Abstract

Title: EXPLORING THE RELATIONSHP BETWEEN
                                EDUCATIONAL ATTAINMENT AND ARREST

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        The Forgotten Half are the segment of the population in the United States aged

16-24 who do not pursue postsecondary education. Several negative outcomes are

associated with this group, including an increased risk of criminal behavior. Most

research has focused on the relationship between dropping out and offending. However,

heterogeneity in educational attainment exists within this group, and it is not clear

whether this variation in amount of education is related to variation in offending rates.

Furthermore, while a strong correlation exists between the Forgotten Half and crime, the

mechanisms responsible for this relationship are less clear. Social control theory argues

that the stronger an individual's social bonds are, the fewer crimes he or she will commit.

Higher levels of educational attainment are expected to be inversely related with arrest

rates. Identity theory argues that the strength of one's identity, present and future, will affect his or her offending rates.

This dissertation uses the first 14 waves of the National Longitudinal Survey of Youth 1997 (NLSY97) to examine the relationship between educational attainment and arrest. Regressions were run to assess the effect of educational attainment on arrest for the Forgotten Half, as well as by gender and racial and ethnic group. Results from these zero-inflated negative binomial (ZINB) regressions confirm a relationship, with dropouts being arrested the most, high school graduates the least, and stopouts falling in the middle. Results for both childhood social control theory and identity theory models found that inclusion of concepts from these theories weakened the relationship between stopping out and arrest so much that the relationship became insignificant. Dropping out, on the other hand, was only slightly affected by the addition of these theoretical constructs. The relationship between dropping out and arrest was diminished more by the inclusion of theoretical variables measured during adulthood. The dissertation also considers the theoretical and policy implications of these findings.

EXPLORING THE RELATIONSHIP BETWEEN EDUCATIONAL ATTAINMENT
AND ARREST WITHIN THE FORGOTTEN HALF

by

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Table of Contents

List of Tables

List of Figures

Chapter 1 Introduction

In 2004, John Edwards spoke of this country not as unified and cohesive, but as a country of two Americas. One America consisted of people who live the American Dream, who are financially secure, and are 'set for life' ("Text: Sen. John Edwards Speech to DNC," 2004). The other America consisted of people who live paycheck to paycheck, who strive to make ends meet, and who have inadequate or no health care. The children of this struggling group can be considered the Forgotten Half, the half of the US population who are unlikely to pursue college in their adult lives (Grant, 1988a).

In 1988, the William T. Grant Foundation published a report about the Forgotten Half, which they defined as adults aged 16-24 who were not pursuing postsecondary education, and estimated at approximately 20 million persons (Grant, 1988a, 1988b). The Grant Foundation identified several negative outcomes associated with being part of this population, such as high unemployment rates and limited job prospects, declining real income and life factors for young families, and higher crime rates. Disadvantaged individuals from poor and minority backgrounds were also disproportionately represented in the Forgotten Half (Grant, 1988a, 1988b). Not surprisingly, being part of the Forgotten Half is also associated with an increase in a variety of problem behaviors including increased risks of substance abuse (Crum, Ensminger, Ro, & McCord, 1998; Townsend, Flisher, & King, 2007) as well as higher offending and incarceration rates (Harlow, 2003).

Three main levels of educational attainment exist within the Forgotten Half: dropouts, stopouts and high school graduates. High school graduates are individuals who

fulfill their school requirements and earn their high school diploma. Stopouts are those who have left school at some point, but return for either more coursework or to earn a credential such as a high school diploma or General Equivalency Diploma (GED). Dropouts obtain the lowest amount of education, as they leave school before graduating, never earning a credential. Previous research on the Forgotten Half and crime has typically focused on either just dropouts and their offending rates, or has compared offending outcomes for just two levels – high school graduates and dropouts (see (Sweeten, Bushway, & Paternoster, 2009). There have been studies that have compared multiple levels of educational attainment, but they have primarily focused on either substance abuse (Obot & Anthony, 1999) or on job and income outcomes (Cameron & Heckman, 1993; Murnane, Willett, & Boudett, 1995). Findings for these studies have not been consistent though. Some research has shown significant differences exist between the three educational attainment levels (Cameron & Heckman, 1993; Murnane et al., 1995), whereas other studies have found GED recipients and dropouts to be similar in terms of outcomes (Murnane, Willett, & Tyler, 1999; Obot & Anthony, 1999; Obot, Hubbard, & Anthony, 1999).

Scholars have generally relied on social control theory and identity theory to explain this relationship between educational attainment and offending in recent research. Social control theory argues that individuals would commit crime if it were not for the presence of social bonds. The stronger an individual's bonds to conventional social institutions like school, the less crime he or she is likely to commit (Hirschi, 1969; Reiss, 1951; Toby, 1957). Therefore, an individual who drops out of school should possess the weakest bonds and offend at the highest rates of the three educational attainment levels.

High school graduates, on the other hand, should offend the least, as their bonds to society would be the strongest. These bonds are not static in nature, however; social bonds can be strengthened later in life, such as through steady employment or marriage. An individual who was weakly bonded during adolescence but found steady employment as an adult would be less likely to offend because his or her bonds became stronger later in life.

The second theory, identity theory, argues that one's sense of identity is the strongest predictor of an individual's life outcomes and offending rates. One's school performance and actions like dropping out or graduating are reflections of one's identity, one's vision of his or her future self (Hoyle & Sherrill, 2006; Markus & Nurius, 1986). Therefore, identity theory would argue that an action like dropping out may not necessarily be related to higher crime rates. Individuals who have strong sense of self are more likely to act in ways that strengthen their future identity, and these actions should result in lower crime rates. An individual who drops out of school but sees him or herself as a worker, would likely strive to become gainfully employed and engage in behaviors and routines that would strengthen his or her worker identity. In contrast, individuals who have a weak sense of self, regardless of educational attainment level, will be much more likely to offend as they would be more likely to find themselves involved in unstructured environments, which are positively related with offending and delinquency rates (Osgood & Anderson, 2004).

Crime is disproportionately committed by those in the Forgotten Half. There is a strong correlation between low education rates and crime. Understanding this relationship could allow us to greatly lower crime rates. Studying this relationship is not straightforward, however. First, there has not been much research on the offending and educational attainment within the Forgotten Half. Offending research has focused primarily on dropouts, and research that has looked at multiple levels of educational attainment has focused on job and income outcomes.

Second, it is not clear whether there are offending differences between these three levels of educational attainment. Prior research on offending has combined stopouts with educational attainment levels like dropouts (see Sweeten et al., 2009). And research that has evaluated other outcomes for multiple educational attainment levels has been inconclusive. Sometimes stopouts appear no different than dropouts, while other times they are their own distinct category (Cameron & Heckman, 1993; Murnane et al., 1995).

Third, while a strong correlation exists between lower educational attainment levels and crime, the causal mechanisms are less clear. Higher offending rates may occur because lower education rates mean the individual has not learned skills that make prosocial opportunities more frequent. Or lower education rates may serve as a cue to employers and society that these individuals may engage in more antisocial behavior, and fewer legitimate opportunities are therefore provided for this individual. It is also not clear whether educational attainment levels are causally related to future offending rates at all. The relationship between these two factors could be spurious and there could be

4

some other factor that affects both offending and educational attainment rates that has not yet been considered.

The research on educational attainment and crime has both policy and theoretical implications. If educational attainment levels are inversely related to offending rates, then the more education an individual receives, the fewer crimes he or she is likely to commit. This position, argued by social control theory (Hirschi, 1969) would therefore recommend programs that encourage students to stay in school and earn the highest degree they can would be appropriate. However, if the relationship between educational attainment and offending is driven by other factors like identity salience, then it is important to determine the factors that are strongly related to offending and their relationship to educational attainment levels. Without an accurate understanding of the role educational attainment plays in predicting future arrest rates, time and money are devoted to potentially ineffective actions and programs.

THE CURRENT STUDY

This dissertation seeks to understand the role educational attainment has on criminal offending by looking at this relationship between arrest and three groups within the Forgotten Half: dropouts, stopouts and high school graduates. I will also explore the effect other variables like family background and school performance have on arrest to obtain a clearer picture of the relationship between educational attainment and arrest, using social control theory and identity theory to inform variable inclusion, hypotheses and model creation. Does the Forgotten Half have higher arrest rates because their lower educational attainment levels limit future opportunities? Or does it have poorer life

outcomes because other factors existed earlier in childhood that predicted both lower educational attainment levels and poorer life outcomes, such as weak bonds to parents or school?

The dataset I will be using is National Longitudinal Survey of Youth 1997 (NLSY97), a panel survey of 8,984 youths who were between ages 12-17 during the first wave of data collection. Respondents are interviewed every year; the first 14 waves of data will be used in this dissertation, to capture the timing of measures properly. Background and childhood variables will be measured during Waves 1-7. The educational attainment levels dropout, stopout and high school graduate are also recorded at Wave 8, and adult job and family variables will be measured during Waves 9 and 10. Finally, the offending outcome will be measured with information from Waves 11-14.

Chapter 2 Literature Review

INTRODUCTION

In 1988 the William T. Grant Foundation published a report on the Forgotten Half, identifying them as the approximately 20 million people aged 16-24 not pursuing postsecondary education (Grant, 1988a, 1988b). Being a part of the Forgotten Half is associated with a variety of negative outcomes related to the labor market such as higher unemployment rates, less stable employment, lower wages and lifetime earnings (Cataldi, Laird, Kewalramani, & Chapman, 2009; Freeman & Wise, 1982; Stoops, 2004; Swanson & Chaplin, 2003). Disadvantaged groups and racial/ethnic minorities are also disproportionately represented in the Forgotten Half (Cataldi et al., 2009; Chapman, Laird, & Kewalramani, 2010; Halperin, 1998; U.S. Department of Education, 2006). Inner-city graduation rates are estimated to be at least 15% lower than non-urban school districts (Swanson, 2004), and their dropout rates can be as low as 50% (Neild, Stoner-Eby, & Furstenburg, 2008). Finally, a direct relationship exists between being in the Forgotten Half and crime and delinquency. A large percentage of incarcerated individuals are part of the Forgotten Half (Cataldi et al., 2009; Chapman et al., 2010) and increased education has been found to be related to lower probability of incarceration (Lochner, 2004).

DIVERSITY WITHIN THE FORGOTTEN HALF

The Forgotten Half are defined as all individuals aged 16-24 who have not pursued or attended college. However, this definition includes several different types of

educational attainment, ranging from those who drop out of school and never return to those who graduate high school in less than four years. Furthermore, youth who drop out may permanently drop out, but they may also eventually return to school and receive a high school diploma, or they may earn a General Education Development (GED) certificate. High school dropouts are the group within the Forgotten Half who are arguably the worst off because they have the lowest educational attainment levels. While dropout rates have been decreasing overall since the 1970s, recent figures still indicate that a little over 3 million individuals aged 16-24, approximately 8.5% of the 16-24 population, are dropouts (Cataldi et al., 2009; Chapman et al., 2010). Recent annual dropout rates range from 340,000 to 390,000 individuals (Chapman et al., 2010; *College Enrollment and Work Activity of 2010 High School Graduates*, 2011).

High school completion rate figures indicate that approximately 85% of adults age 25 and older have earned at least a high school diploma or the equivalent (Crissey, 2009; Ryan & Siebens, 2012). Adults 65 and older have the lowest high school completion rate, while the high school completion rate for those aged 18-24 is 89% to 90% (Cataldi et al., 2009; Chapman et al., 2010). However, when high school completion rates are compared with the Average Freshman Graduation Rate (AFGR), the percentage of individuals who graduate with a high school diploma within four years, a sharp difference can be seen. In contrast to the high school completion rate, the AFGR is estimated to be between 66% and 75% (Barton, 2003; Cataldi et al., 2009; Chapman et al., 2010; Shore & Shore, 2009; Swanson & Chaplin, 2003). Studies have also found that AFGR rates are much lower in urban areas and large school districts, where rates are as low as 47% to 58% (Shore & Shore, 2009; Swanson, 2004, 2009; Swanson & Chaplin,

2003). The difference between the high school completion rate and the average freshman

graduation rate shows the variation that exists in achieving a high school education. The

GED certificate can help explain why there is a difference in these two rates, introducing

a third type of educational attainment available to the Forgotten Half.

The GED was developed in 1943 to help returning World War II veterans finish

their high school studies; by 1973, all 50 states offered the GED (*2010 GED Testing

Program Statistical Report*, 2011). The GED exam is comprised of five sections −

mathematics, reading, writing, science and social studies. Candidates must complete all

five sections and receive a minimum standard score in each section to be awarded the

GED credential. In 2010, approximately 740,000 individuals[1] took the GED exam and

475,000 successfully earned the credential (*2010 GED Testing Program Statistical

Report*, 2011). The majority of test takers (between 61-70%) are typically between 16-24

years old (*2010 GED Testing Program Statistical Report*, 2011; Snyder, de Brey, &

Dillow, 2016; Statistics, 2011). In the past decade, a little over half of all candidates have

been White, approximately 25% have been African American, and approximately 20%

have been Hispanic (*2010 GED Testing Program Statistical Report*, 2011). The highest

grade candidates had completed on average was the 10th grade, indicating the difference

in educational years the typical GED recipient has than high school graduates (*2010 GED

Testing Program Statistical Report*, 2011). Researchers estimate that anywhere from 5%

to 9% of dropouts have completed their high school education by passing the GED

(Chapman et al., 2010; Lerman, Riegg, & Aron, 2000). Encouragingly, research is

indicating that the GED completion percentage has been increasing, while dropout rates

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[1] All 50 US states, insular areas (i.e. American Samoa, Guam), inter-regional contracts (i.e. Bermuda, Federal Bureau of Prisons, Michigan Prisons). Does not include Canada (~14,000 candidates)

have been decreasing (Barton, 2003; Halperin, 1998; Lerman et al., 2000). Many states

have also been reporting increases in younger GED recipients[2], indicating the GED may

be starting to be considered an alternate form of secondary school educational attainment.

Recent trends also show that the proportion of graduates who received a high school

diploma has been decreasing, while the proportion of individuals receiving a GED has

been increasing (Lerman et al., 2000). From 1990 until 1997, the percentage of all 18-to-

24-year-olds with a high school diploma declined from 81% to 77%. However, the

percentage of individuals who earned a GED increased by 4%, from 5% to 9% (Lerman

et al., 2000). Of these three educational attainment levels in the Forgotten Half, the only

population increasing are GED recipients.

There is also variation in the educational attainment definitions used, which can

affect consistency among findings. Research factors such as choice of cohort, initial

membership and time for determining dropout status all affect the educational attainment

definitions (Rumberger, 1987). For instance, researchers have studied different age

ranges and different phases in individuals' lives when studying dropouts, such as ages 16

to 19 (Shore & Shore, 2009), 16 to 24 (*College Enrollment and Work Activity of 2010

High School Graduates*, 2011), and adults ages 25 and older (Crissey, 2009). Some

scholars have defined dropouts as students who have a prolonged absence from school

and did not complete their degree within a certain time period (see Kolstad & Kaufman,

1989), whereas others define dropouts as those who discontinue school for some time

period before receiving a high school diploma (Entwisle, Alexander, & Olson, 2005).

Still others consider dropouts to be individuals who fail to graduate with their class at the

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[2] Ages 16 and 17, comparing 1990 and 2000 rates (Barton 2005)

end of four school years (Swanson & Chaplin, 2003), or individuals not enrolled in high school, or individuals who are not a high school graduate (*KIDS COUNT Indicator Brief: Reducing The Number of Disconnected Youth*, 2005).

Similarly, definitions of high school completion rates also vary across studies. Some define high school completion as receiving a high school diploma or equivalency by age 24 (Cataldi et al., 2009), whereas other studies consider completion to be graduation within four academic years (Cataldi et al., 2009; Swanson & Chaplin, 2003). The Department of Education (2009) reported that in 2007, 89% of 18-24-year-olds had received either a high school diploma or equivalency credential such as the General Education Development (GED) certificate. However, when the AFGR was evaluated, only 73% of public school students who were 9th graders in 2005 graduated within four years (Cataldi et al., 2009). Similarly, graduation rates decreased from approximately 85% to approximately 65% when the requirement of receiving a diploma within four years is considered (Swanson & Chaplin, 2003).

Scholars have differed in the way they have categorized the GED when evaluating educational attainment levels. Inclusion of the GED also has also been treated differently by studies. GED recipients have been categorized as dropouts (Staff & Kreager, 2008; Sweeten, 2006), as high school credential recipients (Cataldi et al., 2009; *College Enrollment and Work Activity of 2010 High School Graduates*, 2011), or as their own separate educational attainment category (Murnane et al., 1995; Ou, 2008; Ryan & Siebens, 2012). The different ways GED recipients have been included in studies lead to inconsistent definitions and measures of educational attainment. Due to this variation, it

can be difficult to accurately determine the relationship between educational attainment and the life outcomes being evaluated.

OUTCOMES FOR THE FORGOTTEN HALF

While follow-up studies since the Grant Foundation's initial report in 1988 have found that the number of individuals in the Forgotten Half has declined from approximately one half to one third of the population, the outcomes for those who remain forgotten have worsened (Halperin, 1998). For example, several labor force outcomes are related to educational attainment. Individuals in the Forgotten Half are now more likely to be unemployed, and if employed, they earn less money than those 10 years ago. Unfavorable outcomes for young families such as teen motherhood, infant health risks, out-of-wedlock births and poverty, have all remained high (Halperin, 1998). Being in the Forgotten Half is also related to higher substance abuse rates (Townsend et al., 2007), including increased drinking levels (Crum et al., 1998), marijuana use (Kogan, Luo, Brody, & Murry, 2005), and injected drug use (Obot & Anthony, 1999; Obot et al., 1999).

