

EXAMINING THE RELATIONSHIP BETWEEN SCHOOL PERFORMANCE AND
FIRST ARREST OF ADOLESCENTS

by

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ABSTRACT

EXAMINING THE RELATIONSHIP BETWEEN SCHOOL PERFORMANCE AND FIRST ARREST OF ADOLESCENTS

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Growing numbers of districts employ school resource officers to patrol school hallways, often with little or no training in working with youth (ALCU, 2009). As a result, children are far more likely to be subject to school-based arrests—the majority of which are for nonviolent offenses, such as disruptive behavior—than they were a generation ago (ALCU, 2009). Measures of delinquency are vast, and this paper uses a first arrest event as a proxy measure for delinquency in the age of reliance on School-Resource Officers rather than teacher and administrators for disciplinary purposes. The effects of first arrest on school performance, measured as GPA and graduation status are examined in this paper.

CHAPTER ONE

INTRODUCTION & STATEMENT OF PROBLEM

One of the most consistent findings in the juvenile delinquency literature is the relationship between school outcomes and criminal justice system involvement. Schools have been long criticized for contributing to delinquency in ways that include failing to prepare youth for responsible adult roles, labeling children negatively, suspending and expelling problem students, and for doing nothing about crime and delinquency within schools (Wenk, 1975). Research shows that this relationship occurs at relatively young ages, ages during which youth spend a significant amount of their time in the school community (Farrington et al., 1990; Roque & Paternoster, 2011; Katsiyannis, Thompson, Barrett and Kingree, 2012). While it is commonly agreed in criminology research that school experiences relate to delinquency, the exact direction of the school-delinquency relationship is unclear (Lawrence, 1991). For example, does delinquency or poor grades manifest first within a youth? Scholars have yet to fully understand the complex intervening variables between school performance and delinquent involvement, such as neighborhood and school level factors, and do not agree on the causal order by which school problems lead to delinquency. As such, the school-delinquency relationship deserves closer examination (Lawrence, 1991).

This paper adds to the literature on the causal link between delinquency and school performance by analyzing a definitive direction of this relationship. Examining students' first arrest and their later school performance problems may yield some additional answers by providing an analysis of outcomes for a youth's first arrest. The proposed work considers how a first arrest impacts school performance defined as grade point average (GPA), and graduation rate.

While prior research considers the effects of school performance and success on delinquency, less work explores how these first delinquent events impact school performance after the event (Hirschfield, 2009). Looking at the issue of juvenile delinquency from a perspective different than the one that assumes academic failure prefaces delinquency and justice involvement is important as it may suggest there is not a one-size-fits all process to involvement in delinquency. Hirschfield (2009, p.384) concluded that "official intervention weakens participation in school in the inner city and, by extension, the social mobility and control potential of educational institutions" therefore limiting academic success (graduation and high GPA).

To fill this gap, **the proposed project explores the relationship between school performance (GPA, diploma) and first arrest by considering how a first arrest impacts future educational performance outcomes (GPA, diploma)**. Rather than replicating past studies, this research explores the causal link between delinquency and school performance by looking at one direction of this relationship. The work will use the National Longitudinal Study of Adolescent Health (Add Health) to assess the relationship

between the age of first arrest of individuals and their academic performance, defined as GPA, and receipt of diploma.

CHAPTER TWO

REVIEW OF LITERATURE: SCHOOL PUNISHMENT & YOUTH TRAJECTORIES

Problems facing youth in society

Over the last two decades, a new emphasis in criminology details the importance of exploring the causes of crime and delinquency and the effects of such behavior (Hagan 1993; Jessor, Donovan, and Costa 1993; Laub and Sampson 1993). This work explores questions regarding the impact of crime and delinquency on individual life course trajectories. Additionally, criminologists consider the relationship between adolescent delinquency and educational attainment (Monk-Turner 1989; Hagan 1991, 1993, 1997; Kaestner 1991; Freeman 1992, 1995; Gill and Michaels 1992; Jessor, Donovan, and Costa 1993; Sampson and Laub 1997; Bushway 1998; De Li 1999; Tanner, Davies, and O'Grady 1999). These results support the idea that adolescent delinquency is a significant factor in determining outcomes such as number of years of school completed and level of occupational prestige (Hannon, 2002).

School-to-Prison Pipeline

The link between school and crime becomes even more relevant given the recent trend of the school-to-prison pipeline. The U.S. educational system recently moved towards a zero-tolerance policy of school discipline in which schools respond more

aggressively to misbehavior than in the past (Kupchik, 2010). Zero-tolerance policies mean that schools across the country look at every situation as the same and often administer the same aggressive and harsh punishment in every circumstance (Kupchik, 2010). This new disciplinary tactic encourages schools to use surveillance cameras, security guards, and police officers in regular school day functions. Naive misconceptions of these policies suggest that zero-tolerance school discipline will help reduce crime and violence within schools. The reality is that students are now arrested for school disciplinary infractions, whereas in the past, these same infractions might earn detention. Most importantly, the full effects of these new disciplinary procedures on students' futures is unstudied.

