE model. The evidence from the FE model suggests that the presence of gangs in a youth's neighborhood increases the substance use index by 0.208 units. The findings suggest that after accounting for individual heterogeneity, the presence of neighborhood gangs has a statistically significant effect on incidences of substance use by youths.

5. Conclusion

This study provides evidence that the presence of gangs in a youth's neighborhood affects incidences of substance use of youths after accounting for individual heterogeneity. The findings suggest that policies providing early guidance to youths about the effects of neighborhood gangs should be encouraged. Youths exposed to neighborhood gangs should be sensitized on the dangers of substance use. This can include educating these youths about the harmful effects of drugs and incentivizing them to pursue paths free from substance use. It is important to know the channel through which the presence of neighborhood gang impact youth criminal behavior since early years a time of great opportunity and youths are also vulnerable during this time. Abraham Maslow's hierarchy of needs can be used to explain a channel through which the presence of neighborhood gang can impact youth criminal behavior. According to this theory, in order to reach self-actualization, physiological, safety, social belonging and esteem needs must be met. For youths, the family (the smallest social institution) is often the first place to seek physiological, safety, social belonging and esteem needs. However, if this becomes lacking in the family, youths may look up to other social institutions (such as gangs) in the neighborhood (in this context, the neighborhood can be viewed as a larger family and youths do not need to explicitly be gang members). Thus, one way to explore this mechanism is to explore the perception of needy youth (youths who lack supportive families) towards neighborhood gangs and subsequently perception of gang related activities. However, our paper does not focus on exploring these mechanisms, rather our goal is to explore any associations between youth criminal behavior and neighborhood gang.

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