Labor Force Outcomes and the Forgotten Half

Being in the Forgotten Half has been associated with less desirable labor outcomes, such as decreased employment and less stable employment (Freeman & Wise, 1982; Stoops, 2004; Swanson & Chaplin, 2003). Many employers have expressed a desire to hire individuals with college or necessary training experience for certain jobs, and do not believe that a high school diploma is an equivalent to having mastered those skills (Halperin, 1998; Rosenbaum & Binder, 1997). In addition, those in the Forgotten Half face geographic challenges; many live in central-city areas, but less than 10% of

12

jobs in these locations are available to non-college graduates (Holzer, 1996). Those in the Forgotten Half also experience more unemployment; rates are worst for high school dropouts, who are employed up to 70% less than high school graduates (Chapman et al., 2010; Freeman & Wise, 1982; Rooney et al., 2006; Sweeten et al., 2009; U.S. Department of Education, 2006).

In addition, work is more likely to be part-time, rather than full-time (Grant, 1988a, 1988b) and less stable (Freeman & Wise, 1982; Stoops, 2004; Swanson & Chaplin, 2003). Those in the Forgotten Half are more likely to be employed in service industries or retail trade, as they lack many skill requirements most employers are looking for (Holzer, 1996). Even when employed, those with lower levels of education receive lower wages, lower median salary and lower lifetime earnings (Belfield & Bailey, 2011; Cataldi et al., 2009; Crissey, 2009; Grant, 1988a; Shore & Shore, 2009). In 2007, the median income for bachelor's degree recipients was $47,000, but only $27,000 for high school graduates and $19,400 for non-high school graduates (Crissey, 2009). The Forgotten Half are estimated to be 42% of the adult population, but only generate 26% of the total income (Swanson, 2009).

When GED recipients are included in comparisons, the relationship between education attainment level and income becomes less clear. Some studies found the relationship between increased educational attainment and income to be positive when comparing high school dropouts to GED recipients (Murnane et al., 1995), GED recipients to high school diploma recipients (Cameron & Heckman, 1993; Murnane et al., 1999) and high school graduates to college graduates (Belfield & Bailey, 2011; Crissey, 2009). However, some researchers argue the increased income may be due to more

13

accumulated work experience and not more educational attainment (Murnane et al., 1999). Other scholars have found labor force outcomes for GED recipients and dropouts to be comparable, but different from high school graduates. And this difference in outcomes is argued to be due to the difference in number of years of schooling (Cameron & Heckman, 1993) or noncognitive skills (Heckman & Rubinstein, 2001). Others still have sought to investigate the relationship within GED recipients closer, finding that those who have very low academic skills benefit the most from receiving a GED credential (Tyler, 2003). In addition, age may play a factor, as employment and stable employment outcomes are not as affected for those who take the GED after age 17 (Heckman & Rubinstein, 2001).

Delinquency and the Forgotten Half

Decreased educational attainment is also associated with increases in crime and delinquency. Lower levels of education increase the probability of offending (Kogan et al., 2005; Lochner & Moretti, 2004), arrest (Grant, 1988a) and incarceration (Cataldi et al., 2009; Lochner & Moretti, 2004; Tyler & Lofstrom, 2009). While the causal order of the relationship has been debated, empirical studies consistently show a strong correlation between being in the Forgotten Half and higher offending rates. Dropping out of high school in particular is associated with an increase in offending. Earlier research has found that dropping out of school is positively associated with committing crime at later points in time (Thornberry, Moore, & Christenson, 1985). A more recent study found that receiving a diploma reduced the odds of both arrest and incarceration, and increased levels of education in general reduced incarceration odds for high school diploma recipients, GED recipients, and dropouts (Lochner & Moretti, 2004). Almost 90% of the

nation's state prison inmates are part of the Forgotten Half (Harlow, 2003). And empirical studies have shown that when inmates take education classes while incarcerated, their returns to school are higher and their re-arrest rates are lower (Blomberg, Bales, & Piquero, 2011; Tyler & Kling, 2006). Approximately 40% had obtained some high school education, but no credential. An additional 25% had received their high school diploma and an additional quarter had obtained a GED (Harlow, 2003).

However, the relationship between school attainment and crime is not uniform. Using the NLSY79, Jarjoura (1996) found that dropping out was related to an increase in violent crime, but only for youth not living in poverty. In addition, dropping out because the individual disliked school or for an unspecified reason was also related to future crime and delinquency (Jarjoura, 1993). Sweeten and colleagues, using the updated NLSY97 dataset, found that dropping out (for unclassifiable reasons and for economic reasons) was positively related to increased crime rates, but the effect decayed within a few years (Sweeten et al., 2009). They argued that those who left school early were at no greater risk of committing future delinquency because the individuals who were leaving school had already been committing crime (Sweeten, 2006; Sweeten et al., 2009). These findings highlight the heterogeneity that exists for dropouts; similar heterogeneity may exist for stopouts and high school graduates as well, but has not been examined yet.

Research on delinquency and being in the Forgotten Half thus far show a strong relationship between educational attainment and arrest. Evidence exists that dropping out is strongly tied with increased delinquency, arrest and incarceration rates. However, increasing educational attainment amounts have been shown to reduce future offending rates (see Lochner & Moretti, 2004; Tyler & Kling, 2006). Lower levels of education

15

increase the probability of offending, arrest and incarceration, and dropping out is associated with the highest rates of these behaviors. For this reason, I posit that dropping out will be associated with the highest arrest rates within the Forgotten Half. And because receiving a diploma is associated with lower arrest rates, I therefore hypothesize that high school graduates will have the lowest arrest rates. I also expect stopouts to be a distinct category, having arrest rates different from both dropouts and high school graduates.

> *H1: Dropouts will have the highest arrest rates, stopouts will have the second highest arrest rates, and high school graduates will have the lowest arrest rates.*

THEORETICAL EXPLANATIONS OF THE RELATIONSHIP BETWEEN THE FORGOTTEN HALF AND DELINQUENCY

There are several criminological theories that can explain the relationship between lower educational attainment and delinquency. Depending on the theory, one may hypothesize a positive, a negative or a spurious relationship. When considering a positive relationship (i.e., being in the Forgotten Half increases the risk of delinquency), scholars often invoke strain theory. From this theoretical perspective, youth who perform poorly in school experience strain due to status frustration. They engage in delinquency to cope with this strain. However, once they leave school, they no longer experience the levels of strain they did while in school, so delinquency rates would decrease. One of the most comprehensive early studies of educational attainment and delinquency was published in 1974 by Delbert Elliott and Harwin Voss. Their five-year panel study captured individual, home, school, and community-level factors related to students' school performance and engagement in delinquent acts. They collected data on approximately 1,300 students before the students entered 9th grade and conducted four follow-ups, one at

the end of each academic year. They found that delinquency rates for dropouts were higher and increased faster than for graduates throughout high school. Delinquency rates were highest just before leaving school, but then after the student dropped out, rates declined. Elliott and Voss also found that the school was the most important social context for youths, and found little evidence that dropping out was due to difficulties at home (Elliott & Voss, 1974). In the end, this was taken as support for many scholars that dropping out of school produced strain, which in turn increased offending rates.

However, as studies became more sophisticated by including factors such as age effects, selection effects, and longer follow-up periods (Sweeten et al., 2009; Thornberry et al., 1985), support for strain theory diminished. These more recent studies suggest that there may be selection effects at work, with certain factors explaining both educational attainment and offending. Because of such work, scholars have turned to two other theoretical frameworks to guide inquiries into educational attainment and delinquency: social control theory and identity theory.

Social Control Theory

Social control theory, in contrast to strain theory, argues that individuals are self-interested and hedonistic by nature and without the presence of social controls, individuals would commit crime (Hirschi, 1969; Reiss, 1951; Toby, 1957). Youth are socialized by parents and community, and through this process his or her bonds are strengthened. Age-graded informal social control theory extends social control theory by looking at crime over an individual's life span, evaluating offending through childhood, adolescence and adulthood (Laub & Sampson, 2003; Sampson & Laub, 1993). Education and school play a significant role during the adolescent phase of age-graded social

control theory through strengthening social bonds. Increased educational attainment and good school performance can have effects throughout adulthood by affecting job prospects and the likelihood of marrying a partner with similar strong social bonds. And while not specifically mentioned as an adult social bond, continuing education or returning to school could also be interpreted as a form of strengthened bonds.

From a social control perspective, youth who are committed to school and attached to school values and goals possess stronger conventional bonds than youths who are not, and are therefore more likely to perform better in school and commit fewer delinquent acts. Individuals who perform poorly or leave school, on the other hand, likely possess weak social bonds. The strength of the bonds is related to both educational achievement and delinquency levels, but in opposing directions. Therefore, an individual who dropped out of school would probably be even less bonded society and offend more than an individual who did not drop out of school. However, if these bonds strengthened later in life, such as through steady employment or marriage, offending rates would be expected to decrease.

Social control theory would argue that an individual with stronger social bonds to society should have lower offending rates than someone with weaker social bonds. During childhood, this bond would be to family and school, and during adulthood the bonds would be to employment and spouse. The greater the social control, the less likely it is that he or she will engage in delinquent behavior. Those variables that reflect strong bonds should be inversely related to the individual's offending rates. An individual with a parent who has strong social bonds is more likely to also have strong social bonds, resulting in higher educational attainment levels and lower offending rates. Dropping out

reflects the least amount of educational attainment and therefore the weakest social bond, so individuals who have dropped out most likely commit the highest amount of crime. In contrast, those who graduate high school have achieved the highest educational attainment level for those in the Forgotten Half and therefore should offend the least. Therefore, I expect that when social control constructs are added to the model, the effect of educational attainment on arrest will be lessened and social bonds should explain more of the variance in arrest than educational attainment level itself.

> *H2: Accounting for childhood social control variables will reduce the relationship between educational attainment and arrest.*

The third hypothesis pertains to the role social control variables play in the individual's adult life. Analogous to the expected effect it has on childhood arrest rates, I would expect once adult social control variables are added to the model, the relationship between educational attainment and arrest should be further weakened. The adult social control variables are also more likely to be strongly related to arrest rates since they are measured during Waves 9 and 10 and are therefore temporally closer to arrest frequency, measured from Waves 11-14. The hypothesis is as follows:

> *H3: Accounting for adult social control variables will further reduce the relationship between educational attainment and arrest.*

As in childhood, social bonds will continue to play an important role in predicting offending rates. An individual who is strongly bonded to society as a child will likely remain so during adulthood through such factors as high levels of attachment and stake in conformity (Hirschi, 1969; Toby, 1957). However, adulthood also presents an opportunity for bond strength to change (Sampson & Laub, 1993). A delinquent child

who did not perform well in school may get married or find stable employment, and these adult events would likely strengthen his or her social control levels.

Empirical support for social control theory is relatively strong. Several studies have found that a positive relationship between leaving school and subsequent offending exists. Thornberry and colleagues used the Philadelphia 1945 cohort study to compare crime rates for dropouts and graduates up to age 25 and found that youths who left school committed more crime than youths who did not for individuals up to the age of 25 (Thornberry et al., 1985). Using a sample of students from the southwestern US, Chavez, Swaim and colleagues compared both lifetime and recent drug use among dropouts and nondropouts. A control group was matched to dropouts for ethnicity, gender and school grade. They found that dropouts exhibited both higher lifetime rates of drug and alcohol use, and also perpetrated violence more when compared to controls (Chavez, Edwards, & Oetting, 1989). A later study which expanded on the student sample above found that dropouts had higher rates of both lifetime substance abuse and recent substance abuse after dropping out (Swaim, Beauvais, Chavez, & Oetting, 1997). Obot and colleagues studied a sample of Black adults over the age of 18 who had used cocaine, heroin or stimulants with a needle, and found that both high school dropouts and GED recipients were approximately two and a half times more likely than high school graduates to have injected drugs within the past three years (Obot & Anthony, 1999; Obot et al., 1999). Blomberg and colleagues' study showed evidence of the effect of strengthened social bonds on previously weak bonds had on offending rates. They studied 4,147 juvenile delinquents that had been released from Florida juvenile justice correctional institutions and found that those who had above average academic achievement while incarcerated

were significantly more likely to return to school after released. And in turn, those who returned and had average attendance rates in high school were less likely to be rearrested within the first year of release (Blomberg et al., 2011).

Research also supports social control theory's contention that weak social bonds, manifested through a poor home situation and a weak attachment to school, are also related to increased crime rates. Jarjoura (1993, 1996) found that many variables, such as prior offending and problem behaviors and demographic factors such as gender, age and race, were related to both delinquency and dropout. The relationship strength between delinquency and dropout was also affected by the reason the individual dropped out of school. Dropping out because the student disliked school, was receiving poor grades, or was expelled was significantly related to overall crime rates. Using the 1988 National Educational Longitudinal Study, Drapela measured the relationship between dropout and cigarette, alcohol and marijuana use, measuring both dropout at earlier ages ($8^{th} - 10^{th}$ grade) and later ages (11th and 12th grade). Including various controls like race, gender, problem behaviors, social control, strain and peer variables, she found that dropping out and substance use were not only weakly related, dropping out also had no significant effect on later drug use. Instead, factors like school discipline problems, disruptive home environment, running away from home and drug use prior to dropping out were much more strongly related to substance abuse (Drapela, 2004, 2006). Bryan and colleagues studied the effects of school bonding on academic achievement, while controlling for intervening variables such as prior academic achievement and school-related delinquency. Their study revealed that both prior academic achievement and school-

related delinquency levels were related to current academic achievement levels (Bryan et al., 2012).

The adult social bonds most researched have been marriage and steady employment. Marriage has consistently been found to be negatively related to crime rates (Laub, Nagin, & Sampson, 1998; Sampson, Laub, & Wimer, 2006). Laub and colleagues found that not only was marriage associated with reduced offending rates, but the relationship was even stronger for those who married earlier (Laub et al., 1998). Horney and colleagues also found evidence of a relationship between crime and marriage (Horney, Osgood, & Marshall, 1995). Using Hierarchical Linear Modeling, they found that men were less likely to offend when they were living with their wife, regardless of individual criminal propensity level. Warr also found that marriage was related to desistance, but the cause was attributed to a change in socialization routines. That is, when individuals got married, their social networks changed. They were more focused around their spouse and less around their former friends, which seemed to reduce opportunities and motivation to offend (Warr, 1998). In 2006, Sampson and colleagues took an approach using propensity score analysis to compare offending rates of married men with comparable unmarried men in their dataset. They found that being married was associated with a 36% reduction in offending for men aged 17-32 (Sampson et al., 2006).

Studies also show evidence of a negative relationship between steady employment and offending. Using the Glueck data, Sampson and Laub have found steady work to be been inversely related to offending rates (Sampson & Laub, 1993), and Hagan and McCarthy found a similar relationship (Hagan & McCarthy, 1997). Studying homeless youths in two Canadian cities, they found that steady employment helped decrease crime

rates by exposing homeless youth to individuals who also worked, which helped "extract them from the stigma and criminality of street culture" (Hagan & McCarthy, 2005). They also found that criminal activity was related to sporadic employment – increased exposure to crime led to increased socializing with delinquent peers and less stable employment (Hagan & McCarthy, 1997, 2005). Uggen also found work to be a turning point away from crime. In addition, he found an age effect existed – employment had a stronger effect on offending for those aged 27 and older (Uggen, 2000). A study of 274 males incarcerated in juvenile institutions studied the effects of employment on subsequent offending, and used group-based trajectory analysis to determine whether employment differentially affected different individuals with different offending rates. They found that overall, being employed for a year was associated with a 65% reduction in conviction rates compared with being unemployed for the same amount of time (Van Der Geest, Bijleveld, & Blokland, 2011). Regular employment was most strongly related to desistance for the high-frequency desister group, but for high-frequency chronic offenders, temporary employment was sufficient to reduce offending rates (Van Der Geest et al., 2011).

Identity Theory

Identity theory, as the name implies, argues that one's perception of self and sense of identity is an important factor, influencing how one sees oneself, interprets past events that shaped one's identity, and the different possible selves one may become. An individual's identity is considered his or her sense of self, and his or her actions are considered expressions of one's identity. One's identity is not unidimensional, however. An individual can consider him or herself to have several identities or roles in life, such

as a student, a friend, a son, or a boyfriend. The stronger the identity salience[3], the more

commitment to that identity is displayed, and the stronger the ties are to one's identity

(Stryker & Burke, 2000). Multiple identities may exist at one point in time within an

individual, but also in different points in time. The present-oriented identity can be

regarded as an individual's 'working self' and the future-oriented identities are

considered his possible selves (Hoyle & Sherrill, 2006; Markus & Nurius, 1986). The

working self is present-oriented, it is influenced by both past experiences as well as

aspirations of who he would like to be, or the possible self. The possible self is a person

an individual would either desire to be, or a self that he fears being (his 'feared self')

(Hoyle & Sherrill, 2006; Markus & Nurius, 1986). Because of their nature, possible

selves have not been fully realized, and are therefore more changeable and less

constrained by reality. So when an individual behaves in a certain manner, identity theory

posits that he or she behaves in a way that is committed to present and future identities

(Burke & Reitzes, 1991). Actions and behaviors may change over time due to new

experiences, constraints or goals, and one's identity is reflected upon and adjusted

accordingly. Identity can be affected by social interactions and the symbolic meaning of

these actions and roles as they affect one's definition of his or her self.