Despite the research concerning the link between school performance and delinquency, little scholarship examines the effects of first arrest on academic performance and trajectories. This link between delinquency and schools is commonly referred to as the "school-to-prison pipeline" (Kupchik, 2010). This school-to-prison pipeline developed over time as the result of zero-tolerance policies, (Hirschfield, 2008), which includes the over-reliance on police officers in school disciplinary affairs, harsher punishments for school misbehavior, and newer forms of surveillance within schools that include cameras and metal detectors (Kupchik, 2010). Additionally, the criminalization of school discipline extends into the juvenile court (Hirschfield, 2008). Data from several jurisdictions (see Rimer, 2004; Graves, 2004) on the offenses that schools now refer to juvenile court exhibit that the youths' misconduct leading to court referral is typically minor in classification (Hirschfield, 2008). This new nature of the relationship reflects

increased collaboration between schools and the juvenile justice system, suggesting that traditional and historically held boundaries between the two institutions have been altered as a result of these zero-tolerance policies. The collaborative relationship between educational and law enforcement agencies progressed so that information-sharing agreements between the two agencies allows for laws that permit schools across jurisdictions to expel students for outside legal entanglements (Bickerstaff et al., 1997; Spielman and Rossi, 1997; Brooks et al., 1999). Because of the increase in number of offenses that youths find themselves being arrested for due to these policies, it is increasingly important to understand how the event of arrest affects the trajectories of student's academic careers.

Kupchik (2010) posits that involvement with school punishment and security shapes their relationship with formal social control actors outside of school, such as the criminal justice system. Likewise, Wacquant (2001) observes that “the main purpose of the school is simply to ‘neutralize’ youth considered unworthy and unruly by holding them under lock for the day so that, at minimum, they do not engage in street crime.” The effects of these policies include the ability for schools to sort and label certain students as criminals, and putting students at risk of unnecessary punishment. With zero-tolerance policies, it appears that many school disciplinary cases are now becoming criminal justice cases, and often times, many students' first interaction and/or arrest with the system. In his book, *Getting Paid*, Sullivan (1989), writes:

Because the educational process is sequentially structured and much of the institutional structure of education is age-graded, disruptions resulting from

secure confinement are often severe. This is especially true through the completion of secondary education. Once a young person is thrown off-track from completing a high school degree, getting back on track is difficult. Motivation and access to high-quality instruction matter, of course, but negotiating the institutional structure becomes a salient additional obstacle. Young people returning from secure confinement are caught between normative expectations that they attend school and barriers to reentry posed by the structure of the educational institutions, (p. 60).

A disruption in the educational progress of a youth can occur in the form of arrest or incarceration. In the case of incarceration, youth can be removed for periods of time from mainstream education. However, the effects of a first arrest are much less researched while the process can include a temporary removal from school, coupled with the stigma of having a criminal record, and the label within the school community as a “problem”.

The School-Crime Nexus

Extensive research considers individual and contextual risk factors and developmental trajectories that may lead to dropout among urban high school youth. Limited research explores the link between criminal justice system involvement and school dropout. In one study, Hirschfield (2009) suggests the reason for this oversight may stem from the link between delinquency, substance use and dropout. Extensive research has been done on the link between substance use and dropout and scholars have historically coupled the definitions of delinquency and substance use in juveniles. He also notes substance use and dropouts have been studied extensively, and involvement in the

criminal justice system is potentially trapped in those definitions. This has implications suggesting that the true nature of the school-delinquency relationship has not been unpacked on a level to fully understand the causes and implications of such a relationship.

The majority of court-involved youth experience academic failure, school exclusion, and dropout (Christle, Jolivet, and Nelson, 2005; Kirk & Sampson, 2013). Extensive research contends that youth who experience academic failure and exhibit a low commitment to school are at increased risk of engaging in violent behavior (Dahlberg, 1998; Archwamety & Katsunuyannis, 1998; Erickson et al., 2000; Lewin, Davis & Hops, 1999). In their meta-analysis of studies involving youth delinquency, Maguin and Loeber (1996) find that low school achievement predicts delinquency. As explained in Archembault et al. (2009), student engagement originates in part from Hirshi's Social Control Theory (1969). This theory places a great deal of emphasis on individual feelings of attachment and belongingness to social institutions. It suggests that disengagement may emerge from a weakened relationship between the individual and educational institutions (Archembault, 2009). Additionally, the Finn (1989) participation-identification model of school withdrawal considers the construct of student engagement. Here, engagement is defined by identification and participation at school. Identification refers to a sense of belongingness and the perceived worth of schooling.

There are several theoretical reasons to expect that delinquency has consequences for educational success. These include social control, and labeling theories. Rational choice theory suggests that students may drop out of school or opt not to enter college

following delinquency because they decide the benefits of education will not be worth it, given the stigma of a criminal record (Kirk & Sampson, 2013).

Most theoretical discussions of the impact of official sanctions on educational outcomes center around the labeling framework (Bernburg and Krohn 2003; Sweeten 2006; Hirschfield, 2009). Labeling theory assumes that individuals are given labels in society and their actions manifest in accordance with those labels (Braithwaite, 1989). Therefore, a person might be labeled a deviant or criminal by their associations and because of that label they feel they are unable to break, they engage in criminality. Braithwaite (1989) added a reintegrative shaming aspect to labeling theory by positing that society reacts to criminal acts by expressing disapproval of the act and the person in an attempt to shame the individual out of future criminality. A large body of policy work has evolved from this theory as restorative justice. The idea is based on welcoming an offender back into the community by trying to correct the harm done to the victim (community) and by building attachments of the criminal in the community (Braithwaite, 1989).

