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Abstract

There is a large divide in the education, labor market, and personal security outcomes of black and white young males in the United States. This paper develops and estimates a dynamic model of black young males' joint decisions about schooling, labor force participation, and personal security. The formulation of the model is inspired by Elijah Anderson's ethnographic research regarding the incentives black young males face to ensure their personal security in environments where it is not provided by state institutions. I operationalize Anderson's notion of the code of the street by defining the set of skills and knowledge useful for providing personal security to be a distinct type of human capital, street capital, that agents may accumulate in my model. The model is estimated using longitudinal data from the NLSY97, which includes unusually rich information on participation in street behaviors. I use the model to quantify the influence of the code of the street on black males' schooling and labor market choices, and I examine potential policies to influence such choices. In particular, the estimated model is used to simulate a world in which children grow up in safe neighborhoods, as well as a world in which agents are given an unforeseen opportunity to freely dispose of their stocks of street capital. Large effects of the code of the street indicate that interpersonal violence is an empirically important factor influencing the education and labor market outcomes of black young men.

Degree Type

Dissertation

Degree Name

Doctor of Philosophy (PhD)

Graduate Group

Economics

First Advisor

Kenneth I. Wolpin

Keywords

Human Capital, Code of the Street, Street Capital, Neighborhood Effects

Subject Categories

Labor Economics | Public Economics | Sociology of Culture

HUMAN CAPITAL IN THE INNER CITY

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A DISSERTATION

in

Economics

Presented to the Faculties of the University of Pennsylvania in

Partial Fulfillment of the Requirements for the

Degree of Doctor of Philosophy

2010

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To the memory of my father,

Charalambos D. Aliprantis

Acknowledgements

I am particularly grateful to Ken Wolpin, Petra Todd, and Elijah Anderson for their encouragement and patience. Each has devoted a great deal of their time and energy to advising my dissertation, and each has provided me with an example of what it means to be truly dedicated to one's research. I also thank Hanming Fang, Becka Maynard, Janice Madden, Flávio Cunha, Charlie Branas, Rhonda Sharpe, Jeffrey Kling, Aureo de Paula, Michael Keane, Angela Duckworth, Michela Tincani, Andrew Clausen, Daniel Zeno, and Ellie Harvill for helpful comments, as well as seminar participants at the Penn Empirical Micro Reading Group, Fall 2008 APPAM conference, Penn Empirical Micro Club, Penn Urban Studies Colloquium, Purdue, Carnegie Mellon, Abt Associates, Kansas State, the Federal Reserve Bank of Cleveland, UMass Boston, Northeastern, and the University of Wisconsin Milwaukee Africology Department. The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305C050041-05 to the University of Pennsylvania. The opinions expressed are those of the author and do not represent views of the U.S. Department of Education.

ABSTRACT

HUMAN CAPITAL IN THE INNER CITY

Dionissi Aliprantis

Kenneth I. Wolpin

There is a large divide in the education, labor market, and personal security outcomes of black and white young males in the United States. This paper develops and estimates a dynamic model of black young males' joint decisions about schooling, labor force participation, and personal security. The formulation of the model is inspired by Elijah Anderson's ethnographic research regarding the incentives black young males face to ensure their personal security in environments where it is not provided by state institutions. I operationalize Anderson's notion of the code of the street by defining the set of skills and knowledge useful for providing personal security to be a distinct type of human capital, street capital, that agents may accumulate in my model. The model is estimated using longitudinal data from the NLSY97, which includes unusually rich information on participation in street behaviors. I use the model to quantify the influence of the code of the street on black males' schooling and labor market choices, and I examine potential policies to influence such choices. In particular, the estimated model is used to simulate a world in which children grow up in safe neighborhoods, as well as a world in which agents are given an unforeseen opportunity to freely dispose of their stocks of street capital. Under both simulations there is a dramatic rise in the share of African American males who graduate from high school and participate in the labor market. Counterfactual experiments are also performed to test the effects of wage and education subsidies. The large effects of the code of the street indicate that interpersonal violence is an empirically important factor influencing the education and labor market outcomes of black young men.