Identity theory would therefore posit that one's school performance and actions

like dropping out or graduating are reflections of an individual's identity. An individual

may drop out because his or her working self and possible selves are not strongly tied to

school; stronger roles such as being a parent or a career person may be more important.

Similarly, the type of school program he or she is enrolled in, amount of time spent in

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[3] Identity salience is defined as "the probability that an identity will be invoked across a variety of
situations, or alternatively across persons in a given situation" (Stryker and Burke 2000: 286)

school versus other activities can also be indicators of identity, where he or she likes to spend his or her time, and who he or she sees him or herself becoming. If an individual has a focused sense of identity such as career person or parent, even if it is not as a student, delinquency rates are likely to be low because his or her focus, time, peers and routines are situated around this identity. On the other hand, if his sense of identity is not clear and he performs poorly in school, his time and attention may be focused elsewhere, and less structured because neither school nor alternative endeavors such as work will be focusing his attention, and empirical research has found less structured environments to be positively correlated with delinquency rates (Osgood & Anderson, 2004). Therefore, if an individual has a strong sense of identity and future self, even if it is not strongly tied to education, then dropping out or leaving school leaves him or her freer to engage in the aspects of his life he or she does identify with, and criminal activity levels should lessen or remain low. Individuals who drop out but worked during the school year, for example, may engage in less criminal activity because leaving school allows them to engage in their identity as a worker more. If on the other hand, he or she does not have a strong sense of identity, then he or she will likely spend more of the emerging adulthood years figuring out his or her identity, and crime and substance abuse rates will remain high until a clearer future self and identity is determined.

A concept closely related to identity theory is emerging adulthood. Emerging adulthood, a distinct period from ages 18-25, is the time where identity exploration and evolution is likely to occur. An individual's identity is shaped by exploring life directions in a variety of dimensions (Arnett, 2000). It is neither adolescence, nor young adulthood, but its own distinct period in one's life. During emerging adulthood, an individual tends

to experience changes in demographics, subjective perceptions and identity exploration (Arnett, 2000). The ideas in emerging adulthood and identity theory are clearly linked in that this period is an important time that an individual's identity is shaped, refined or possibly redefined from what it was during childhood and adolescence. Changes in school, work and romantic relationships all occur during this time. These changes in demographics, self-perception and identity exploration can alter an individual's perception of him or herself. They can also make his or her routines less structured and less likely to be monitored by parents, spouses or children. In addition, jobs are more likely to be transitory or part-time in nature. This uncertainty and exploration could cause turmoil and increased risky behavior, specifically in the form of sensation seeking and trying new experiences (Arnett, 1994), which peaks during emerging adulthood. Arnett found that risky behavior such as unprotected sex, binge drinking, substance use, risky driving behaviors all peak during emerging adulthood, not adolescence (Arnett, 2000). Emerging adulthood would postulate that an individual in this phase, because he is still exploring and solidifying his identity and has fewer structural constraints, would engage in more crime than as an adult. However, once more constrained or once the individual's identity is clearer, crime and delinquency rates should decrease.

Initially, criminology incorporated identity theory as a way to explain desistance, positing that a change in identity is a necessary ingredient in desisting from crime (Giordano, Cernkovich, & Rudolph, 2002; Giordano, Schroeder, & Cernkovich, 2007; Maruna, 2001; Paternoster & Bushway, 2009). However, in the past few years, identity theories have also been applied to explore other aspects of crime, such as the relationship

26

between adolescent employment and crime and the relationship between educational attainment and crime.

One of the first studies to use identity theory as an explanation for desistance was Shadd Maruna's research that compared ex-offenders' narratives with active offenders. For Maruna, an individual's redemption script is an important part of the desistance process, where an individual identifies a 'real me' that existed at a time when he or she did not engage in crime (Maruna, 2001). Giordano and colleagues (2002) believe that a cognitive transformation, which can vary in degree, is a key construct that leads to desistance. Paternoster and Bushway (2009) also see a change in identity as a necessary ingredient in desistance. For them, the identity that spurs change is the feared possible self that a criminal sees as a realistic future for him or herself if current criminal activity continues. While these three perspectives differ in terms of the importance of cognitive transformation and identity change that must happen, or whether identity is based on one self or a patchwork of several selves, they are able to show that identity plays a crucial part in criminal behavior (Giordano et al., 2002; Maruna, 2001).

Identity theory would argue that it is an individual's sense of identity, not educational attainment level, which is the stronger predictor of arrest. An individual less sure about his or her future identity is more likely to commit higher rates of crime. An individual who has a strong sense of self, on the other hand, should commit low rates of crime because his or her focus, peers and routines are situated around this identity. The identity can be related to being a good student and doing well in school, but it can also be related to other outcomes like being a good worker or parent. Like the first social control theory hypothesis, the first hypothesis involving identity theory is:

27

H4: Accounting for an individual's sense of identity in childhood will weaken the relationship between educational attainment and arrest.

There are several variables that will be used to measure having a strong sense of identity. First, being in a high school program like college preparatory, earning good grades in school and earning a high school diploma are indicative of an individual who has a strong conventional sense of identity, who sees him or herself as a good student and achiever. There are similar indicators of an individual who sees himself as a worker, such as being in a vocational or co-vocational program in high school. Unlike social control theory, identity theory would not necessarily predict an ascending relationship between educational attainment level and arrest, because one's sense of identity is not necessarily tied to higher levels of educational attainment, though. If an individual drops out of school because he or she identifies with being a good worker or parental figure, then even though educational attainment levels are lower, sense of self is high and arrest rates will be lower.

On the other hand, if an individual has a weaker sense of self, arrest rates are likely to be higher because his or her attention is not focused on constructive, prosocial endeavors such as education or work, and his routines will be less structured, providing more opportunities to offend. Certain school programs (e.g. other school program) and reason the individual left school are two variables that can lend insight into this identity salience. Leaving for logistical reasons can be an indicator of a frailer sense of self, so once the individual has left school, meandering and offending is more likely than for someone who has a stronger sense of purpose and more structured routines.

The fifth and final hypothesis is that adult events such as marriage or steady employment can provide opportunities to give the individual a clearer sense of identity.

As Arnett argues, emerging adulthood is a period in early adulthood where changes in demographics, relationships and identity frequently occur (Arnett, 2000). However, as an individual's life stabilizes and his or her future becomes clearer, his or her identity becomes stronger. And events such as getting married, embarking on a career or buying a house can provide that sense of identity, that of a worker, of a partner or parent. And this clearer vision of self, likely stronger than during adolescence, should in turn reduce subsequent arrest rates.

> *H5: Accounting for adult identity variables will reduce the relationship between educational attainment and arrest.[4]*

Only a few studies have incorporated identity theory constructs when studying the relationship between educational attainment and delinquency. Building on the work of Jarjoura (1993, 1996), Sweeten and colleagues (2009) used the first six waves of the NLSY97 to explore the relationship between delinquency and dropout. They investigated whether the reason an individual dropped out had effect on subsequent delinquency. While most some reasons such as dropping out for personal reasons were not supported, there was some evidence that dropping out for economic reasons had a negative relationship with subsequent delinquency (Sweeten et al., 2009). Sweeten and colleagues followed up their 2009 research with a study that investigated the way identity was related to employment during adolescence, educational attainment and problem behaviors. They found that the effect of work differed by one's identity, by dimensions of

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[4] It should be noted that Hypothesis 3 and Hypothesis 5 will be tested with the same measures (i.e., , the adult variables used to test social control theory and identity theory are the same). Importantly, however, the models are slightly different due to the childhood variables included in the models. That is, Hypothesis 3 incorporates childhood social control theory variables and Hypothesis 5 incorporates childhood identity theory variables.

one's possible self. Neither low nor high intensity work significantly affected a student's GPA on its own, but it was significantly related depending on an individual's college expectations. Low and high intensity work affected students differently depending on the individual's college expectations, but not present identity as a good student (Sweeten, Paternoster, & Bushway).

Research on individuals during the period of emerging adulthood show evidence that individuals 18-25 engage in delinquency and risky behaviors, but the focus has been on the Unforgotten Half. Jennings and colleagues (2011) analyzed data from 1,920 college arrestees from 2003-2007. They found that male and violent offenders significantly were more likely to demonstrate offending continuity. In addition, this pattern of offending continuity was also related to an increased likelihood of dropping out of college, thus showing the link between increased offending and poorer educational attainment to exist for the Forgotten Half as well as the Unforgotten Half. Thompson (2007) also found that a relationship between alcohol-related arrests and school retention existed; multiple arrests increased the odds of school attrition by approximately 30% (Thompson, 2007). Ford and Schroeder (2010) investigated offending in a college population as well and found evidence of a protective effect of higher education. In addition, this protective effect was stronger for individuals who had engaged in more delinquency during adolescence (Ford & Schroeder, 2010); marriage and stable employment, however, did not seem to have a similar protective effect. Ford and Schroeder therefore argued that higher education could be an important life event that could serve as a positive life change for juvenile offenders. Consistent with the emerging

adulthood perspective, higher education could be interpreted as a form of identity

exploration that has yielded positive results.

GENDER AND RACIAL/ETHNIC DIFFERENCES IN ARREST

Literature clearly highlights both gender and racial/ethnic differences regarding

educational attainment and offending. A greater percentage of men drop out of high

school and a smaller percentage men earn high school diplomas than females (Cataldi et

al., 2009; Swanson, 2004). Men also offend at higher rates than females (Moffitt, 2001;

Mosher, Miethe, & Phillips, 2002) even when those who completed the same educational

attainment level are compared (Hirschfield, 2009). Racial and ethnic minorities have

higher offending rates and lower educational attainment levels when compared to Whites

(Stearns & Glennie, 2006; Tyler & Lofstrom, 2009). High school completion rates for

minorities are much lower than for Whites (Cataldi et al., 2009; Crissey, 2009; Freeman

& Holzer, 1986; Kelly, 2000; Lee, 2002), with Hispanics' graduation rates even lower

than Blacks' graduation rates (Kolstad & Kaufman, 1989; Lerman et al., 2000). In

addition, greater proportions of Blacks and Hispanics are likely to take the GED (*2010

GED Testing Program Statistical Report*, 2011)[5] and drop out (Chapman et al., 2010),

and these rates have remained higher for minorities over the past 40 years (Lee, 2002).

Because of such differences in offending and educational attainment outcome, the

analysis will investigate whether there are gender and racial/ethnic differences in the

models testing the aforementioned hypotheses.

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[5] Hispanics comprised anywhere from 18.2% to 22.7% of GED candidates from 2003-2010. Blacks comprised anywhere from 20.6% to 25.4% of GED candidates from 2003-2010 (American Council on Education 2011)

31

Pursuing these additional analyses is arguably consistent with the primary theme of this dissertation. The literature review argues that an aggregate focus on the 'Forgotten Half' could mask important variation within that category. Likewise, it may be that failing to distinguish between males and females, and White and minority subjects, may obscure meaningful differences.

SUMMARY

Overall, the empirical literature indicates that those with lower educational attainment are different than those with higher educational attainment in several ways – their family and background factors are poorer, school performance is worse, and delinquency rates are higher. A limitation of the empirical research thus far, however, is that not much research has been conducted on the relationship between the different levels of educational attainment and crime within the Forgotten Half. While the indicators above are a helpful starting point, most of the previous literature focuses on the relationship between dropping out and crime. This is limiting for three main reasons.

First, many negative outcomes are associated with the entire Forgotten Half, not just dropouts. While the effects are most likely worse for those who drop out, negative outcomes of lower educational attainment have been argued to exist for all in the Forgotten Half (Grant, 1988a; Rumberger, 1987; Swanson & Chaplin, 2003). However, as previous research is showing, there is heterogeneity within the Forgotten Half; heterogeneity exists within educational attainment, offending, and other life outcome levels such as job and income. It is therefore a worthwhile pursuit to determine whether life and criminal outcomes are bad for everyone in the Forgotten Half, or if the

relationship varies. If variability exists, does it differ by level of educational attainment received or a different factor? This question will be explored in Hypothesis 1.

Second, the literature on dropout has included a variety of definitions so the relationship between dropping out and crime is not clear. Definitions of dropouts and high school graduates have varied, as well as categorizations of GED recipients. This has made it less clear whether different offending patterns exist for distinct educational attainment groups such as dropout, stopout and high school graduate, whether some levels should be combined, or whether the Forgotten Half as whole should just be the group to be examined.

Studying the relationship between crime and the Forgotten Half will add to and enrich the existing literature on educational attainment and crime in several ways. First, it will include an additional level of educational attainment in the analysis, treating stopouts as their own unique group of individuals. By studying several educational attainment levels as well as variety of reasons for varying educational attainment levels, this research will help present a clearer picture of the relationship between educational attainment and crime for those in the Forgotten Half. Second, it will examine heterogeneity within the Forgotten Half from a demographic perspective, as there are patterns related to both offending and educational attainment levels.

Chapter 3 Data and Methods

The data used for this study are from the National Longitudinal Survey of Youth 1997 (NLSY97), sponsored by the Bureau of Labor Statistics of the U.S. Department of Labor. The NLSY97 is a nationally representative sample comprised of respondents who are born between 1980-1984 at the first interview; a total of 8,984 respondents ages 12-18 are surveyed in Round One. It is comprised of two subsamples: an initial sample of 6,748 respondents, and a supplemental sample where Hispanic or Latino and Black respondents are oversampled, comprising 2,236 respondents. Respondents are surveyed on an annual basis. The NLSY97 gathers information on eight major topic areas: (1) employment and unemployment, (2) schooling and education, (3) job training, (4) income, assets and social welfare program participation, (5) family background, (6) marital status and family, (7) health, and (8) antisocial and problem behaviors, which includes criminal justice system interventions like arrest and whether an individual was incarcerated for a given offense (Michael & Pergamit, 2001).

Sample Selection

The original sample size in 1997 was 8,984 individuals. The sample for this dissertation was reduced to include only the Forgotten Half, thus making the total number of individuals in the dataset to 3,217. This was determined by identifying all individuals who had not pursued any postsecondary education by the age of 25. The Forgotten Half in this dataset represents approximately 31% of the original sample, which is consistent with more recent studies' estimates of the size of the Forgotten Half (Halperin, 1998).

When comparing those in the Forgotten Half with those who are not, there are both demographic and offending differences. Table 3.1 shows the demographic differences for the Forgotten Half and the Unforgotten Half by gender, and Table 3.2 shows the differences by racial or ethnic group. From Table 3.1, we can see that males represent a larger portion of the Forgotten Half, compared with their representation in the Unforgotten Half (58% versus 47% respectively).

Table 3.1 Descriptive Comparison Between Forgotten Half and Unforgotten Half by Gender

	Forgotten Half		Unforgotten Half	
	N	% of FH	N	% of UH
Male	1,863	57.9%	2,702	47.4%
Female	1,355	42.1%	2,997	52.6%
Total	3,218	100%	5,699	100%

Table 3.2 shows us that Blacks and Hispanics comprise greater percentages of the Forgotten Half, compared with their representation in the Unforgotten Half. Blacks represent 32% of the Forgotten Half, but only 23% of the Unforgotten Half. A greater percentage of Hispanics are also in the Forgotten Half, when compared with the Unforgotten Half (25% versus 19%). The reverse is true for Whites; a greater percentage of Whites are in the Unforgotten Half than the Forgotten Half. Finally, there is a difference in the arrest frequency between these two groups.

Table 3.2 Descriptive Comparison Between the Forgotten Half and Unforgotten Half by Racial or Ethnic Group

	Forgotten Half		Unforgotten Half	
	N	% of FH	N	% of UH
Black	1,025	31.9%	1,295	22.7%
Hispanic	811	25.2%	1,077	18.9%
White	1,314	40.8%	3,060	53.7%
Other Race	68	2.1%	267	4.7%
Total	3,218	100%	5,699	100%

In addition to demographic differences between the Forgotten Half and Unforgotten Half, there are also differences in arrest rates during Waves 11-14. Arrest frequencies were calculated for each racial and ethnic group. Table 3.3 shows the difference in arrest frequency for Forgotten Half and Unforgotten Half. The average arrest frequency for the Forgotten Half is 0.364, whereas for the Unforgotten Half, it is only 0.115. Finally, independent t-tests were performed, comparing the arrest rates of groups in the Forgotten Half with groups not in the Forgotten Half. Given the means and standard deviations of the arrest frequency variables, unequal variance was assumed. All t-tests found significant differences in frequency of arrest for between the Forgotten Half and the Unforgotten Half. Differences were significant for each gender and racial/ethnic group as well as when the Forgotten Half were compared with the Unforgotten Half.

Table 3.3 Arrest Frequency for Forgotten Half and Unforgotten Half, by Demographic Group

	Forgotten Half		Unforgotten Half	
	Mean	Standard Deviation	Mean	Standard Deviation
Male	0.492	1.416	0.173	0.750
Female	0.189	0.712	0.065	0.406
Black	0.399	1.210	0.176	0.731
Hispanic	0.376	1.320	0.103	0.480
White	0.322	1.049	0.094	0.575
Other Race	0.500	1.377	0.082	0.349
All	0.364	1.181	0.115	0.593

Dependent Variable

The dependent variable for this study is the cumulative frequency of arrest from

Waves 11-14. It is a sum of all self-reported arrests during these four waves. A total of

545 individuals have been arrested at least once during this timeframe. Table 3.4 shows a

breakdown of cumulative frequency of arrest as of Wave 14.