Further, the literature on labeling theory, specifically with criminally-involved individuals, posits that legal sanctions are an important influence on school dropout in the inner city, independent of problem behaviors (Hirschfield, 2009). A different version of labeling theory contends that official sanctions, such as arrest, lead to further deviance through limitations in conventional opportunities. In such cases, zero-tolerance policies may be triggered which require the student to be expelled from school, or educational progress could be interrupted while the youth navigates the juvenile justice system

without consistent educational support. Finally, delinquency, arrest, and/or court involvement may put youths in close contact with other delinquent youths who may encourage further delinquency, less attachment to high school, and lead to poorer educational outcomes (Sweeten, 2006). In the interest of school safety, students with criminal records, or a history of delinquency, may be pushed out of mainstream high school through exclusionary policies, and they may be segregated into specialized programs for problem youth (Kirk and Sampson 2011). Additionally, theorists suggest that labels stemming from legal involvement inhibit positive identification with the student role and hence with pro-social peers and school authorities (Bernburg and Krohn 2003; Kaplan and Liu 1994; Hirschfield, 2009). For example, many public schools districts, including Chicago since 1997, can legally exclude youths who are arrested off-campus or are released from secure confinement from participation in school and educational activities (Hirschfield 2008; Mayer 2005). Exclusionary reactions by teachers and administrators often alienate delinquents from conventional peers, norms, and opportunities (Sampson and Laub 1997; Hirschfield, 2009). Delinquency may also reduce chances for high school graduation and college enrollment because time spent in court, in juvenile detention, or reporting to a probation officer leads to absences, a blemished transcript, and an unstable educational career (Kirk & Sampson, 2013).

Of course, this is not just limited to arrests; additional criminological theories discuss other effects of sanctions on behavior within the schools. For example, defiance theory posits that negative sanctions of deviant acts within the school, when perceived as unfair or disrespectful, may provoke anger (Jordan, Lara, and McPartland 1996; Myers et

al. 1987; Tanner et al. 1999). Therefore, certain sanctions may also isolate youths from sources of social support, advocacy, and monitoring (Crowder and South 2003; Teachman, Paasch, and Carver 1996; White and Kaufman 1997; Hirschfield, 2009).

Five studies assessed the impact of juvenile arrests or court involvement on high school completion. Four found a reliable adverse impact overall (Bernburg and Krohn 2003; De Li 1999; Hjalmarsson 2008; Sweeten 2006), while the other found adverse effects only among “nonpoor” youths (Hannon 2003). One criticism of these previous studies is that these did not sample students from U.S. central cities, where delinquency, and dropout are prevalent, and exclusionary reactions to delinquency are most likely (Birnbaum 2001; Feld 1991; Sampson and Laub 1997; Sullivan 1989). As a result, most previous studies include a small number of students who experienced intensive involvement with the juvenile justice system or severe sanctions, limiting the generalizability of the results. Despite the limitations, prior research concludes that a first-time court appearance during high school is more detrimental for educational outcomes than a first-time arrest without a court appearance. However, this relationship depends on the causal link between official sanctions and educational achievement (Sweeten, 2006). Labeling theory suggests that official sanctions stigmatize youth within schools. Sweeten (2006) posits it would seem likely that both arrest and court involvement would stigmatize youth, triggering labeling effects, if in fact this theory was the correct explanation of one type of school-crime relationship.

Importantly, Sweeten (2006) concludes that first-time court appearances during high school increase the chance of dropping out of high school. Additionally, the effect of

arrest and court appearance is particularly detrimental to less delinquent youths than those who are frequently involved in a delinquent lifestyle (Sweeten, 2006). A meta-analysis by Maguin and Loeber (1996) suggests that exclusionary discipline practices within schools, such as suspension, interfere with the educational progress and perpetuate a failure cycle, decreasing the opportunities to gain academic skills and appropriate social behaviors (Costenbader & Markson, 1998). If this holds true for suspensions, then it should also hold true to other punitive actions which remove a youth from the learning cycle for a period of time, such as an arrest. It is important to note the considerable evidence suggests that males and ethnic minority youth may be disproportionately more likely to receive school punishment (Aud et al. 2011; Skiba et al. 2002), but the non-significant race and ethnicity and sex interactions suggest that regardless of race or ethnicity or sex, school suspension or expulsion increases the likelihood of arrest. Thus, while school disciplinary action may be differentially administered to youth based on race or ethnicity and sex, once it is administered, the consequences of increased likelihood of arrest appear to be universal.