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Chapter 1

Introduction

Over forty years have passed since the Civil Rights Act, and yet there remains a large racial divide in the education and labor market outcomes of young men in the United States. 37% of black males in the National Longitudinal Survey of Youth 1997 (NLSY97) do not earn a high school diploma or better by age 21, in comparison with only 20% of white males. Black males are much less likely to work than white males, and overall they work far fewer hours.¹ As shown in Figure 1, the hours worked by black high school dropouts are especially low. Considering such outcomes together, Table 1 shows that after the age of 15 the percentage of black males who are neither in school nor in the labor force tends to be at least double that of white males.

Racial disparities also persist with respect to exposure to violence and interaction with the criminal justice system. Table 2 presents evidence that black males in the NLSY97 are much more likely to have seen someone shot at than white males, also tend to hear more gunshots in their neighborhoods, and are less likely to report feeling safe at school. The homicide death rate of black males between 15-34 is approximately 8 times that of white males (NCHS (2009)). Figure 2 shows that black males are much

¹For example, 21% of black males in the NLSY97 are not working at age 23, in comparison with 6% of white males. Moreover, the median 23 year old black male works 24 hours per week, compared with 38 hours per week for whites.

more likely than their white counterparts to have been suspended from school, and Pettit and Western (2004) estimate that for black (white) males aged 30-34 in 1999, nearly 59% (11%) of high school dropouts had spent time in prison.

A large literature in economics aims to understand the reasons for these disparities. Most of this literature focuses on education and labor market outcomes without considering non-market behavior. Key findings from this literature are that early skill differences are able to explain a large share of subsequent educational attainment and earnings gaps (Neal and Johnson (1996)), and that school quality has important implications for education and labor market outcomes (Card and Krueger (1992)).²

A smaller and mainly theoretical literature in economics abstracts from related labor market incentives and uses ideas from sociology to help formulate models of how non-market factors influence choices. One example is Silverman (2004), which develops a game theoretic framework in which there is a pay-off to investing in a violent reputation. His model is inspired by Elijah Anderson's ethnographic research on the "code of the street," an implicit code of conduct that has emerged in many poor African American neighborhoods due to the absence of institutions providing personal security. Alternatively, Akerlof and Kranton (2002) and Austen-Smith and Fryer (2005) develop peer-influence models where utility from choices depends directly on peer group behavior. Austen-Smith and Fryer (2005) models a phenomenon described in the ethnography of Fordham and Ogbu (1986), where working hard in school is considered "acting white," and thus African American children may be ostracized from their peer group for educational attainment. A key feature of these models is the possibility of equilibria characterized by adverse outcomes, such as low educational attainment or high levels of violent behavior.

²Additional important work in this literature includes Keane and Wolpin (2000), Cameron and Heckman (2001), Carneiro et al. (2005), Bertrand and Mullainathan (2004), Darity and Mason (1998), Bowlus and Eckstein (2002), Eckstein and Wolpin (1999a), Keane and Wolpin (1997), Hahn et al. (1999), Rivkin et al. (2005), Hanushek and Rivkin (2006), Donohue and Heckman (1991), Arcidiacono (2005), and Urzúa (2008).

Despite their plausibility, it has proven difficult to assess the empirical relevance of these newer theories, in part because they relate to non-pecuniary rewards and behaviors that are not usually directly observed. In particular, it has proven difficult to understand how non-pecuniary rewards vary geographically or socially, as well as their relationship with more standard pecuniary factors. For example, the empirical evidence is unclear regarding the existence of “acting white,” let alone the magnitude of its effects (Fryer and Torelli (2005), Cook and Ludwig (1997), Ainsworth-Darnell and Downey (1998)). In addition, empirical results from the recent Moving To Opportunity (MTO) housing mobility experiment, such as negative effects of mobility on young males (Kling et al. (2007)) and no effects on achievement tests (Sanbonmatsu et al. (2006)), only seem to raise further questions about many neighborhood effects as first postulated by Wilson (1987).³ These difficulties point to the importance of considering pecuniary and non-pecuniary factors together when modeling individuals’ joint decision-making about education, work, and violent behavior.