Table 3.4 Breakdown of Cumulative Frequency of Arrests During Waves 11-14

Number of Arrests	Number of Observations
0	2,644
1-5	514
6-10	23
11-15	6
16 or more arrests	2

Independent Variables

The NLSY97 dataset contains a rich measure of variables. This section has been

broken down into the following subcategories: educational attainment variables,

childhood variables and then adulthood variables.

Educational Attainment

The primary variable of interest will be educational attainment. This dissertation

disaggregates educational attainment into three levels. These three levels, in increasing

order, are: (1) dropouts, (2) stopouts and (3) high school graduates. First are dropouts,

comprised of individuals who dropped out of school and did not return. The second

category are stopouts, individuals who dropped out but did return to school or education

in some fashion. Stopouts may have dropped out again, earned a GED credential, or

earned a high school diploma. The third category of educational attainment is high school

graduates, students who never dropped out of high school and earned their high school diploma by Wave 8. For this study, *Dropout* and *Stopout* are as the independent variables and *HS Graduate* is the reference category.

During each wave, individuals are asked their educational enrollment status. Enrollment status measured whether the individual was enrolled, as well as the highest credential earned (if the individual was not enrolled). Dropouts are considered individuals who left and never returned to school; their enrollment status therefore changed from being enrolled to not being enrolled and no credential had been earned. Stopouts, on the other hand, left school but either returned to school or received their GED. An individual is categorized as a *Stopout* if his or her enrollment status changed from being enrolled, changed to not enrolled without a high school credential, and then changed again to either being enrolled or earned a high school credential. The third educational attainment category, *High School Graduates*, are individuals who never left school and earned their high school diploma. Individuals are coded as high school graduates if their enrollment status changed from being enrolled to earning a high school diploma, with no other status changes occurring between those two status changes. Educational attainment variables are measured at Wave 8, when the average age of respondents is 22 and the age range is from 20-25.[6] Table 3.5 provides the educational attainment definitions used in this dissertation.

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[6] This study excluded individuals who were aged 19 or younger at Wave 8 (a loss of 24 people) because these people are within the legal enrollment age for high school and therefore may not have had the opportunity to complete high school. Moreover, they may not fall into any of these categories if they have been consistently enrolled but have not yet graduated.

Table 3.5 Educational Attainment Definitions

Educational Attainment Level	Nominal Definition	Operational Definition
Dropout	Individual who drops out of school and never returns.	Individual's enrollment status changed from "enrolled in grades 1-12, not a high school graduate" to "not enrolled, no high school degree, no GED" (status code changed from 8 to 1) sometime during Waves 1-8
Stopout	Individual who drops out of school but later returns. He or she may earn a GED or high school diploma or drop out again	Individual's enrollment status changed from "enrolled in grades 1-12, not a high school graduate" to "not enrolled, no high school degree" and changed again to either "enrolled in grades 1-12, not a high school graduate," "not enrolled, GED," or "not enrolled, high school degree" (status code changed from 8 to 1 to either 8, 2 or 3) sometime during Waves 1-8.
HS Graduate	Individual who never drops out and earns his or her high school diploma	Individual's enrollment status changed from "enrolled in grades 1-12, not a high school graduate" to "not enrolled, high school degree" and the status "not enrolled, no HS degree, no GED" never occurred (status code changed from 8 to 3 and 1 never occurred) sometime during waves 1-8

Childhood Social Control Variables

Social control theory emphasizes the importance of both family process and family structural variables (Hirschi, 1969; Sampson & Laub, 1993). There are several variables recorded from the NLSY97, all of which were collected during Wave 1 unless otherwise noted. Some variables are measured in scales, though, and some measured in binary, which may limit the ability to compare them.

Two family structural variables were used for this dissertation. *Lives with Both Biological Parents* is a binary variable that captures who the individual lives with. Parents strengthen an individual's social bonds by promoting attachment (Hirschi, 1969) and increasing the amount of indirect social control (Nye, 1958). Sampson and Laub (1993) also argue that structural background factors like family disruption can affect bonds to school and family. An individual living with two biological parents, versus one

biological parent or foster parents, is less likely to experience family disruption and have

more opportunities to have social bonds strengthened because of the increased

monitoring and attachment opportunities that can be provided from a more stable

parenting presence. If the value is zero, that means the respondent lives with one

biological parent and a stepparent, his biological mother only, another family member, or

another housing arrangement. The second social structural variable is *Mother's*

Education Level, measured from grade one through eight years of college or more. A

mother with higher levels of education would likely be able to provide for her children

better, as education and socioeconomic status are highly correlated (Dubow, Boxer, &

Huesmann, 2009). She would also be more likely to raise her child(ren) in a manner that

would foster stronger bonds in them, thus resulting in higher educational attainment

levels and lower arrest rates (Davis-Kean, 2005; Jenkins, 1995).

Empirical research has shown that school performance variables have been

strongly related to both delinquency rates and lower levels of educational attainment

(Alexander, Entwisle, & Horsey, 1997; Battin-Pearson et al., 2000; Lochner & Moretti,

2004; Townsend et al., 2007). Individuals who perform poorly in school have been found

to engage in higher rates of delinquency (Drapela, 2004; Elliott & Voss, 1974). Social

control theory also argues that stronger bonds to school through attachment, commitment,

involvement and beliefs is also negatively related to a student's delinquency levels

(Hirschi, 1969). *HS Grades* represent the grades the respondent received while in high

school; the highest grades of the years sampled was chosen. Values ranged from one to

eight, where one equals mostly below D's and eight equals mostly A's. School

commitment variables have been shown to be related to education, and social control

theory has argued that bonds such as attachment and commitment to school are negatively related to delinquency (Hirschi, 1969). The individual's positive perception of school. *Positive School Attitude* is a variable comprised of seven responses related to an individual's perception of school, such as thinking the teachers are interested in students and students are graded fairly. Scores range from zero to seven, where higher scores represent a more positive perception of school, and arguably a stronger bond to school through attachment and beliefs. Finally, *Number of Days Absent* measures the number of days an individual was absent from school. More number of days absent implies lower involvement and commitment to school, and therefore lower educational attainment levels and higher offending rates (Hirschi, 1969).

The final childhood social control theory variable comes from age-graded informal social control theory. Numerous studies have found a relationship between difficult temperament and offending (Moffitt, 2001; Thornberry & Krohn, 2011) and age-graded informal social control theory hypothesized that in addition to structural background factors, individual difference constructs could affect the strength of an individual's social bonds. Factors such as a difficult temperament or early conduct disorder could weaken school attachment and parental bonds, which would in turn increase delinquency rates (Sampson & Laub, 1993). A proxy for these individual differences in the NLSY97 is the individual's *Mental Health Index*. Scores were calculated for all individuals during Wave 4 and ranged from five to 20, where lower scores indicate the youth had more emotional problems.

Childhood Identity Theory Variables

The NLSY97 also contains variables relevant to identity theory. Identity theory would argue that educational attainment and performance are reflections of one's identity, and the relationship with delinquency would vary according to whether one's actions are in congruence with his identity and future self's expectations (Hoyle & Sherrill, 2006; Markus & Nurius, 1986; Stryker & Burke, 2000). School program variables would be helpful measures of such expectations because the type of school program may be an indicator of possible type of self the individual envisions. Five different types of mutually exclusive school programs exist: *College Prep, Vocational* (vocational technical program), *Covocational* (academic and vocational combined program)*, General School Program,* and *Other School Program.* If, for example, an individual's identity is closely tied with being a worker and he sees himself pursuing a career, then being in a *Vocational* program could be an indicator of how he sees his future self. All five school programs are measured as dummy variables, where one indicates he or she participated in that program and zero indicates he or she did not. The *General School Program* is the reference category for these five school programs.

A final childhood identity theory measure is related to work the individual engaged in as an adolescent. Some research finds working while in school to be detrimental to school performance and positively related to offending (Staff & Uggen, 2003; Wright & Cullen, 2000; Wright, Cullen, & Williams, 1997). However, more recent research finds the relationship not to be harmful (Apel, Bushway, Paternoster, Brame, & Sweeten, 2008; Paternoster, Bushway, Brame, & Apel, 2003), but instead depends on other factors such as type of work the whether the work is formal or informal (Apel,

Paternoster, Bushway, & Brame, 2006), or the individual's offending patterns prior to

working (Apel et al., 2007). Sweeten and colleagues' 2009 study found that individuals

who had stronger worker identities tended to offend less, even if they had dropped out of

school (Sweeten et al., 2009). This dissertation contains a measure of an individual's

adolescent work levels that are assumed to indicate whether a worker identity may be

present. An individual who worked a lot during the school year may be doing so because

work, not school, is of more interest. *Worked Intensely* is a binary variable that measures

whether the individual worked 20 hours or more a week during the school year in at least

one year during Waves 1-7.

Social Control and Identity Variables in Adulthood

Steady employment is specifically mentioned by age-graded informal social

control theory as an important adult social bond (Sampson & Laub, 1993). Empirical

research has shown that an inverse relationship exists between employment and crime

and it also exists for dropping out for employment identity reasons and crime (see

(Uggen, 2000). Identity theory also believes steady employment to be important if it is

consistent with a worker identity (Sweeten et al., 2009; Sweeten et al.). Several job and

income variables were recorded during Waves 9 and 10. *Works Full-time* was measured

as a one if the individual worked full-time in either Wave 9 or 10. *Unskilled Profession*

was coded as a one if the individual worked in an unskilled profession, and a zero if the

individual worked in a skilled profession.

Age-graded informal social control theory also explicitly notes the importance of

marriage in terms of its relationship to crime (Sampson & Laub, 1993), but several other

theories also note that it may be correlated with crime. If being married was congruous

with one's identity, identity theorists would also argue that being married should reduce crime rates (Hoyle & Sherrill, 2006; Markus & Nurius, 1986; Stryker & Burke, 2000). However, if the marriage produced was not of importance to one's identity, then it would have no effect or possibly even a positive effect on offending rates. This dissertation captures two variables related to marriage and children. *Married* is a binary variable where one means the individual was married in Wave 9 or 10, or both. *Number of Children* records the maximum number of the respondent's biological children that are living in his or her household during Waves 9 and 10.

Control Variables

Several variables known to be strongly correlated with offending rates will also be included for analysis. *Gender*, a strong correlate of criminal activity, is coded as a binary variable where one means the respondent is a male and zero means the respondent is a female. The individual's race or ethnicity is divided into four dummy variables: *White, Black,* and *Hispanic*, where *Other Race* is the reference category. The respondent's *Age* during Wave 11 is also captured.

Variables that measure offending and delinquent behavior while in school were also coded; all were collected during Wave 1. One of the strongest predictors of future offending rates is past offending rates (see Nagin & Paternoster, 1991, 2000) for reviews). For this reason, delinquency and victimization variables will be added to the regression models as controls. *Number of Fights* indicates the number of times an individual ever got into a fight at school and *Number of Items Stolen* measures the number of personal possessions that were stolen in school.

The NLSY97 asked respondents several questions related to offending, alcohol

and drug use. Beginning in Wave 8, only a subset of the entire dataset was asked

offending questions, so the self-report offending variables are only recorded up through

Wave 7; the entire dataset was asked substance abuse questions however. Due to the way

offending variables were measured, a variety offending index (*Cumulative Offending*

Index) captures the six different types of offenses the individual committed, but only

during Waves 1-7. The following offenses are recorded: stealing an item less than $50,

stealing an item greater than $50, destroyed property, committed other property crimes,

attacked/assaulted another individual, and sold illegal drugs. An offending index was

created that represents the maximum variety of offenses an individual ever engaged in

during waves one through seven; values range from zero through six. *Cumulative*

Offending Index is a cumulative total of the variety offending index. For example, if an

individual had variety score index values of one, one, one, four, one, one and one, the

value of the *Cumulative Offending Index* would be would be 10. *Ever Carry Gun* is a

dummy variable that indicates whether an individual carried a gun during any of the first

seven waves.

The NLSY97 has also recorded a handful of peer variables. While there is

theoretical debate as to how these variables should be interpreted, strong evidence exists

regarding the similarity in behavior of an individual's offending patterns and the patterns

of his peers (Hirschi, 1969; Sutherland & Cressey, 1947; Warr, 2002). *Antisocial Peers*

measures whether the individual is friends with peers who engage in antisocial activities.

Five activities are measured, each from a scale of one to five, where higher numbers

indicate more peers who engage in antisocial activities such as cutting class or using

illegal drugs[7]. *Prosocial Peers* is an analogous scale to *Antisocial Peers*, but is comprised of three items that are prosocial such as doing volunteer work or being engaged in school activities.

ANALYTIC STRATEGY

The dependent variable is an individual's total number of arrests over Waves 11-14, a count variable. There are several models that are suited for count data: poisson regression, negative binomial regression and zero-inflated models. The model best suited for this data is the zero-inflated negative binomial regression model. Because these models have many similarities, I will briefly discuss the all three.

The poisson regression model is the most straightforward model for count data. When the mean is low, the distribution is right-skewed. However, as the mean value increases, its distribution resembles the normal distribution. Figure 3.1 shows a histogram of the cumulative frequency of arrest for all data. Figure 3.2 shows a histogram of the cumulative frequency of arrest with zeroes removed. Both show a right-skewed poisson distribution.
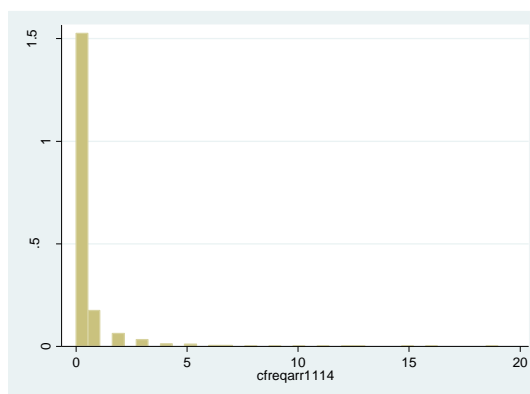
Figure 3.1 Histogram of Cumulative Frequency of Arrests From Waves 11-14, With Zeroes

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[7] 1=less than 10%; 2=about 25%; 3=about 50%; 4=about 75%; 5=more than 90%
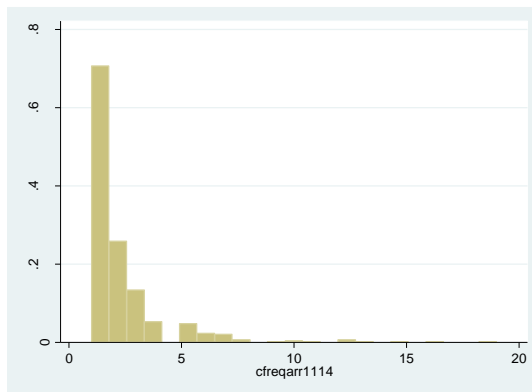
Figure 3.2 Histogram of Cumulative Frequency of Arrests From Waves 11-14, Without Zeroes

The mean value of arrest frequency in Figure 3.1 is 0.364, the standard deviation is 1.181 and the distribution is right-skewed, indicating that a count model is indeed an appropriate model. A problem with the poisson regression model is that its assumption of equidispersion which means the conditional variance of y is equal to the conditional mean of y. This condition rarely exists in practice, however. And if the conditional variance is greater than the mean, then there is overdispersion. If overdispersion exists, estimates that will be inefficient and standard errors will be biased downward, resulting in inflated z-score values (Long, 1997; Osgood, 2000). The negative binomial regression Model, however, is better able to account for overdispersion.

The negative binomial regression model is also a count model except the variation in the mean is due to two factors: variation in the independent variable and unobserved heterogeneity, represented by the error term. Because the variation is due to both these factors, equidispersion is not required by this model. If no heterogeneity exists, then no error term exists and the negative binomial regression model is equivalent to the poisson regression model (Long, 1997; Osgood, 2000).

47

The zero-inflated negative binomial regression model (ZINB) and zero-inflated poisson model (ZIP) are variations of the negative binomial regression model and poisson model respectively. They assume that the zeros in the data exist due to two different causes; that is, two different groups exist within the observed zero's. The first is an 'always zero' group, which means that no matter what, the probability of a zero outcome is always one. The second is a 'not always zero' group, which means that the outcome for this group may be a variety of numbers, and zero is just one of those possible outcomes (Long, 1997; Long & Freese, 2006). The ZINB model accounts for these two groups by combining two different models – a logit equation for the 'always zero' group and a negative binomial equation for the 'not always zero' group (Long & Freese, 2006).

In this dissertation, the 'always zero' group represents all individuals in the sample that have a cumulative frequency of arrest value of zero because they never committed any crimes during all waves surveyed. The second group, the 'not always zero' represents individuals that committed offenses but are not arrested. The variable *Cumulative Offending Index,* is used as the determiner of being in the 'not always zero' group.

A few tests in Stata were performed to confirm that the ZINB was the best fitting model. The first was a likelihood-ratio test, which compares the negative binomial regression model with the poisson regression model (the null hypothesis is that a poisson regression model is the better fit). If the results are statistically significant, that means the two models are indeed significantly different and the negative binomial model is the preferred model (Long & Freese, 2006). The results for the test with my data are

significant (p < 0.001), indicating the negative binomial model was the better fitting model.

The second test was the Vuong test, which compares the zero-inflated model with its non-zero-inflated counterpart. The null hypothesis is that the non-zero-inflated model is the best fitting model, and the alternate hypothesis is that the zero-inflated model is the better fitting model. When the Vuong test was used to compare the ZINB model against the Negative Binomial model, results are again significant (p < 0.001), indicating that the ZINB model was the better fitting model.