Therefore, the primary research question here is *does an arrest event impact certain identified school performance measures?* An expanded version of this research question states that, *if a significant association between first arrest and any of the selected future school performance measure emerges, does the relationship persist after controlling for demographics?*

Hypotheses

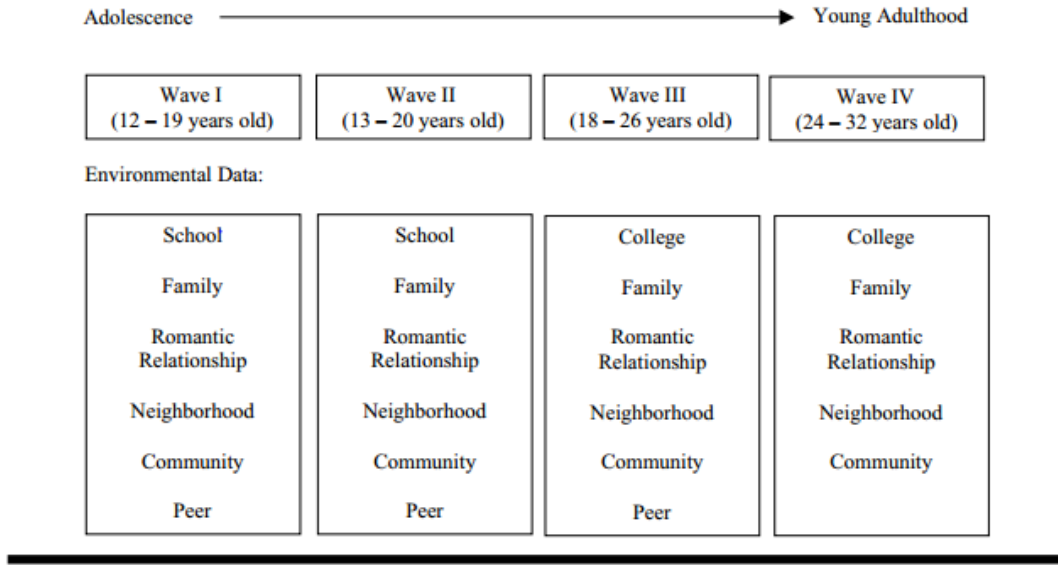
This research project will test the following identified hypothesis.

Hypothesis 1: Youth with arrest events will experience poorer academic performance compared to those who had no arrest. After controlling for demographics, a first arrest event will still negatively affect school performance measures.

CHAPTER THREE

RESEARCH METHODS

The National Longitudinal Study of Adolescent Health (Add Health) is a longitudinal study of youth enrolled in 7th through 12th grades during the 1994 -1995 academic year. From 1994-2010 the Add Health Study was funded by three Program Projects under the National Institutes of Child Health and Human Development with co-funding from 17 additional federal agencies (Chantala, 2006). The Add Health data collection sought to understand the causes of health and health behavior among adolescents with a specific emphasis on the contexts of adolescent life, including family, school and peers. The data include independent measures of the social environments of the adolescents including family, neighborhood, community, school, friendship and romantic relationships (Harris et al., 2006). Four waves of in-home interviews followed the in-school survey, when the sample population was between ages 24 and 32 (Harris et al., 2006). The Add Health data includes measures of school performance and age of first arrest, making it an appropriate dataset for this study.



(Adapted from Harris et al., 2006)

Figure 1: Add Health Longitudinal Design (figure from image file)

The first wave of data was the In-School Survey conducted in 1994. All students in attendance on the day of interview completed a questionnaire. Wave I’s in-home survey from 1995, selected adolescents from the 1994-1995 enrollment rosters for the schools. The Wave II in-home survey from 1996 includes participants from Wave I “excluding adolescents in 12th grade at Wave I interview who were not part of the genetic sample. The number of respondents in Wave II increased due to the inclusion of some adolescents not interviewed at Wave I (Chantala, 2006). The Wave III In-Home Survey of 2001 includes participants from Wave I in-home Survey and participants interviewed only at Wave II, if they were part of the genetic sample (Chantala, 2006). Researchers conducted a fourth in-home interview in 2008 as Wave IV of the study with the original

Wave I respondents. The Wave IV study is a follow-up of the nationally representative sample of adolescents first interviewed in 1994 and 1995 (Harris 2013).

The current study utilizes Wave III data which collected High School Transcript Release Forms. Harris (2013) explained that the fundamental purpose of the third follow-up survey was to understand the link between what happens in adolescence and what happens in the transition to adulthood when adolescents begin to negotiate the social world and develop their expectations and goals for the future, making it an acceptable dataset to use for the scope of this study. The in-home Wave III sample consists of Wave I respondents who could be located and re-interviewed at the time of survey administration. This wave was selected for the study due to the inclusion of official school transcripts, as well as demographic and arrest history information. All data needed for the current study was included in Wave III data without having to code and/or merge any files, making it the most suitable choice. Wave III data collection occurred between August 2001 and April 2002. Respondents were aged 18-26. 15,170 respondents completed Add Health interviews resulting in a 76% response rate.

Current Dataset

This study examines the effect of first arrest on educational outcomes, GPA and graduation status. Add Health data were used to complete this study, and a series of statistical tests were used to analyze this hypothesized change.

The present study examines educational outcomes between those who do and do not experience arrest before they graduated high school. Individuals included in the

analyses must meet the following minimum criteria: have answered yes or no to whether or not they had ever been arrested before.

The variables included in the dataset used in the included analyses are: age at survey, white-yes/no, black-yes/no, other-yes/no, age when first arrested, overall GPA year 1, overall GPA year 2, overall GPA year 3, overall GPA year 4, cumulative GPA, and diploma status.

In order for this dataset to be ready for analysis, data cleaning needed to be completed. First, all of those who did not fit the above stated qualifications were excluded from the dataset. Then, variables were recoded in ways that made the dataset suitable for analysis. Due to the nature of the data, questions have a “did not answer” and “legitimate skip” response option. In each instance of a variable, only those who answered “yes” or “no” definitively were used, and those who did not answer or were marked as “legitimate skip” were excluded. Gender and race variables are binary in nature. For the “White” variable 1=yes they are white and 0=no they are not white. This same rule applies for “black” and “other”. Diploma status was created out of a variable originally labeled “high school exit status.” The responses to this question were, “standard diploma,” “honors diploma,” “Special education diploma,” “still enrolled,” “drop out,” “other non-graduate,” “certificate of completion,” “graduate equivalency diploma,” and “no exit status recorded on transcript.” “Standard Diploma,” “honors Diploma”, “Special education diploma,” “certificate of completion” and “graduate equivalency diploma” were recoded as 1, indicating that they received a diploma. If respondents reported, “drop out” or “other non-graduate” they were recoded as 0,

indicating an absence of high school diploma. Additionally, to ensure all data are in working form, missing data were recoded as missing, and string variables were converted to numerical values, appropriately.

During the analysis phase, it was discovered that many students did not have a 5th and 6th year GPA, representing 11th and 12th grade. For quality control purposes, data were coded case by case to understand why the majority of students did not have a 5th or 6th year GPA. In doing this, the 5th and 6th year GPA's represented cases in which students were in high school longer than 4 years. Therefore cases were individually coded to include a GPA from 9th through 12th grade, representing GPA1 through GPA4 in the dataset. This determination was made to ensure that the majority of the sample had all four data points and were able to be used in the sample and analysis.

Because of the models used for this analysis, further data coding was needed to code binary variables for whether or not a respondent had an arrest during a certain year (variable=arrest). If a respondent had an arrest during a school year, that respondent was coded as one. Additional coding was needed to compute the variable PRIORARREST so that once a respondent had an arrest; all future PRIORARREST would also equal 1. The data were then reshaped from a wide form into long form in STATA so that each year of school for each respondent was a line in the data. This allows the data to be in a condition to allow for Growth Curve Modeling.

Measures

Dependent Variables:

Grade Point Average (GPA)

GPA is an official measure taken from education data in the ADD Health Datasets and includes an overall cumulative GPA for individuals.

High School Diploma

Whether or not a respondent received their high school diploma is a binary measure of yes (1) or no (0) indicating whether a person has received a high school diploma.

Independent Variables

Arrest

Arrest is a binary variable used as the main independent variable. Arrest is a variable coded 0 or 1 for each year in high school. If an individual had an arrest in 10th grade, their arrest variables would be coded as (0, 1, 1, 1). This variable was coded by using the year of arrest and corresponding years in school to show which year of schooling they were arrested.

Control Variables

This study includes other independent variables in the model as control variables. Age, gender, and race/ethnicity all may have an impact on a youths experience with arrest and education and these become necessary controls. In addition, these factors may be related to educational achievement. Gender is a binary variable indicating whether the respondent is male or female. Race is assessed with a binary variable that uses white respondents as the reference group that indicate whether or not the respondent is a race other than white (Black, Asian, American Indian or Alaskan Native, Native Hawaiian or Pacific Islander, other, or mixed race). For ethnicity, a binary variable denotes whether

the respondent is of Hispanic, Latino, or Spanish origin (race and ethnicity were asked about in separate questions), or not of Hispanic origin. A measure of ethnicity was used in preliminary models, but due to a low number of respondents, the variable excluded too many respondents in the sample, so it was not included in the final models.

Analytical Method

Prior to any modeling, descriptive statistics, including frequency distributions, will provide a quick picture of the population being studied. These will include the distributions of variables such as age of first arrest, diploma reception, age, gender, and race. Appropriate measures of central tendency for relevant variables were also generated.

Table 1 Categorical Variables

Variable	Frequency	Percent
Sex		
Male	539	70.09
Female	230	29.91
Race*		
White	528	68.93
Black	161	20.96
Other	75	9.78
Received Diploma		
Yes	660	86.5
No	103	13.5
Ever Arrested		
Yes	427	55.53
No	342	44.47
*Black was given priority other white and other in multiple selection cases, other was given priority over white in multiple selection categories		

Table 1 displays descriptive statistics for categorical variables in the sample. The total sample size here is 769. Of that sample population, 70% are male, 69% identify as white, and 86.5% received their high school diploma. Additionally, 55% of this population indicated that they had previously been arrested.

Table 2 Interval Variables

Variable	Mean	SD	Minimum	Maximum
Age at Survey (N=769)	21.63	1.8	18	27
Cumulative GPA*(N=761)	2.4	.86	0	4
Age of First Arrest[^]	18.05	2.65	10	25
*8 missing GPA				
[^] 422 recorded an arrest at time of survey				

Table 2 displays descriptive statistics for interval level variables that are pertinent to this study. The mean age for the sample population is 21.6 years, and the mean age of first arrest is 18.