The third test was a comparison of Bayesian Information Criterion (BIC) values and Akaike's Information Criterion (AIC) values generated by each regression model using the fitstat output in Stata. The model with the smaller AIC and BIC values is generally considered to be the better-fitting model (Long & Freese, 2006). Table 3.6 shows the BIC and AIC values generated in Stata. Both BIC and AIC values are lowest for the ZINB model, again indicating that the ZINB regression model is the best fitting model.

Table 3.6 BIC and AIC Values Generated by Regression Models

Model	BIC	AIC
Poisson	-17,128	1.70
ZIP	-18,140	1.33
Negative Binomial	-18,237	1.30
ZINB	-18,342	1.25

Chapter 4 Results

Before the hypotheses are tested, I first consider a correlation matrix of all 29 variables to determine the initial relationship variables had with frequency of arrest or if multicollinearity existed among variables. The results are listed in Appendix B; there is no evidence that multicollinearity is a problem. Next, hypotheses are tested in the order presented in Chapter 2. First, I investigate whether educational attainment within the Forgotten Half predicts offending, and whether stopouts and dropouts are arrested more often than high school graduates. Next, social control theory variables are added to the model, thereby testing Hypotheses 2 and 3. Lastly, the effect of identity theory variables on arrest, Hypotheses 4 and 5, are tested. Regressions are also performed for males and females, as well as racial and ethnic groups to check for significant differences across demographic characteristics. (Because only 69 individuals are categorized as 'Other Race,' the regressions looking specifically at effects for racial and ethnic groups are only performed on Black, Hispanic and White racial and ethnic groups; but, for the main regression models, 'Other Race' is included as the reference category).

HYPOTHESIS 1 RESULTS

To test Hypothesis 1, summary statistics are first analyzed. Table 4.1 shows the average arrest rates by educational attainment level. These mean values support Hypothesis 1's argument that a relationship between educational attainment and arrest rates exists, and that the relationship is negative. That is, dropouts are arrested most frequently, stopouts the second-most frequent, and high school graduates the least.

Table 4.1 Summary Statistics for Average Arrest Rate by Educational Attainment Type

Educational Attainment Type	Mean (standard deviation)
Dropout	0.467 (1.280)
Stopout	0.339 (0.947)
High School Graduate	0.196 (0.794)
Total	0.314 (1.012)

Next, a one-way Analysis of Variance (ANOVA) is performed to determine whether the differences in mean arrest rates are significant. Table 4.2 shows that a significant difference does exist between the mean arrest rates among educational attainment types. Tukey's Honest Significant Difference test was then performed post hoc to compare educational attainment pairings. Significant differences in arrest rates existed between all three educational attainment levels. The difference between dropouts and stopouts as well as the difference between stopouts and high school graduates was significant at the $p < 0.05$ level, and the difference between dropouts and high school graduates the most significant, with $p < 0.001$. The ANOVA results show that that differences in mean arrest values are statistically significant between educational attainment levels, and that dropouts' arrest rates are indeed the highest, high school graduates' the lowest, and stopouts' arrest rates falling in the middle.

Table 4.2 One-way ANOVA Results for Frequency of Arrest by Educational Attainment Level

Source	Analysis of Variance			F	Prob > F
	Sum of Squares	Degrees of Freedom	Mean Square		
Between groups	38.244	2	19.122	18.920	0.000
Within groups	2758.668	2729	1.011		
Total	2796.912	2731	1.024		

Finally, a ZINB regression was run to determine the effect of educational attainment at Wave 8 on an individual's cumulative number of arrests during Waves 11-14. The log-odds coefficients are listed in the tables below, but can be interpreted as a per cent by taking the exponent of the coefficient, then subtracting one, and then multiplying that value by 100 to obtain the effect size in percent form (see Pearce & Haynie, 2004) as an example). Model 1 in Table 4.3 shows the results for the effect of just educational attainment variables on future arrest rates. Results again show that educational attainment variables are significantly related to arrest, with dropping out associated with a 95% ($e^{(0.669)} - 1$ x 100) increase[8] and stopping out associated with a 46% increase ($e^{(0.378)} - 1$ x 100) in arrest rates. Graduating from high school is negatively related to arrest; earning a diploma is associated with a 55% decrease ($e^{(-0.798)} - 1$ x 100). Model 2 adds basic demographic control variables – age, gender, race and ethnicity. When these variables are added, we still see that dropping out is associated with the higher arrest rates than stopping out is.

Table 4.3 ZINB Regression Results for Educational Attainment Variables Only on Future Arrest Rates

	Model 1 (n=2,732) Coefficient (se)	Model 2 (n=2,560) Coefficient (se)
Age		-0.149** (0.049
Gender		0.482** (0.157)
Black		-0.237 (0.455)
Hispanic		-0.191 (0.476)
White		-0.257 (0.454)
Dropout	0.669** (0.166)	0.710** (0.160)
Stopout	0.378* (0.177)	0.405* (0.176)
Constant	-0.798** (0.168)	2.746* (1.293)

*$p < 0.05$, **$p < 0.01$ (two-tailed tests)

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[8] Log odds to per cent calculation: ($e^{(0.669)} - 1$) x 100 = 95%

Table 4.4 shows the results of Table 4.3, Model 2 broken down by gender or racial/ethnic group. For all tables with group comparisons, significance tests were run to determine whether differences in dropout and stopout were significant between males and females using the formula $Z = \dfrac{b_1 - b_2}{\sqrt{SEb_1^2 + SEb_2^2}}$ (Paternoster, et al. 1998). If $|Z| > 1.645$, or $p < 0.05$, then the difference was deemed significantly different[9].

Both the effect of dropping out and the effect of stopping out on arrest, when compared to being a high school graduate, are positive and statistically significant. Dropping out is associated with a 95% ($e^{(0.669)} - 1$ x 100) increase in cumulative frequency of arrest in later waves while stopping out is associated with a 46% increase ($e^{(0.378)} - 1$ x 100), less than half that of dropping out.

Table 4.4 shows us that again, dropping out is associated with the highest arrest rates, and stopping out with the next highest arrest rates and both variables are significantly related. Dropping out is a significant predictor of future arrest rates for males, Whites and Hispanics, with the effect size and significance largest for men and Whites; dropping out is associated with a 149% increase ($e^{(0.913)} - 1$ x 100) in future arrest rates for males and a 133% increase ($e^{(0.846)} - 1$ x 100) for Whites. However, there is only a significant difference in the effect of dropping out between men and women; no statistically significant differences among racial or ethnic groups exist. Stopping out is also significant for males and Whites, increasing arrest frequency during Waves 11-14 by 64% ($e^{(0.497)} - 1$ x 100) and 80% ($e^{(0.590)} - 1$ x 100) respectively.

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[9] Significance tests were also performed among different racial and ethnic groups. Six tests were run: one test for Blacks and Hispanics, one Blacks and Whites and one test for Hispanics and Whites; these tests were performed for both dropout and stopout variables. No pairings yielded significant differences at the $p < 0.05$ level though (only $p < 0.10$) level).

Table 4.4 ZINB Regression Results for Educational Attainment Variables on Future Arrest Rates

	Male (n=1,403) Coefficient (se)	Female (n=1,157) Coefficient (se)	Black (n=809) Coefficient (se)	Hispanic (n=643) Coefficient (se)	White (n=1,049) Coefficient (se)
Age	-0.148* (0.057)	-0.125 (0.085)	-0.074 (0.082)	-0.106 (0.102)	-0.169** (0.065)
Gender			1.120** (0.280)	0.344 (0.362)	0.435* (0.202)
Black	0.440 (0.473)	-1.300 (0.691)			
Hispanic	0.269 (0.479)	-0.728 (0.719)			
White	0.261 (0.475)	-0.959 (0.683)			
Dropout	0.913** (0.195)	0.306 (0.281)	0.379 (0.271)	0.628* (0.303)	0.846** (0.226)
Stopout	0.497* (0.208)	0.228 (0.321)	0.339 (0.300)	-0.075 (0.335)	0.590* (0.236)
Constant	2.446 (1.464)	3.583 (2.311)	0.375 (1.934)	1.538 (2.735)	2.990 (1.684)

$*p < 0.05$, $**p < 0.01$ (two-tailed tests)

HYPOTHESIS 2 RESULTS

Table 4.5 tests Hypothesis 2, the contention that social control variables reduces the relationship between educational attainment and arrest. Comparing the effect of dropping out on arrest for Tables 4.3 and 4.4, we can see that the effect has lessened. Without social control variables, dropping out was associated with a 103% increase ($e^{(0.710)} - 1$ x 100) in arrests; in Table 4.5, the magnitude drops to a 72% ($e^{(0.540)} - 1$ x 100) increase, but was still significant at the $p < 0.01$ level. The magnitude of dropping out also decreases for males and Whites, and significance levels decreases as well (from $p < 0.01$ to $p < 0.05$ and from $p < 0.05$ to not significant, respectively). The significant

54

difference between men and women for dropping out disappears. Adding social control variables renders the relationship between stopping out and arrest insignificant, however. When educational attainment variables were evaluated on their own, stopping out was significant at the $p < 0.05$ level for the Forgotten Half overall, for males and for Whites. However, Table 4.5 shows no such relationship between stopping out and arrest for any group, or the overall dataset.

Looking at the social control variables, we can see variation exists among genders and racial/ethnic groups. Only one variable - whether the individual lives with both biological parents - is negatively and significantly related to future arrest rates for the Forgotten Half as a whole. However, results seem to show that overall, there is a great amount of heterogeneity among gender and racial/ethnic groups. Men's Mental Health Index score is significantly related to arrest, with each point increase in score resulting in a 6% decrease ($e^{(-0.063)} - 1$ x 100) in arrest. High school grades earned are significant for both Blacks and Hispanics; however, the result is in the opposite direction from what was expected for Black students. Positive school attitude is significant at the $p < 0.01$ level for Blacks, and in the expected direction.

Overall, the results from Table 4.5 show some support for Hypothesis 2. Social control variables have a moderate effect on future arrest rates; some variables were significantly related to future arrest rates, but this significance only exists for certain groups and does not extend to all genders or racial and ethnic groups. Social control theory's effects are strongest for males and for Blacks. Men's mental health index score and whether they lived with both biological parents are both negatively related to arrest frequency. And high school grades and school attitude are both positive predictors of

55

arrest frequency for Blacks. There is also moderate support for the contention that

introducing social control variables would weaken the relationship between educational

attainment and arrest. While including social control variables do not really change the

effect dropping out has on future arrest rates, the inclusion is much more noticeable for

stopouts. Once social control variables are added to the model, stopping out fails to be

related to arrest for any group.

Table 4.5 ZINB Regression Results for Childhood Social Control Variables on Future
Arrest Rates

	All (n=1,969) Coefficient (se)	Male (n=1,095) Coefficient (se)	Female (n=874) Coefficient (se)	Black (n=617) Coefficient (se)	Hispanic (n=471) Coefficient (se)	White (n=846) Coefficient (se)
Age	-0.204** (0.057)	-0.157* (0.067)	-0.263* (0.119)	-0.083 (0.104)	0.057 (0.111)	-0.210** (0.080)
Gender	0.578** (0.192)			1.277** (0.291)	0.621 (0.381)	0.342 (0.249)
Black	0.460 (0.533)	0.779 (0.640)	0.056 (0.808)			
Hispanic	0.712 (0.542)	0.921 (0.633)	0.682 (0.853)			
White	0.485 (0.533)	0.604 (0.638)	0.467 (0.782)			
Mental Health Index	-0.034 (0.028)	-0.063* (0.029)	0.032 (0.051)	-0.010 (0.041)	-0.038 (0.050)	-0.027 (0.040)
Lives with Both Biological Parents	-0.343* (0.170)	-0.487* (0.191)	-0.117 (0.290)	-0.446 (0.299)	-0.548 (0.320)	-0.178 (0.216)
Mom's Highest Grade	0.020 (0.034)	0.024 (0.041)	0.030 (0.075)	-0.003 (0.063)	0.079 (0.049)	0.000 (0.053)
HS Grades	0.059 (0.060)	0.079 (0.058)	-0.006 (0.090)	0.170* (0.073)	-0.243* (0.099)	0.059 (0.067)
Positive School Attitude	0.052 (0.060)	0.032 (0.073)	0.078 (0.071	0.247** (0.091)	0.057 (0.119)	0.035 (0.075)
# Days	0.007	0.004	0.014	-0.037	-0.009	0.013

Absent	(0.009)	(0.010)	(0.013)	(0.019)	(0.013)	(0.010)
Antisocial Peers	0.038*	0.018	0.069*	0.070*	-0.038	0.025
	(0.017)	(0.020)	(0.033)	(0.030)	(0.032)	(0.025)
Prosocial Peers	-0.038	-0.050	-0.032	-0.091*	-0.056	-0.006
	(0.034)	(0.043)	(0.056)	(0.043)	(0.052)	(0.048)
# Fights	0.063	0.101*	-0.075	0.064	0.048	0.107*
	(0.033)	(0.043)	(0.047)	(0.046)	(0.057)	(0.044)
# Items Stolen	0.081	0.025	0.222*	-0.088	0.126	0.052
	(0.047)	(0.035)	(0.094)	(0.084)	(0.127)	(0.049)
Ever Carry Gun	0.083	0.248	-0.395	-0.173	-0.301	0.234
	(0.151)	(0.179)	(0.295)	(0.279)	(0.319)	(0.201)
Dropout	0.540**	0.745**	0.347	0.347	0.576	0.623*
	(0.190)	(0.237)	(0.304)	(0.335)	(0.336)	(0.259)
Stopout	0.323	0.291	0.539	0.408	-0.148	0.505
	(0.219)	(0.239)	(0.362)	(0.379)	(0.378)	(0.277)
Constant	2.666	2.392	3.242	-1.072	-1.077	3.313
	(1.542)	(1.835)	(2.557)	(2.903)	(2.747)	(1.892)

$*p < 0.05$, $**p < 0.01$ (two-tailed tests)

HYPOTHESIS 3 RESULTS

Table 4.6 tests Hypothesis 3, which states that social bonds during adulthood will further reduce the effect of educational attainment variables on arrest. If an adult who had weak social bonds as a child and engaged in higher rates of delinquency obtained stable employment, we would expect his or her arrest rates to decrease and the significance of dropping out or stopping out to diminish. Looking at Table 4.6, we can see that when adulthood job and marriage variables are added to the model, the effect of dropping out on arrest diminishes. Dropping out remains a significant predictor for males only, but its significance drops from $p < 0.01$ to $p < 0.05$, and its magnitude has decreased 149% from $(e^{(0.913)} - 1 \times 100)$ to 64% $(e^{(0.492)} - 1 \times 100)$. Still, the effect of dropping out for males is significantly different than the effect of dropping out on future arrest rates for females. Stopping out continues to remain an insignificant predictor of future arrest rates.

Including adult social control variables does not lessen the effect the childhood variables had with arrest though.

Looking at the adult social control variables, we can see that both employment variables are significantly related to arrest rates at the $p < 0.01$ level, and in the expected direction. Working full-time is inversely related to arrest for both men and women as well as Whites. And working in an unskilled profession increases arrest rates for Whites and Hispanics, increasing arrest rates by 195% ($e^{(1.082)} - 1$ x 100). However, neither marriage nor family variable are significant predictors of arrest. Being married is a significant predictor of arrest for females, but in the opposite direction expected, increasing arrest rates by 101% ($e^{(0.697)} - 1$ x 100).