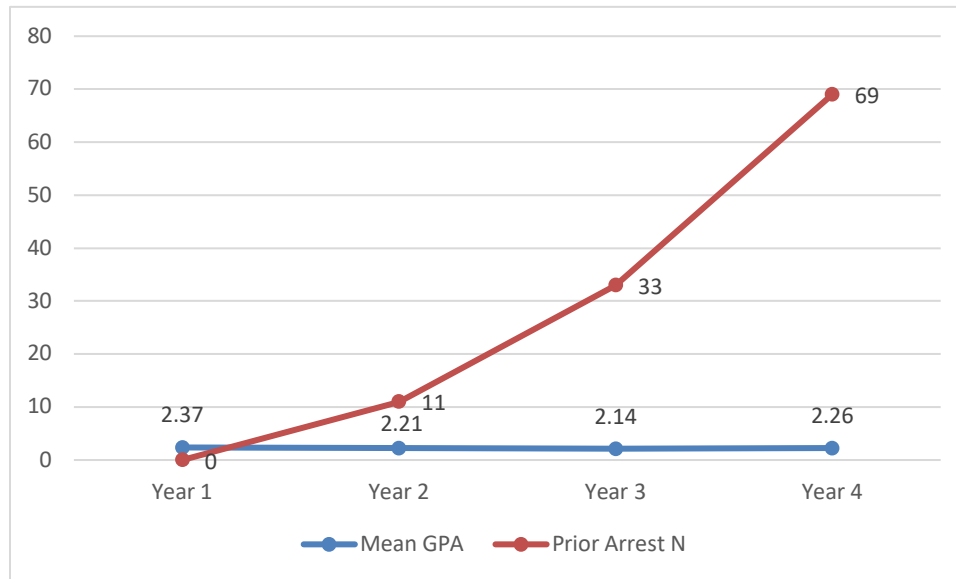


Figure 2 Mean GPA and Arrest Over Time

Figure 2 (above) displays the mean distribution of GPA per year and the total number of subjects with an arrest. During year 1, the average GPA was 2.37 and there was 0 subjects who experienced an arrest. During year 2, the average GPA was 2.21 and 11 subjects experienced an arrest. Between year 3 and 4, 36 additional subject experienced an arrest, however, the average GPA increased by 0.12 points.

Table 3 Mean GPA By Year and Arrest Status

	No Arrest		Arrest	
	GPA	N	GPA	N
Year 1	2.37	108	NA	NA
Year 2	2.23	94	2.04	13
Year 3	2.14	72	2.17	33
Year 4	2.34	37	2.22	66

Table 3 (above) displays the distribution of mean GPA over year, based on arrest status. The distribution in years 2 and 4 are expected based on the hypothesis presented in this paper, however, year 3 defies the proposed hypothesis.

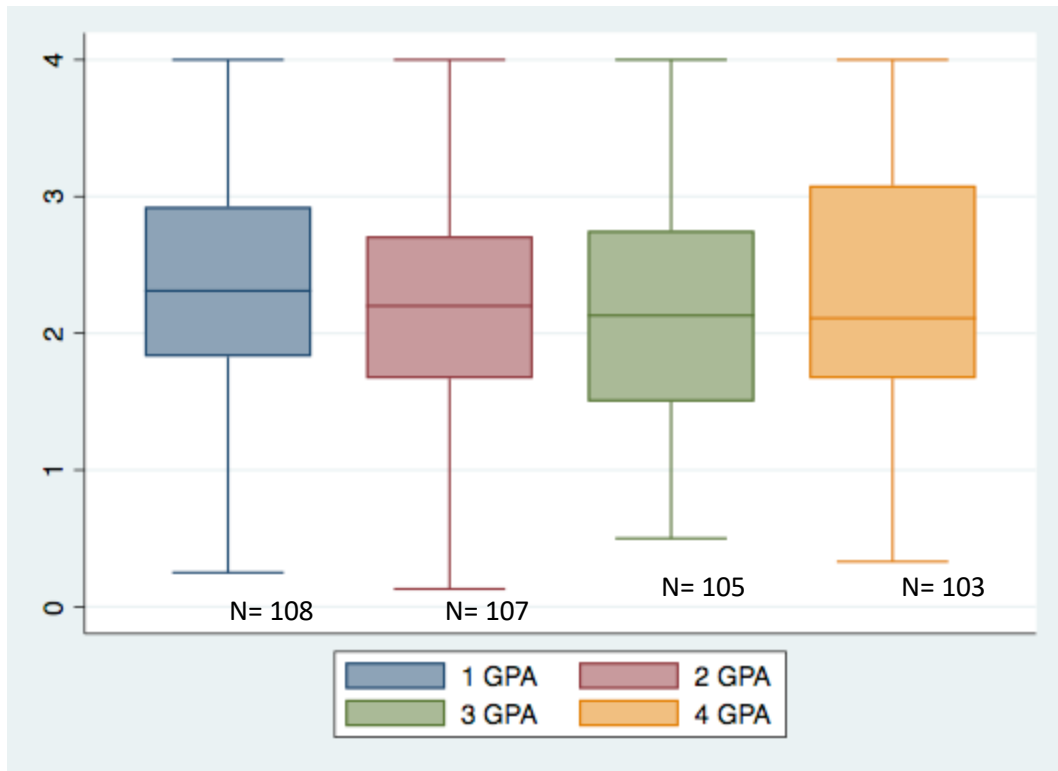


Figure 3 Mean GPA Distribution

Figure 3 (above) displays the distributions of GPA over the four years that it was tracked for this study.

Table 4 Two way relationships with Arrest

Variable	Percent	Chi-Square
Sex		19.289**

Male	76.58
Female	23.42
Race	20.07**
White	66.20
Black	23.71
Other	9.62
Received Diploma	23.55**
Yes	81.13
No	18.87

Table 4 displays two-way relationships (Chi-square) with arrest. In the study sample, there is a significant positive relationship between gender and arrest, identifying as white and arrest, and receiving a high school diploma.

Table 5 T-Tests with Arrest

Variable	Arrest - Yes			Arrest- No			T-Statistic
	Mean	SD	N	Mean	SD	N	T
Cumulative GPA	2.177	.869	421	2.679	.769	340	8.34**

Similarly, Table 5 displays the t-tests of interval-type variables and arrest. There is a significant positive relationship with cumulative GPA and arrest.

Growth Curve Modeling

As previously stated, this study utilizes growth curve modeling. Growth curve modeling is a type of panel data in which a sample of subjects is observed at more than one point in time, making this type of analysis appropriate for the Add Health study

design and data collection methods. This type of modeling has been used in academic research previously, and proves to be the best method for the research question.

In growth curve modeling, all subjects in a given population are assumed to have developmental curves of the same functional form (e.g., all linear), but the parameters describing their curves may differ. With linear developmental curves, for example, there may be individual differences in the initial level as well as in the growth rate or rate of change. Growth curve analysis is a statistical technique to estimate these parameters (Hox and Stoel, 2005). Growth curve analysis main emphasis lies in explaining variability between subjects in the parameters that describe their growth curves (Willet and Sayer, 1994). Latent growth modeling has emerged as the preferred analytical choice in criminology due to the nature of data and common outcome variables. This preference is due to the fact that growth curve modeling is more flexible than repeated measures analysis of variance or observed change score analysis in dealing with missing data, unequally spaced time points, complex nonlinear developments, and, non-normally distributed measures (Curran et al. 2010).

The model on which growth curve analysis is based, can be approached from several perspectives. On the one hand, the model can be constructed as a standard two-level multilevel regression model. The repeated measures are positioned at the lowest level (level-1 or the occasion level), and are then treated as nested within the individuals (level-2 or the individual level), the same way as a standard cross-sectional multilevel model treats children as being nested within classes. Therefore, for the purpose of this

study, each observation of GPA for a year is the first level, and the individual becomes the second level (Hox and Stoel, 2005).

Models

1. Growth Curve modeling determines the effect of an arrest over time on the dependent variable of GPA.
2. A logistic regression model examines the effects of the independent variables on the categorical variable of graduation.

Results

Table 6 Latent Curve Modeling

GPA Over Time Group N = 761									
Variable	Base Model (B)	Std. Error	CI Lower	CI Higher	Exp. Model	Std. Error	CI Lower	CI Higher	
Fixed Effects									
Prior Arrest	.026	0.068	-0.107	0.159	.025	0.067	-0.11	0.18	
Male	--	--	--	--	.34	0.066	0.21	0.47	
Black	--	--	--	--	-.50	0.075	-0.655	-0.36	
Hispanic	--	--	--	--	-.16	0.097	-0.57	-0.20	
Random Effects									
Intercept	.8				.74				
Year	.14				.14				
SE	.01				.01				
Number of observations		2,901				2,901			
Degrees of Freedom		5				5			
Wald Chi2		0.15				95.07			

The linear growth curve model is shown in the above table. STATA was used to perform a linear mixed effects analysis of the relationship between first arrest and school performance (GPA). I assume that factors and covariates have a linear relationship to my dependent variables, therefore the growth curve model was the best fit because there are multiple time observations that would create a non-linear relationship. Unfortunately, this model does not explain change in GPA over time, suggesting that prior arrest had little (.026) to no effect on this population for GPA change over time in the base model and (.025) in the expanded model. The standard deviation of the random coefficient on GPA is 0.138 (95% CI: 0.118, 0.161) which doesn't include 0, so there is minimal evidence of an effect of arrest on GPA over time. Also, the estimated standard deviation of the error term has stayed consistent at (.44). Based on the expanded model presented, being

female had a strong positive effect on GPA change over time (.34), and being black had a strong negative effect on GPA change overtime (-.5). Therefore, I can conclude that regardless of arrest, females will have a .34-point higher GPA than males and black individuals experience a -.5-point drop in their GPA. Overall, the covariates added little to the equation, and did not explain more of the variance in GPA over time than prior arrest explained.