Table 4.6 ZINB Regression Results for Adulthood Social Control Variables on Future Arrest Rates

	All (n=1,890) Coefficient (se)	Male (n=1,037) Coefficient (se)	Female (n=853) Coefficient (se)	Black (n=592) Coefficient (se)	Hispanic (n=447) Coefficient (se)	White (n=816) Coefficient (se)
Age	-0.228** (0.060)	-0.160* (0.075)	-0.308** (0.114)	-0.083 (0.107)	0.021 (0.117)	-0.202* (0.086)
Gender	0.610** (0.210)			1.286** (0.281)	0.815* (0.335)	0.266 (0.276)
Black	0.463 (0.514)	0.779 (0.656)	0.407 (0.657)			
Hispanic	0.644 (0.513)	0.931 (0.644)	0.393 (0.732)			
White	0.482 (0.508)	0.620 (0.649)	0.731 (0.649)			
Mental Health Index	-0.034 (0.028)	-0.061 (0.031)	0.013 (0.047)	-0.019 (0.041)	-0.044 (0.051)	-0.039 (0.041)
Lives with Both Biological Parents	-0.359* (0.170)	-0.461* (0.193)	-0.143 (0.304)	-0.453 (0.304)	-0.534 (0.336)	-0.156 (0.218)
Mom's Highest	0.156 (0.034)	0.016 (0.039)	-0.004 (0.073)	0.005 (0.064)	0.028 (0.053)	0.003 (0.055)

Grade						
HS	0.038	0.048	0.059	0.117	-0.208	0.034
Grades	(0.053)	(0.062)	(0.094)	(0.075)	(0.108)	(0.073)
Positive	0.079	0.013	0.188*	0.261**	0.207	0.018
School	(0.063)	(0.076)	(0.074)	(0.094)	(0.121)	(0.083)
Attitude						
# Days	0.007	0.007	0.010	-0.055*	0.003	0.009
Absent	(0.008)	(0.011)	(0.014)	(0.022)	(0.013)	(0.009)
Antisocial	0.045**	0.007	0.104**	0.067*	-0.005	0.026
Peers	(0.017)	(0.021)	(0.032)	(0.032)	(0.029)	(0.025)
Prosocial	-0.225	-0.032	0.002	-0.079	-0.003	0.009
Peers	(0.036)	(0.044)	(0.059)	(0.047)	(0.062)	(0.051)
# Fights	0.055	0.082*	-0.008	0.062	0.081	0.086
	(0.032)	(0.041)	(0.042)	(0.043)	(0.052)	(0.045)
# Items	0.068	-0.000	0.149	-0.079	0.078	0.041
Stolen	(0.045)	(0.034)	(0.086)	(0.082)	(0.130)	(0.053)
Ever	0.020	0.190	-0.314	-0.331	-0.486	0.204
Carry	(0.163)	(0.182)	(0.276)	(0.276)	(0.359)	(0.217)
Gun						
Dropout	0.245	0.492*	-0.278	0.270	-0.125	0.401
	(0.197)	(0.245)	(0.333)	(0.360)	(0.332)	(0.270)
Stopout	0.089	0.118	0.147	0.284	-0.397	0.219
	(0.214)	(0.234)	(0.361)	(0.370)	(0.408)	(0.274)
Works	-0.528**	-0.393*	-0.842**	-0.439	0.038	-0.600**
Full-time	(0.157)	(0.182)	(0.289)	(0.260)	(0.315)	(0.212)
Unskilled	0.503**	0.441	0.650*	0.123	1.082**	0.532*
Profession	(0.175)	(0.234)	(0.259)	(0.316)	(0.358)	(0.243)
Married	0.235	-0.244	0.697**	0.287	-0.134	0.091
	(0.218)	(0.355)	(0.268)	(0.352)	(0.430)	(0.295)
#	-0.053	-0.098	0.065	-0.057	0.018	-0.109
Children	(0.089)	(0.161)	(0.121)	(0.121)	(0.198)	(0.129)
Constant	3.035	2.874	3.123	-0.563	-1.967	3.503
	(1.553)	(1.886)	(2.567)	(2.939)	(2.800)	(2.020)

*$p < 0.05$, **$p < 0.01$ (two-tailed tests)

HYPOTHESIS 4 RESULTS

Tables 4.7 shows the regression results that test Hypothesis 3, the effect of childhood identity theory variables on future arrest rates. Identity theory argues that it is the strength of one's future vision of self and identity that is most strongly related to future arrest rates, not the educational attainment level itself. Certain school programs

like a college prep or vocational program can help foster or mirror an individual's identity, whereas programs like covocational or 'other' school programs are more likely to be indicators of a weaker vision of future self.

Examining the effect identity theory variables have on the relationship between educational attainment and arrest, we can see that the effect of dropping out reduces slightly from 103% ($e^{(0.710)}$ – 1 x 100) to 92% ($e^{(0.653)}$ – 1 x 100), but is still significant at the $p < 0.01$ level. Dropping out remains significant for males, Hispanics and Whites, at roughly the same magnitude and significance as in Table 4.3. Like the results in Table 4.5, when identity theory constructs are added to the basic educational attainment model, the relationship between stopping out and arrest fails to remain significant.

Evaluating the effect of the identity variables, we see that none of the school programs are significantly related to arrest for the Forgotten Half overall. However, three of the programs are significant predictors for Black students. Being enrolled in a vocational, covocational or 'other' school program is significantly related with arrest and in the expected direction. A vocational program, which could foster the identity of a worker, rather than a student, is negatively related to arrest rates. On the other hand, being enrolled in covocational or 'other' program provide little in the way of future identity possibilities, and these two programs are positively related to arrest frequency.

Table 4.7 ZINB Regression Results for Childhood Identity Theory Variables on Future Arrest Rates

	All (n=2,158) Coefficient (se)	Male (n=1,219) Coefficient (se)	Female (n=939) Coefficient (se)	Black (n=631) Coefficient (se)	Hispanic (n=529) Coefficient (se)	White (n=950) Coefficient (se)
Age	-0.193**	-0.153*	-0.254*	-0.183	0.017	-0.197*
	(0.058)	(0.068)	(0.103)	(0.095)	(0.093)	(0.082)
Gender	0.570**			0.987**	0.498	0.500*
	(0.168)			(0.276)	(0.372)	(0.215)
Black	-0.171	0.240	-0.872			
	(0.376)	(0.500)	(0.682)			
Hispanic	-0.246	-0.053	-0.463			
	(0.393)	(0.514)	(0.688)			
White	-0.323	-0.090	-0.566			
	(0.371)	(0.506)	(0.642)			
College Prep Program	-0.207	0.015	-0.536	0.032	-0.124	-0.357
	(0.185)	(0.208)	(0.367)	(0.285)	(0.289)	(0.274)
Vocational Program	-0.072	-0.192	0.209	-0.480*	0.225	-0.137
	(0.169)	(0.206)	(0.289)	(0.229)	(0.396)	(0.220)
Covocational Program	0.041	0.159	-0.099	0.775**	-0.489	-0.155
	(0.171)	(0.211)	(0.281)	(0.278)	(0.354)	(0.239)
Other School Program	0.384	0.562	0.078	1.087**	-0.476	-0.025
	(0.296)	(0.415)	(0.419)	(0.536)	(0.489)	(0.385)
Worked Intensely	0.316	0.386	0.008	0.619	0.2881	0.255
	(0.305)	(0.382)	(0.498)	(0.317)	(0.428)	(0.487)
Antisocial Peers	0.030	0.009	0.072*	0.047	-0.010	0.021
	(0.016)	(0.019)	(0.029)	(0.026)	(0.030)	(0.023)
Prosocial Peers	-0.044	-0.060	-0.037	-0.051	-0.036	-0.013
	(0.031)	(0.038)	(0.056)	(0.041)	(0.046)	(0.042)
# Fights	0.073*	0.090*	0.036	0.069*	0.049	0.106**
	(0.030)	(0.042)	(0.049)	(0.035)	(0.070)	(0.038)
# Items Stolen	0.034	-0.005	0.019	-0.189*	0.028	0.055
	(0.043)	(0.042)	(0.087)	(0.086)	(0.116)	(0.059)
Ever Carry Gun	0.066	0.264	-0.499	-0.073	-0.122	0.044
	(0.145)	(0.173)	(0.260)	(0.264)	(0.272)	(0.201)
Dropout	0.653**	0.916**	0.272	0.342	0.700*	0.773**
	(0.169)	(0.203)	(0.305)	(0.231)	(0.314)	(0.233)
Stopout	0.317	0.354	0.311	0.521	-0.093	0.474
	(0.192)	(0.208)	(0.352)	(0.301)	(0.322)	(0.250)
Constant	3.331*	2.597	5.525*	2.477	-1.557	3.108
	(1.426)	(1.681)	(2.645)	(2.200)	(2.340)	(2.052)

*p < 0.05, **p < 0.01 (two-tailed tests)

Table 4.8 tests Hypothesis 5, which states that introducing adult identity variables will further reduce the effect educational attainment has on future arrest rates. Evaluating the results from Table 4.8 first, we can see that adding adult identity theory variable has weakened the effect dropping out has on arrest. Whereas dropping out was associated with a 92% increase ($e^{(0.653)} - 1$ x 100) in arrest frequency in the childhood identity theory model and significant at the $p < 0.01$ level, when adult variables are added, the effect of dropping out decreases to 48% ($e^{(0.390)} - 1$ x 100). Stopping out remains insignificantly related to arrest, its magnitude decreasing. Because the school program variables were already not significant for the Forgotten Half overall in Table 4.7, it is not surprising that adding adult identity theory variables does not change the significance. Evaluating school programs for Black individuals, being enrolled in a vocational program remained significant and its magnitude even increased slightly. Being in a covocational program is still positively related to future arrest rates at the $p < 0.01$ level, its magnitude decreasing from 117% to 112% (from ($e^{(0.775)} - 1$ x 100) to ($e^{(0.751)} - 1$ x 100). However, being enrolled in an 'other' school program does not remain significant. While working intensely during adolescence was not significant in Table 4.7, the childhood identity theory model, when adult work variables were added, adolescent work becomes significantly and positively related to arrest rates. Overall, results from Table 4.8 show support for the significance of the worker identity for Black individuals, but no other group.

Looking at the adult job and marriage variables themselves, both job and employment variables are significantly related to future arrest rates. Working full-time is

significant at the $p < 0.01$ level and associated with a 48% decrease ($e^{(0.390)} - 1$ x 100) in

arrest rates. This is the strongest predictor of future arrest rates, significant for all groups

except Hispanics. The effect of working in an unskilled profession is not as strong

compared to the results from Table 4.6, the adult social control model. Neither of the

adult marriage and family variables are related to arrest rates though. Being married is

significantly related to arrest for women, but in the positive direction; neither variable is

significant for any other group though.

Table 4.8 ZINB Regression Results for Adulthood Identity Theory Variables on Future Arrest Rates

	All (n=2,057) Coefficient (se)	Male (n=1,149) Coefficient (se)	Female (n=908) Coefficient (se)	Black (n=603) Coefficient (se)	Hispanic (n=498) Coefficient (se)	White (n=909) Coefficient (se)
Age	-0.228**	-0.173*	-0.304**	-0.202*	-0.035	-0.209*
	(0.060)	(0.072)	(0.107)	(0.102)	(0.089)	(0.084)
Gender	0.647**			1.251**	0.721*	0.430
	(0.188)			(0.280)	(0.343)	(0.242)
Black	0.179	0.320	0.071			
	(0.355)	(0.491)	(0.532)			
Hispanic	0.173	0.165	0.105			
	(0.364)	(0.507)	(0.587)			
White	0.071	0.038	0.308			
	(0.348)	(0.496)	(0.470)			
College Prep Program	-0.190	0.087	-0.604	0.139	-0.047	-0.354
	(0.180)	(0.206)	(0.345)	(0.292)	(0.309)	(0.268)
Vocational Program	-0.155	-0.160	-0.080	-0.538*	0.001	-0.086
	(0.173)	(0.212)	(0.295)	(0.236)	(0.419)	(0.227)
Covocational Program	0.075	0.112	0.075	0.751**	-0.636	-0.119
	(0.181)	(0.214)	(0.328)	(0.274)	(0.343)	(0.246)
Other School Program	0.365	0.709	-0.168	1.171	-0.311	0.094
	(0.316)	(0.423)	(0.444)	(0.657)	(0.514)	(0.399)
Worked Intensely	0.282	0.410	0.011	0.706*	0.129	0.359
	(0.300)	(0.396)	(0.462)	(0.351)	(0.444)	(0.478)
Antisocial Peers	0.033*	0.07	0.083**	0.048	0.004	0.022
	(0.016)	(0.019)	(0.027)	(0.027)	(0.032)	(0.023)
Prosocial Peers	-0.037	-0.053	-0.015	-0.053	-0.001	-0.011
	(0.033)	(0.041)	(0.056)	(0.046)	(0.050)	(0.0444)
# Fights	0.068*	0.069	0.080	0.067	0.092	0.087*

	(0.029)	(0.037)	(0.051)	(0.037)	(0.073)	(0.036)
# Items Stolen	0.032	-0.034	0.009	-0.165*	-0.017	0.051
	(0.044)	(0.042)	(0.088)	(0.075)	(0.106)	(0.063)
Ever Carry Gun	0.032	0.224	-0.317	-0.226	-0.066	0.043
	(0.155)	(0.181)	(0.293)	(0.262)	(0.304)	(0.214)
Dropout	0.390*	0.774**	-0.257	0.061	0.257	0.595*
	(0.183)	(0.222)	(0.322)	(0.276)	(0.331)	(0.253)
Stopout	0.118	0.215	0.017	0.366	-0.113	0.230
	(0.190)	(0.211)	(0.354)	(0.308)	(0.346)	(0.254)
Work Full-time	-0.664**	-0.501**	-1.054**	-0.666*	-0.186	-0.630**
	(0.151)	(0.179)	(0.296)	(0.264)	(0.262)	(0.204)
Unskilled Profession	0.338*	0.338	0.388	0.078	0.593	0.363
	(0.156)	(0.191)	(0.281)	(0.240)	(0.303)	(0.213)
Married	0.182	-0.210	0.570*	0.270	-0.107	0.076
	(0.203)	(0.308)	(0.268)	(0.363)	(0.420)	(0.276)
# Children	-0.090	-0.102	-0.042	0.038	0.016	-0.136
	(0.088)	(0.148)	(0.135)	(0.134)	(0.214)	(0.127)
Constant	3.930*	3.090	5.819*	2.927	-0.947	3.515
	(1.538)	(1.838)	(2.792)	(2.295)	(2.237)	(2.189)

$*p < 0.05$, $**p < 0.01$ (two-tailed tests)

ADDITIONAL ANALYSES

I also conducted two supplementary analyses that are worthy of note. First, previous literature focused on offending and dropout has found variations in offending after dropping out depended on the reason the individual left school (Jarjoura, 1993, 1996; Sweeten et al., 2009). This dissertation also wanted to examine the effect the individual left school had on arrest rates for dropouts and stopouts, given that the reasons may be reflective of identity. However, because it evaluated the relationship between arrest and educational attainment for the entire Forgotten Half, assessing the effect of the individual the reason left school only applied to a subset of this dissertation, making the number of observations much smaller (just slightly more than half of the original dataset.) Due to the dramatic reduction in number of observations, the results are shown here in the additional analyses section.

Five dummy variables were created to record the most recent reason an individual left school; all are binary variables and the reasons apply only to stopouts and dropouts. The five categories are: whether the individual *Left for Family Reasons* (left for personal or family reasons)*, Left for Job Reasons* (left for financial or job-related reasons), *Left for Negative School Reasons* (left for negative reasons related to school)*, Left for Logistical Reasons* (left for logistical reasons related to school such as transportation problems)*,* and *Left for Other Reasons*, where *Left for Other Reasons,* which is the reference category.

Table 4.9 shows effects the reason an individual left school and school program he or she was enrolled in had on future arrest rates during childhood. As a reminder, because high school graduates are not relevant to this inquiry, the sample is reduced to focus only on dropouts and stopouts (note that stopping out is the reference category). Model 1, which incorporates reasons the individual left school, shows that leaving for negative reasons related to school and leaving for reasons 'other' reasons were both significantly related to future arrest rates. When school program type is added in Model 2, none of the school program variables have a significant effect on arrest. However, the significance of the reason an individual left school has changed. Leaving for logistical reasons is now significantly related to arrest rates, while leaving for 'other' reasons is not. Leaving for negative school reasons is the only variable to remain significant. These three reasons for leaving all point to the pattern that exists between leaving school with a weak identity and having increased arrest raters in the future, which provides some supplemental commentary for Hypothesis 4. The magnitude and significance of dropping out has also been reduced, when compared with the results from Table 4.3 in the main document. The only finding that is opposite from what identity theory would hypothesize

is leaving for family reasons, which is positively and significantly related to future arrest rates. However, this result is consistent with Jarjoura's (1993) findings, which found that leaving for personal reasons was positively related to future violent offending.

Table 4.9 ZINB Regression Results for Childhood Identity Theory Variables on Future Arrest Rates, Dropouts and Stopouts Only

	Model 1 (n=1,390) Coefficient (se)	Model 2 (n=1,143) Coefficient (se)
Age	-0.07 (0.056)	-0.018 (0.063)
Gender	0.632** (0.175)	0.723** (0.191)
Black	-0.015 (0.519)	0.276 (0.545)
Hispanic	-0.016 (0.531)	0.118 (0.555)
White	0.092 (0.517)	0.254 (0.536)
Left School for Family Reasons	0.565 (0.416)	0.935* (0.476)
Left School for Job Reasons	-0.165 (0.708)	-0.057 (0.485)
Left for Negative School Reasons	0.812** (0.270)	0.959** (0.340)
Left School for Logistical Reasons	0.547 (0.302)	0.724* (0.366)
Left School for Other Reasons	0.713* (0.315)	0.650 (0.386)
College Prep Program		-0.107 (0.249)
Vocational Program		0.337 (0.208)
Covocational Program		0.080 (0.255)
Other School Program		0.295 (0.295)
Worked Intensely		0.132 (0.387)
Dropout	0.350* (0.158)	0.389* (0.166)
Constant	-1.518 (1.450)	-1.872 (1.781)

*p < 0.05, **p < 0.01 (two-tailed tests)

Table 4.10 includes the adult identity theory variables. Here, we can see that both employment variables are significantly related to future arrest rates, in the expected direction, at a $p < 0.01$ level of significance. In Models 1 and 2, the weak identity reasons an individual left school are still significant, and the coefficients are even larger than in Model 1. Two family-related variables show a significant relationship to future arrest rates as well. In Model 1, being married is also significantly related to arrest. Leaving school for family reasons in Model 2 is highly significant, increasing future arrest rates

by 261% ($e^{(1.283)} - 1$ x 100). However, in both cases, the relationship is in the opposite

direction from what we would expect.