Logistic Regression

Table 7 Logistic Regression

	Base model		Expanded model	
	Odds Ratio	SE	Odds Ratio	SE
Prior arrest	--	--	.575	.17
Gender				
Female	.42**	.131	.387**	.121
Race				
Black	1.01	.31	1.01	.31
Other	.67	.32	.68	.323
Hispanic	.74	.29	.697	.27
Cumulative GPA	8.8	11.8**	8.46**	1.75
Pseudo R2	.342		.348	
Chi2 (df)	201.7(5)		205.16(6)	
Significance of Chi2	0.00		0.00	
N of observations	752		752	

Table 7 displays the results of the logistic regression concluding that if you are a female, you are 2.6 times the odds more likely to have a high school diploma than males. Additionally, those individuals identified as another race recorded 1.67 times the odds ratio and Hispanic as 1.45 times the odds ratio than those identified as white to have a

high school diploma. However, these results are not significant. Those individuals identifying as black are less likely to receive a high school diploma, at an insignificant level, as well. Compared to those who have a lower cumulative GPA, respondents with higher cumulative GPAs are almost eight times more likely to have a high school diploma.

The expanded model includes the effects of being arrested on having a high school diploma. When adding the additional variables, the largest change in base variable impact is seen in those who are female. Compared with the base model (58%) of those who are female compared to those who are male, are 62% times less likely to have a high school diploma.

Overall, by adding the arrest variable, this model increases the R's in the base model by 0.6%. In conclusion, the additional variables in the expanded model very minimally increased understanding of the variation between individuals who earn a high school diploma who have been previously arrested.

CHAPTER FOUR

LIMITATIONS

There are several limitations in this study concerning the utilization of data. First, the Add Health data includes unique twin data that was unable to be utilized in this study. However, a further examination of twin data with this research question might yield more distinct results given prior literature supporting twin studies.

Additionally, prior arrest was used as a measure of delinquency because this was available in the Add Health data; however, this is not the most accurate portrayal of the first act of delinquency. Alternatively, this study may have been better served with self-reported delinquency measures rather than the measure of first arrest used here.

Due to the way in which the data were collected and organized for the Add Health study, it is impossible to pinpoint a first arrest date to the month that it occurred. This allows for a small margin of error in attributing the change in GPA during the school year due to the prior arrest or another event that could have happened during the same school year. Therefore, data that are able to pinpoint a month of first arrest as well as a year of first arrest would be better suited to understand the true temporal link between prior arrest and GPA.

The mean age of first arrest for the original study sample is 18.05, which is assumed to be around the age of graduation. There were instances in the data of the first

arrest happening after graduation which excluded subject from having a prior arrest to impact GPA in the statistical model. The overall statistical power for this study is relatively low due to the number of subjects who maintained a GPA throughout the course of 4 years in the data. Therefore, this study would benefit, and increase its power, with a larger number of participants who recorded a yearly GPA and an arrest before the age of 18, the expected year of graduation.

The analysis here does not include school level factors, nor does it control or account for school level variables that would impact the analysis. Therefore, my model imposes a structure on the individuals and data used in this study that potentially does not fit reality. This study does not take the complex structure of the individuals or schools into account.

Lastly, the data were collected without the knowledge of School-Resource Officers within schools so that the data cannot support any conversation or evidence about a temporal link between arrests as a result of the school-to-prison pipeline and zero-tolerance policies. Rather, the understanding of the impact of an arrest on school performance measures adds a layer of understanding to the larger conversation about the school-delinquency link.

CHAPTER FIVE

DISCUSSION

The study presented here examines the impact of first arrest on GPA and high school diploma. Building on earlier work focused on the school-crime relationship, I used Add Health data to produce a growth curve model and a linear regression to measure the effect of a first arrest on school outcome measures. Overall, the results from this study show that there is no support for the hypothesis that an arrest has a negative impact on GPA over time. However, there are promising results indicating that an arrest does impact whether or not one receives a diploma, based on certain individual characteristics. It is possible that this project would be better suited with data from a self-reported arrest survey (Monahan et al., 2014), that includes control characteristics that look at the family (Sampson and Laub, 1994) and socioeconomic status (Hannon, 2003) of the individuals environment. Implications of first arrest on school outcomes are discussed below.

Implications for School Outcomes

The OJJDP (2006) reports that almost five of every 100 persons enrolled in high school in October 1999 left school before October 2000 without successfully completing a high school program. This equates to about 488,000 youth dropouts. If educational failure leads to unemployment and if educational failure and unemployment relate to law-violating behavior, then patterns of educational failure over time and within specific

social class groups may help to explain patterns of delinquent behavior (OJJDP, 2006). Future research should follow up with studies that examine the effects of the school-to-prison pipeline on educational attainments of individuals to better understand the impact of the casual order of educational failure and delinquency. To do this, data that utilizes measures of no-tolerance policies be beneficial for explaining school outcomes for students who were previously not involved in the justice system.

The results of this study suggest that research needs to extend beyond the basic measures of first arrest and GPA to further explore the potential impact of arrest on academic outcomes. While GPA and obtaining a diploma were used in this study, future studies might benefit from measures of attendance, post-graduation college/military matriculation, and quarterly GPA's. Future research should be aimed at using the most temporal data paired with quarterly GPA to further explore this relationship.

Although future research could add additional and more clear insight on the relationship between first arrest and GPA over time, the relationship between first arrest and receiving a high school diploma is clear. This result can have implications for educators and practitioners who seek to understand the relationship of arrest on school outcomes.

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BIOGRAPHY

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