Table 4.10 ZINB Regression Results for Adulthood Identity Theory Variables on Future
Arrest Rates, Dropouts and Stopouts Only

	Model 1 (n=1,321) Coefficient (se)	Model 2 (n=1,081) Coefficient (se)
Age	-0.043 (0.061)	-0.073 (0.069)
Gender	0.764** (0.182)	0.866** (0.204)
Black	0.455 (0.346)	0.688 (0.249)
Hispanic	0.439 (0.492)	0.613 (0.596)
White	0.529 (0.477)	0.694 (0.586)
Left School for Family Reasons	0.700 (0.402)	1.283** (0.445)
Left School for Job Reasons	0.136 (0.493)	0.489 (0.519)
Left for Negative School Reasons	0.721** (0.260)	1.010** (0.304)
Left School for Logistical Reasons	0.709* (0.302)	1.045** (0.342)
Left School for Other Reasons	0.868** (0.311)	0.994** (0.365)
College Prep Program		-0.207 (0.234)
Vocational Program		-0.141 (0.220)
Covocational Program		0.233 (0.362)
Other School Program		-0.055 (0.270)
Worked Intensely		-0.014 (0.381)
Dropout	0.316* (0.160)	0.281 (0.172)
Work Full-time	-0.688** (0.165)	-0.903** (0.182)
Unskilled Profession	0.695** (0.160)	0.656** (0.170)
Married	0.470* (0.186)	0.354 (0.207)
# Children	-0.106 (0.079)	-0.097 (0.091)
Constant	-1.431 (1.598)	-1.131 (1.895)

*$p < 0.05$, **$p < 0.01$ (two-tailed tests)

Second, I also investigated whether adult employment and family variables

weaken the relationship between educational attainment and arrest because they serve as

mediators. While there are more sophisticated methods of testing mediating effects, such

as bootstrapping (Preacher, Rucker, & Hayes, 2007) or Structural Equation Modeling

(Guo & Harris, 2000), the analyses performed here are intended as a simple, preliminary

investigation. The models employed to test this relationship are a series of regressions

67

designed to test all relationships involving educational attainment, adult variables, and arrest frequency (Baron & Kenny, 1986). The first regression used to determine mediation will be Table 4.3, which compared the effect educational attainment had on arrest, including only basic controls. As discussed earlier, this demonstrated a clear relationship between educational attainment and arrest. Next, extant analyses also investigated the effect of these possible mediating variable(s) on future arrest rates. The inclusion of these variables reduced the relationship between educational attainment and arrest, and two of them predicted arrest (working full-time and unskilled work). Therefore, I also considered the effect of educational attainment on these adult mediating variable, shown here in Tables 4.11 and 4.12 (one model includes social control constructs as controls, the other includes identity theory constructs as controls).

Logistic regressions were performed to determine the effect of educational attainment on full-time work, unskilled profession and married, net of basic controls like individual demographic and offending correlates. The number of children is a count variable that is slightly overdispersed ($\mu = 0.771$, $\sigma = 1.049$), so a negative binomial regression was performed for this outcome. Results in Tables 4.11 and 4.12 show the slope and odds ratios for binary outcome variables, and slope and incidence rate ratios for the count variable number of children.

Both tables reveal that educational attainment predicts full-time employment. The tables also offer some evidence that educational attainment predicts unskilled labor, as well as the number of children an individual has. There is no evidence that educational attainment predicts marriage in this sample. Because the number of children as subject has did not have a relationship with arrest, it does not serve as a mediator. In contrast,

these results offer some (very) preliminary evidence that employment (measured both as full-time and unskilled) may mediate the relationship between educational attainment and later arrest.

Table 4.11 Regression Results for Effect of Educational Attainment on Adult Variable Outcomes, with Social Control Variables

	Full-time Work (n=1,957) Coefficient (se)	Unskilled Profession (n=1,969) Coefficient (se)	Married (n=1,969) Coefficient (se)	# Children (n=1,901) Coefficient (se)
Age	1.121* (0.049)	0.957 (0.040)	1.224** (0.063)	1.079** (0.027)
Black	0.400* (0.157)	0.801 (0.292)	0.484 (0.241)	0.904 (0.203)
Hispanic	0.907 (0.364)	0.701 (0.260)	1.449 (0.701)	0.811 (0.186)
White	0.687 (0.267)	0.910 (0.326)	2.059 (0.987)	0.762 (0.170)
Antisocial Peers	0.990 (0.013)	0.977 (0.012)	0.973 (0.015)	1.018* (0.007)
Prosocial Peers	1.011 (0.025)	1.008 (0.024)	0.999 (0.027)	1.104 (0.014)
# Fights	0.981 (0.025)	1.001 (0.024)	0.970 (0.034)	1.000 (0.013)
# Items Stolen	1.028 (0.042)	1.091 (0.050)	0.976 (0.042)	0.993 (0.022)
Ever Carry Gun	1.131 (0.135)	1.337* (0.155)	0.960 (0.131)	0.645** (0.048)
Mental Health Index	1.112** (0.023)	1.050* (0.020)	0.998 (0.023)	0.974* (0.011)
Lives with Both Biological Parents	1.210 (0.140)	1.073 (0.120)	1.304* (0.170)	0.972 (0.066)
Highest Grade Earned by Mom	1.046 (0.026)	0.997 (0.023)	0.902** (0.024)	0.947** (0.013)
High School Grades	0.972 (0.036)	0.913* (0.033)	1.012 (0.043)	1.065** (0.023)
Positive School Attitude	1.026 (0.039)	1.006 (0.036)	0.914* (0.039)	0.994 (0.021)
# Days Absent	0.994** (0.006)	1.007 (0.006)	1.007 (0.006)	1.005 (0.029)
Dropout	0.467** (0.066)	1.357* (0.184)	0.825 (0.138)	1.414** (0.110)
Stopout	0.667** (0.096)	1.269 (0.177)	0.935 (0.154)	1.284** (0.107)
Constant	0.023** (0.029)	3.489 (4.148)	0.009** (0.012)	0.191* (0.132)

*p < 0.05, **p < 0.01 (two-tailed tests)

Table 4.12 Regression Results for Effect of Educational Attainment on Adult Variable Outcomes, with Identity Variables

	Full-time Work (n=2,146) Coefficient (se)	Unskilled Profession (n=2,158) Coefficient (se)	Married (n=2,158) Coefficient (se)	# Children (n=1,901) Coefficient (se)
Age	1.151** (0.050)	0.936 (0.038)	1.203** (0.060)	1.070** (0.026)
Black	0.499* (0.158)	1.024 (0.323)	0.405* (0.165)	0.818 (0.160)
Hispanic	1.017 (0.326)	0.915 (0.291)	1378 (0.544)	0.853 (0.168)
White	0.811 (0.252)	1.130 (0.349)	1.499 (0.580)	0.734 (0.142)
Antisocial Peers	0.976* (0.012)	0.973* (0.011)	0.989 (0.013)	1.023** (0.007)
Prosocial Peers	0.995 (0.023)	0.999 (0.022)	0.987 (0.025)	1.008 (0.013)
# Fights	0.979 (0.028)	1.038 (0.037)	0.973 (0.033)	1.018 (0.016)
# Items Stolen	1.004 (0.034)	1.076 (0.045)	0.976 (0.046)	0.972 (0.023)
Ever Carry Gun	1.225 (0.140)	1.335** (0.148)	0.924 (0.118)	0.649** (0.047)
College Prep	1.118 (0.138)	0.787* (0.091)	1.127 (0.153)	0.894 (0.066)
Vocational Program	0.803 (0.099)	0.978 (0.119)	1.169 (0.172)	0.976 (0.074)
Covocational Program	1.051 (0.141)	0.952 (0.126)	0.671* (0.110)	0.831* (0.071)
Other School Program	0.590* (0.128)	1.004 (0.226)	0.547* (0.160)	0.905 (0.126)
Worked Intensely	1.265 (0.206)	1.167 (0.188)	0.926 (0.186)	0.880 (0.085)
Dropout	0.409** (0.051)	1.263 (0.155)	0.887 (0.129)	1.407** (0.101)
Stopout	0.623** (0.082)	1.290* (0.167)	0.899 (0.135)	1.134 (0.091)
Constant	0.104* (0.117)	7.570 (8.029)	0.004** (0.005)	0.145** (0.094)

*p < 0.05, **p < 0.01 (two-tailed tests)

Chapter 5 Conclusions and Discussion

This dissertation was focused on exploring the relationship between educational attainment and arrest rates for those individuals who did not pursue college. In doing so, it explored the variability that existed within the Forgotten Half, looking at three groups: dropouts, stopouts and high school graduates. Much of previous research has looked either at the effect of dropping out, or combined stopouts with either dropouts or high school graduates. This dissertation is one of the first studies that has differentiated groups within the Forgotten Half, examining whether the effect of educational attainment was relatively uniform for all individuals that did not pursue college or instead was varied across different categories where criminal outcomes were concerned.

I hypothesized that a relationship existed between educational attainment and arrest, with dropouts having the highest arrest rates, high school graduates the lowest, and stopouts falling somewhere in the middle. I also proposed that once social control and identity theory constructs were added to the models, the relationship between educational attainment and arrest would weaken. To investigate these propositions, I relied on data from the first 14 waves of the NLSY97. These data had the advantage of capturing sufficient numbers of people who have dropped out of high school, stopped out of high school, and obtained a high school degree to track differences in later offending patterns. Moreover, the data contained information on an array of both social control and identity concepts, measured both in childhood and (young) adulthood. By leveraging such rich data, this dissertation could investigate more deeply the relationship between being in the Forgotten Half and offending behavior.

When accounting for basic controls, I found support for my first hypothesis. Dropping out, stopping out, and graduating from high school each had different relationships with future arrest rates, and ANOVA analysis showed these differences to be statistically significant. Graduating from high school was associated with the lowest arrest rates, stopouts with the next lowest, and dropouts with the highest arrest rates. Dropping out was significantly related to future arrest rates at the $p < 0.01$ level, and stopping out at the $p < 0.05$ level. The magnitude for dropping out was also larger than for stopping out. When separate regressions were run for each gender and racial/ethnic group, dropout continued to be significantly related to arrest for males, Hispanics and Whites. Stopping out, on the other hand, was only significantly related to arrest for men and Whites. Still, the difference in magnitude persisted – dropping out increased future arrest rates more than stopping out for males and Whites.

This finding is significant because it highlights the differences among educational attainment groups when it comes to explaining their effect on arrest rates. Prior literature on the crime and the Forgotten Half only considered two distinctions. The first distinction compares outcomes for those in the Forgotten Half versus those not in the Forgotten Half. The second compares outcomes for just one group within the Forgotten Half, such as dropouts versus nondropouts (Jarjoura, 1993, 1996). This dissertation argues that dropouts, stopouts and high school graduates should be treated as distinct groups. The findings in Chapter 4 show that the Forgotten Half are not a uniform group where arrest is concerned. And this suggestion of disaggregation also complements the work of scholars who have found three distinct groups to exist within the Forgotten Half when

outcomes such as employment are considered (Cameron & Heckman, 1993; Murnane et al., 1995).

Policy would similarly recommend that treating the Forgotten Half as one monolith is unwise and an inefficient use of resources. Arrest rates for dropouts, stopouts and high school graduates are different. Tailoring policy for these different groups is therefore a better strategy. Creating programs targeted at reducing arrest for dropouts would yield the best bang for the buck, as dropouts were arrested the most frequently and more consistently across models.

Next, I tested whether the relationship between educational attainment and arrest would change when theoretical constructs related to social control or identity theory were added to the model. The first notable finding is that when theoretical constructs were added during childhood, the effects for dropping out and stopping out behaved differently. When childhood social control or identity variables were added, stopping out failed to have a significant relationship with arrest. The relationship significance between dropping out and arrest, on the other hand, remained largely the same, across race and gender. However, effect sizes did decrease, illustrating the effect identity had in explaining the relationship between educational attainment and arrest.

When adult social control variables were added to the model, dropping out only remained a significant predictor for males, though the effect reduced in magnitude. Stopping out continued to be an insignificant predictor of arrest across all groups. The introduction of adult identity variables affected the significance of educational attainment on arrest slightly. Like the adulthood social control model, though, the effect of dropping out on arrest reduced for all three groups.

Several theoretical implications emerge from these findings. Social control theory implications will be discussed first. We can see from the results in Chapter 4 that accounting for social bonds weakens the relationship between educational attainment and arrest. Accounting for additional bonds in adulthood had a similar effect, further reducing the impact educational attainment has on future arrest rates. This diminished impact implies that once social control theory's relationship with adult arrest, and the shared variation it has with educational attainment, is taken into account, the relationship between educational attainment and arrest weakens. Therefore, scholars who fail for account for social bonds when studying the relationship between educational attainment and offending may be overestimating the relationship due to omitted variable bias. These findings also underscore the theoretical importance of social bonds to conventional institutions when studying offending pathways.

Turning our attention now to identity theory, we find that introducing school program and opportunity for future identity formulation makes the relationship between stopping out and arrest insignificant. During adulthood, accounting for employment identity weakens the relationship, but it does not render it insignificant. Overall, these findings offer lessons similar to social bonds'. Because the relationship between educational attainment and arrest changes in notable ways once identity is taken into account, this suggests that research on education and offending that fails to account for such concepts may also suffer from omitted variable bias. These findings also reiterate the statements of other scholars who argue the importance of identity in predicting and explaining offending patterns (Paternoster & Bushway, 2009).

Overall, models that included social control or identity theory constructs had similar results. Both showed that they are influence future arrest rates by having a significant relationship with arrest and in reducing the effect of dropping and stopping out. Social control models did reduce the effects more than identity theory models, indicating that social bonds have a stronger effect on arrest rates than identity strength as far as educational attainment and arrest are concerned. Future research should examine the relationship between this social control, identity theory and educational attainment further, examining the effect of theoretical variables on offending and arrest rates. Future studies could see if social bonds remained stronger predictors of arrest than identity theory if other theoretical constructs were used in models. Future research could also incorporate both social control and identity theory variables in the same models to see if results were like findings here.

This dissertation also examined the contention that differences in arrest and independent variables might exist across gender, which was confirmed. The most basic regression showed that dropping out and stopping out were significantly related to future arrest rates for males ($p < 0.01$ and $p < 0.05$ respectively), but neither educational attainment level was significant for females. When social control constructs were added to the model, dropout was only significantly related to arrest for men. Educational attainment levels continued to have no relationship with arrest rates if the individual was a woman. Differences also existed regarding the strength of social control variables – some variables such as living with both biological parents were significantly related to future arrest rates for men, but again failed to be significant for women. This changed in the adulthood model though – three of the four variables are significantly related to arrest

75

for females, whereas only one is significant for males. Identity models revealed gender differences like those in the social control models – dropout was significantly and positively related to arrest for males, but not females. And in adulthood, more adult identity variables were significant predictors of arrest for females than for males, although this time it was only two variables (working full-time and being married). In the end, these results suggest that just as one should not make assumptions about the 'Forgotten Half' in wholesale terms, nor should they assume that the relationship between the Forgotten Half and delinquency, including the mechanisms that may connect them to each other, operates in the same way for men and women.

Racial and ethnic differences existed as well. Dropping out and stopping out were significantly related to arrest for Whites in the basic regression model, only dropping out was significantly for Hispanics and neither educational attainment level was significantly related to arrest for Blacks. Some of the more notable findings were the effect school variables had on arrest for Black individuals. Social control variables such as positive school attitude and identity variables such as being enrolled in a covocational program, were significantly related to arrest rates, even though neither educational attainment variable was not. Additional results also suggested that the theoretical constructs of interest also behaved in different ways across race. For example, working in a skilled labor field was significantly and negatively related to arrest for both Hispanics and Whites, whereas it had no relationship with arrest rate for Blacks. Future research should investigate why there is such variability among racial and ethnic groups. What other factors in an individual's life would make school variables such significant predictors of arrest for Blacks, but not educational attainment level?

In evaluating the relationship between educational attainment and arrest, the adult variables oftentimes had stronger relationships with offending than did the childhood variables. Admittedly, this difference may be because the dependent variable was measured during Waves 11-14, and the adulthood variables are more proximal to when arrest was measured. To test whether this was true, a second arrest frequency variable was created, which represented the total number of arrests during Waves 9-12[10]. Comparing the results of the regression tables in the childhood models, the effect of dropping out on arrest strengthens, and now has a significant relationship with arrest for all groups. The effect stopping out has on arrest remains unchanged in social control models. However, stopping out is now significantly related to arrest for females, Whites and the Forgotten Half group overall. Measuring arrest during Waves 9-12 also influences a few theoretical variables. Whether the individual lives with both biological parents is now significant across all groups. A difference worth noting is that the school identity variables no longer have a relationship to arrest for Black individuals. However, school social control variables remain significant even though dropping out is now related to arrest for Blacks. Measuring arrest closer to childhood and educational attainment variables therefore shows that educational attainment has a stronger effect on nearer-term arrest rates, and likely has a weaker direct effect on later arrest rates because it also operates indirectly.

A consistent finding across the models is that once theoretical constructs were added to the model, stopping out failed to remain significantly related to arrest. Dropping out, on the other hand, remained significant in both childhood and adulthood models.

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[10] Results are available from the author upon request.

There were other social control variables that also significantly affect arrest rates; however, they were not strong enough to reduce the effect of dropping out to insignificance. This implies that the relationship between dropping out and arrest is so strong that other theoretical constructs, even if they are also significantly related, cannot render it insignificant.

Stopping out, on the other hand, does not seem as damaging an educational state. Perhaps once opportunities to strengthen bonds or solidify a future identity are present, whether an individual stopped out does not matter. It is also possible that the effect of stopping out does not have a significant impact on future arrest rates because many stopouts ultimately earn a GED or high school diploma, so act of earning a credential outweighs the earlier actions of leaving. Future research should turn its attention towards determining what factors make arrest rates after stopping out less likely. Studies could compare social bond and identity strength among high school graduates and stopouts to determine whether these theoretical variables have stronger effects for high school graduates' arrest rates than it did for stopouts' arrest rates.

A couple of policy recommendations also emerge from this research. The first is to create programs that focus on skills that will encourage full-time jobs, and in more skilled professions. The findings from this dissertation show that full-time employment and working in skilled professions, in addition to educational attainment status, are important factors in lowering future offending rates. Improving the employability and proficiency of the individual seeking a job could have an impact on individual's earnings, especially minorities' earnings (Holzer, 1996). Employers often cite a desire for academic skills in prospective employees (Halperin, 1998; Rosenbaum & Binder, 1997).

However, this desire could be because more education serves as a signal to prospective employers that this individual possesses the intrinsic qualities such as dedication and perseverance that will make him or her an industrious worker (Bushway & Apel, 2012; Page & Davis, 2010). And these noncognitive skills may be the reason for both educational attainment and desirable employment outcomes (see Heckman & Rubinstein, 2001). Even if an individual had not received his or her diploma or GED, but was engaged in a school-to-work program or coursework after leaving school, these accomplishments and initiative could serve as indicators of promising work performance to employers, thus making stable and better long-term employment more likely and arrest less likely.

The second policy recommendation is to focus on programs that prevent dropping out. Dropping out is the recommended educational attainment level target, because regression results showed that once theoretical constructs were added to the models, stopping out failed to predict future arrest rates. It was only the effect of dropping out that continued to significantly increase future arrest rates. Both social control and identity theories argue that increasing amount of education received can lead to lower offending rates. Increasing educational attainment levels strengthens an individual's social bonds, thereby reducing future arrest rates. Dropout prevention for those with weak identities would also provide benefits by providing these individuals with opportunities to strengthen their identity, such as through a vocational school program. Early program interventions such as the Perry Preschool Project should continue to be encouraged (Farrington & Welsh, 2007; Wilson, 2000), but so should programs that focus on older students. School-to-work programs could provide

individuals who do not like school or do not perform well in school with either a positive

vision of a future worker self, and would also increase the amount of education he or she

received, thereby strengthening his or her social bonds (Neumark & Rothstein, 2005).

This study has several limitations worth noting. The first is concerned with the

difficulty determining the causal mechanism when evaluating the effect adult

employment had on future arrest rates. While the data show a strong relationship between

the two, it is not clear why this relationship exists. It could be due to increased social

bonds, a strong sense of identity, or even factors not related to either theory such as

routine activities theory (Cohen & Felson, 1979) that have not been explored yet.

Additional analysis with a dataset that captured the motivation, or lack thereof, for

employment would provide insight to this obscurity. For example, a dataset that asked

why an individual was seeking employment and had answers that measured stake in

conformity, or future worker identity would help uncover whether adult employment was

a stronger measure of social control or identity theory.

It was also difficult to determine the role selection plays in the relationship

between educational attainment status and arrest. For example, an individual that was

enrolled in a college prep program could have sought out this school track because he or

she saw the benefits it would provide later in life. Or it could have been a program that

the school determined for the individual. This difference has implications both for theory

and policy. If the individual's sense of self is the driving force behind these changes, then

more focus should be placed on determining what shapes that identity, what can help

solidify it, and what role education plays. Again, future studies should look to utilize datasets that include such measures.

A couple of limitations were concerned with how the variables were measured. This dissertation evaluated all variables by Wave. However, the Forgotten Half are defined as individuals in a certain age range, ages 16-24 specifically (Grant, 1988a). In capturing data by wave, measuring educational attainment at Wave 8 and the dependent variable during Waves 11-14, correct temporal ordering was preserved. However, educational attainment variables were defined as having obtained an educational level by Wave 8, which included individuals aged 20-25. In defining educational attainment by wave, rather than age, the age range used for this dissertation does not match the definition the Grant Foundation provided, and included individuals who were outside the original scope of the Forgotten Half.

The way the social control variables were also measured are also potential limitations. The assumptions made about the influence a mother's education level has on her child's arrest rates could be too tenuous. There could be too many factors that cloud the connection between parent's education and child's offending rates. Similarly, living with both biological parents may not be strongly related to social bond strength. Variables that measured the social control processes themselves, rather than structural background or individual difference variables that could influence social bonds (Sampson & Laub, 1993) would have been stronger measures of childhood social control variables. One such variable existed that captured biological mother's and father's parenting style[11];

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[11] Two such variables existed: mother's parenting style and father's parenting style. Each was a categorical variable with the following four parenting styles: authoritarian, uninvolved, permissive and authoritative. Four dummy variables were created for each parent's parenting style; authoritative was the reference category in each case.

however, when included in regression models, they were not significantly related to future arrest rates. Still, being able to include other variables that measured social bond strength either to parent or school would have been desirable. Finally, while Sampson and Laub argue that individual difference constructs can affect social control levels, a Mental Health Index score may not be the best measure of such temperament problems or conduct disorder behavior.

A final limitation concerns variable measurement and availability within the NLSY97. Arrest was chosen as the dependent variable for this study because it was one of the few offending variables measured during each wave. However, since many offenses do not result in arrest, the relationship between educational attainment and crime may be obscured. There were only 1,187 arrests over this timeframe period, committed by 553 individuals. Furthermore, the non-zero cases showed that the range for arrests was between one and 19, and the mean was only 2.15. Given the dark figure of crime, the number of crimes committed that go undetected by the criminal justice system (Mosher et al., 2002), choosing a different dependent variable such as offenses committed would likely have yielded more observations and increased variation. However, such measures did not exist in this dataset across the number of waves examined.

FUTURE RESEARCH

In addition to addressing the aforementioned limitations, the results of this dissertation prompt several lines of future research. First, alternative ways of measuring the relationship between educational attainment and offending should be studied. This dissertation divided the Forgotten Half into three educational attainment groups: those who left school and never returned, those who left school but did return, and those who

never left school and earned a high school diploma. Studies should be conducted where the educational attainment definitions are slightly different, this time focusing on the final credential earned. If the human capital argument and social control theory arguments are correct, then it is not factors that made an individual drop out or stop out significantly related to offending; it is the ultimate credential earned (Hirschi, 1969; Weisbrod, 1962). If internal factors such as drive, skill, and/or sense of identity are more important in predicting offending, then identity theory would receive more support and the credential, GED or diploma, would not be as important. These findings would also have implications for signaling theory, and help clarify whether it is the outcome (the 'signal') or the intrinsic quality that is the stronger predictor of arrest (Bushway & Apel, 2012).

A second recommendation is to have studies that better uncover the causal mechanisms. Such studies would contain additional measures of social control theory and identity theory, and possibly other theories that have not yet been considered, such as routine activity theory (Cohen & Felson, 1979), that were not captured here. Qualitative research would provide an opportunity for inductive, rather than deductive reasoning, specifically because of the rich narrative data that emerge from such studies. Mechanisms may emerge that have thus far not been tested yet.

In conclusion, this dissertation takes one of the first steps in uncovering the heterogeneity that exists within the Forgotten Half. It evaluates three distinct levels of educational attainment, thus providing a more complete picture of the relationship between education and crime. Initial findings show that different levels of educational attainment have different relationships with arrest. And the relationship can also be different depending on gender or racial/ethnic group. Examining the role social control

theory and identity theory play in explaining this relationship between educational

attainment and crime has displayed moderate support for both theories, but has also

highlighted the gaps that still exist in better understanding this relationship. The findings

from this dissertation highlight the importance of examining the variability in educational

attainment among the Forgotten Half. However, research in this area is sparse, and

hopefully the findings and conclusions discussed here will provide some guidance to

further explore this field.

Appendix A Variable Description

Variable	Wave Meas-ured	N	Mean (S.D)	Description	How Meas-ured	Theory
Dependent Variable						
Arrest Frequency	11-14	3,213	0.37 (1.20)	Total # times individual arrested between Waves 11-14	Self-report	None
Educational Attainment Variables						
Dropout	8	2,774	0.32 (0.47)	Individual dropped out of school and never returned by Wave 8 (1=dropout, 0=not dropout)	Self-report	None
Stopout	8	2,774	0.22 (0.42)	Individual dropped out of school but returned by Wave 8 (1=stopout, 0=not stopout)	Self-report	None
High School Graduate	8	2,774	0.46 (0.50)	Individual never dropped out and earned high school diploma by Wave 8 (1=HS graduate, 0=not HS graduate)	Self-report	None
Independent Variables						
Age	11	2,986	27.94 (1.43)	Individual's age	Parent	None
Gender	1	3,217	0.58 (0.49)	1=male, 0=female	Interviewer	None
Black	1	3,217	0.32 (0.47)	1=Black, 0=not Black	Parent	None
Hispanic	1	3,217	0.25 (0.43)	1=Hispanic, 0=not Hispanic	Parent	None
White	1	3,217	0.41 (0.49)	1=White, 0=not White	Parent	None
High School Grades	1-7	3,017	4.74 (1.50)	Maximum grades received in high school (1=mostly below D's, 8=mostly A's)	Self-report	Social Control

Positive School Attitude	1	3,214	4.60 (1.63)	Positive school attitude (0=lowest, 7=highest)	Self-report	Social Control
# Days Absent From School	1	3,070	6.58 (10.28)	Average number of days individual was absent in a school year	Self-report	Social Control
Mental Health Index	4	2,892	15.16 (2.71)	Youth's mental health index (5=most emotional problems, 20=fewest emotional problems)	Self-report	Social Control
Lives with Both Biological parents	1	3,217	0.35 (0.48)	Individual lives with both biological parents (1=yes)	Parent	Social Control
Highest Grade Completed by Mom	1	2,911	11.30 (2.56)	Mother's education level (# years of school)	Parent	Social Control
Vocational Program	1-7	3,129	0.22 (0.42)	Individual was in vocational technical program (1=yes)	Self-report	Identity
Covocational Program	1-7	3,129	0.17 (0.38)	Individual was in school/vocational combination program (1=yes)	Self-report	Identity
Other School Program	1-7	3,129	0.03 (0.18)	Individual was in other school program (1=yes)	Self-report	Identity
General School Program	1-7	3,129	0.90 (0.30)	Individual was in general school program (1=yes)	Self-report	Identity
Worked Intensely	1-7	2,906	0.91 (0.28)	Individual worked >20hrs per week during the school year any wave in Wave 1-7,	Self-report	Identity

				mean substitution for missing observations used (1=yes)		
Antisocial Peers	1	3,205	11.74 (5.16)	Antisocialness of peers (1=not antisocial, 25=very antisocial)	Self-report	None
Prosocial Peers	1	3,206	8.08 (2.46)	Prosocialness of peers (1=not very prosocial, 15=very prosocial)	Self-report	None
# Fights	1	3,170	0.67 (2.14)	# times individual ever got into a fight at school	Self-report	None
# Items Stolen	1	3,217	0.52 (1.37)	# of items an individual had something stolen while at school	Self-report	None
Cumulative Offending Index	1-7	3,217	3.62 (4.40)	Cumulative variety index for stealing item <$50, stealing item >$50, destroyed property, committed other property crimes, attacked/assaulted another individual, sold illegal drugs for all seven waves	Self-report	None
Ever Carry a Gun	1-7	3,217	0.30 (0.46)	Individual carried a gun (1=yes)	Self-report	None
Adulthood Variables						
Works Full-time	9-10	3,194	0.57 (0.50)	Individual worked full-time in Wave 9 or 10 (1=yes)	Self-report	Identity, Social Control
Unskilled Profession	9-10	3,217	0.55 (0.50)	Individual works in an unskilled profession (1=yes)	Self-report	Identity, Social Control
Married	10	2,907	0.23 (0.42)	Individual is married (1=yes)	Self-report	Identity, Social Control

| # Children | 10 | 2,906 | 0.77 (1.05) | Number of biological children living in household | Self-report | Identity, Social Control |

Appendix B Correlation Matrix of All Variables

	Arrest Frequency	Dropout	Stopout	High School Graduate	Age	Gender	Black	Hispanic	White	Mental Health Index	Lives With Both Biological Parents	Highest Grade Completed by Mom	High School Grades	Positive School Attitude
Arrest Frequency	1.00													
Dropout	0.09	1.00												
Stopout	0.01	-0.34	1.00											
High School Graduate	-0.09	-0.63	-0.52	1.00										
Age	-0.06	-0.06	-0.00	0.05	1.00									
Gender	0.12	-0.01	0.02	-0.01	-0.01	1.00								
Black	-0.01	0.06	0.00	-0.06	0.00	-0.03	1.00							
Hispanic	-0.00	0.06	-0.03	-0.02	0.02	-0.02	-0.38	1.00						
White	0.01	-0.10	0.01	0.08	-0.01	0.05	-0.58	-0.48	1.00					
Mental Health Index	-0.04	-0.07	-0.01	0.07	0.03	0.20	0.02	-0.02	0.00	1.00				
Lives With Both Biological Parents	-0.07	-0.12	-0.07	0.16	-0.03	0.08	-0.21	0.12	0.09	0.02	1.00			
Highest Grade Completed by Mom	0.02	-0.17	0.04	0.12	0.01	0.06	0.07	-0.41	0.28	0.05	-0.06	1.00		
High School Grades	-0.05	-0.25	-0.12	0.33	0.02	-0.16	-0.06	0.02	0.04	0.01	0.04	0.02	1.00	
Positive School Attitude	-0.01	-0.08	-0.02	0.09	-0.11	0.10	-0.11	0.10	0.01	0.10	0.07	-0.03	0.07	1.00
# Days Absent from	0.02	0.14	0.05	-0.16	0.14	-0.09	-0.05	0.03	0.03	-0.06	-0.07	-0.03	-0.09	-0.15

School College Prep Program	-0.04	-0.15	-0.06	0.18	-0.07	-0.04	-0.01	0.02	-0.01	-0.01	0.04	0.06	0.12	0.07
Vocational School Program	-0.03	-0.06	-0.02	0.08	-0.00	0.04	0.15	-0.13	-0.02	-0.05	0.00	0.03	0.04	0.02
Covocational School Program	0.01	-0.07	-0.07	0.12	-0.03	0.08	0.02	-0.09	0.04	-0.01	0.05	0.04	0.07	0.03
Other School Program	0.05	-0.01	0.04	-0.03	-0.03	-0.04	-0.04	-0.02	0.03	-0.06	-0.03	0.02	0.06	-0.02
Worked Intensely	0.03	0.03	0.03	-0.05	0.04	0.05	-0.05	0.01	0.06	0.02	0.03	0.04	-0.03	-0.01
% Peer Antisocial	0.05	0.06	0.05	-0.10	0.42	-0.13	0.05	-0.02	-0.01	-0.10	-0.09	0.04	-0.07	-0.37
% Peer Prosocial	-0.04	-0.02	-0.02	0.03	-0.19	-0.03	0.09	-0.03	-0.06	-0.01	0.07	-0.01	0.07	0.11
# Fights While in School	0.09	0.11	0.03	-0.13	-0.02	0.08	0.07	-0.00	-0.06	-0.05	-0.06	-0.02	-0.06	-0.15
# Items Stolen While in School	0.06	0.03	0.03	-0.05	-0.03	0.04	0.03	-0.05	0.01	-0.06	-0.03	0.03	-0.04	-0.16
Ever Carry a Gun	0.09	0.01	0.04	-0.04	0.03	0.33	-0.06	-0.03	0.08	-0.00	0.01	0.06	-0.06	-0.08
Works Full-time	-0.08	-0.17	-0.02	0.18	0.07	0.17	-0.16	0.07	0.08	0.13	0.11	0.02	0.05	0.07
Unskilled Profession	0.08	0.06	0.04	-0.09	-0.06	0.22	-0.01	-0.05	0.05	0.05	0.01	0.01	-0.11	0.01
Married	-0.02	-0.05	-0.02	0.06	0.09	-0.08	-0.21	0.09	0.13	-0.00	0.11	0.08	0.07	0.03
# Children	-0.06	0.11	0.01	-0.11	0.10	-0.42	0.06	0.05	-0.09	-0.08	-0.04	-0.13	0.04	-0.05

	# Days Absent from School	College Prep Program	Vocational School Program	Covocational School Program	Other School Program	Worked Intensely	Antisocial Peers	Prosocial Peers	# Fights at School	# Times Something Stolen at School	Ever Carry a Gun	Works Full-time	Unskilled Profession	Married	# Children
# Days Absent from School	1.00														
College Prep Program	-0.04	1.00													
Vocational School Program	-0.04	-0.04	1.00												
Covocational School Program	-0.08	-0.03	0.15	1.00											
Other School Program	-0.01	-0.06	-0.03	-0.02	1.00										
Worked Intensely	0.03	0.01	0.01	-0.01	-0.08	1.00									
Antisocial Peers	0.22	-0.06	-0.02	-0.06	0.01	0.06	1.00								
Prosocial Peers	-0.10	0.04	0.03	0.02	-0.02	-0.00	-0.13	1.00							
# Fights at School	0.09	-0.06	0.01	-0.00	0.04	0.01	0.08	-0.05	1.00						
# Times Something Stolen at School	0.05	-0.02	0.05	0.01	0.01	-0.01	0.09	0.01	0.11	1.00					
Ever Carry a Gun	0.03	-0.04	0.03	0.04	0.01	0.04	0.10	-0.05	0.11	0.07	1.00				
Works Full-time	-0.06	0.08	-0.03	0.04	-0.07	0.04	-0.05	0.02	-0.07	-0.01	0.02	1.00			
Unskilled Profession	-0.00	-0.05	-0.02	0.01	0.03	0.02	-0.06	0.01	0.02	0.03	0.07	0.08	1.00		
Married	0.04	0.04	-0.04	-0.04	-0.02	0.01	0.02	-0.04	-0.04	-0.03	0.01	0.06	-0.03	1.00	
# Children	0.08	-0.07	-0.02	-0.07	-0.00	-0.03	0.10	0.00	0.00	-0.01	-0.14	-0.14	-0.08	0.25	1.00

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