This paper develops and estimates a dynamic discrete choice model of young black males’ decisions regarding schooling, labor market participation, and street behavior that incorporates both pecuniary and non-pecuniary rewards. In specifying the model, I draw on Elijah Anderson’s ethnographic evidence that many young black males face incentives to engage in violent behavior. According to Anderson (1999), weak institutions and labor market conditions have left a void in setting and maintaining the social order within poor African American neighborhoods, allowing a “street” element to fill this void with its own code of conduct. This code of conduct, known as the code of the street, encourages individuals to use violence to further their own interests. Anderson has observed that those who become very invested in this code of conduct tend to become alienated from mainstream institutions, such as

³The Moving To Opportunity (MTO) experiment randomly allocated housing vouchers to families living in poor neighborhoods in five US cities.

the formal labor market.⁴

To empirically operationalize Anderson’s concept of the code of the street and its influences on the choices of young black males, I introduce into my model a distinct type of human capital defined as street capital. In each period, agents decide whether to attend school, work, and engage in street behaviors, and accumulate both regular human capital and street capital through these decisions. According to the ethnographic evidence, particular education and labor market choices are indications of alienation from mainstream institutions, so the model is specified with street capital changing the non-pecuniary rewards from these choices.

The model is estimated using unique longitudinal data from the National Longitudinal Survey of Youth 1997 (NLSY97) that include variables measuring street behavior. Measures of violent and non-violent street behaviors are created using self-reported data in the NLSY97 on whether respondents have attacked someone, carried a gun, belonged to a gang, been suspended from school, sold drugs, stolen anything, committed a property crime, or been arrested. A Simulated Maximum Likelihood (SML) algorithm is used to estimate the model on the sample of black males in the NLSY97.

Several counterfactual policy experiments are used to quantify the influence of the code of the street on the education and labor market outcomes of black young males. First, an experiment is performed to replicate aspects of the Moving To Opportunity (MTO) experiment. By diminishing the immediate return to street behavior, this counterfactual mimics the incentives children face while growing up in neighborhoods with little influence of the code of the street. Under this counterfactual scenario, about 20% more black young men after the age of 20 choose to work. In addition, about 7% more black young men graduate from high school, and predicted incarceration rates decrease by 1% for nearly all ages. In order to understand the importance

⁴Here alienated means at best uninterested in, and at worst directly opposed to.

of street behavior between the ages of 12 and 16, an additional counterfactual experiment is performed in which agents are given the choice at age 16, without prior knowledge, to either keep their current stock of street capital or to set them to zero. In this scenario about 7% more black males choose either to work or to attend school, and an additional 12% choose to graduate from high school. Finally, experiments are performed to assess the impact of a \$2,000 wage subsidy or \$2,000 conditional cash transfer for attending high school. Such a wage subsidy increases the percentage of black males working after the age of 18 by about 10%, and the conditional cash transfer causes an additional 10% of black males to graduate from high school. However, the wage subsidy also induces 5% more of black males to drop out of high school, and these policies have little impact on street behavior or imprisonment. Together, these results indicate the code of the street is an empirically important phenomenon when considering the outcomes of black young men.

The dissertation is organized as follows: Chapter 2 discusses a wide literature related to the outcomes of black young males. Chapter 3 presents a structural dynamic discrete choice model of human capital accumulation that incorporates key features of this reviewed literature. The sample from the National Longitudinal Survey of Youth 1997 (NLSY97) data set and the algorithm used to estimate the model are described in Chapter 4. Chapter 5 presents estimation results, and Chapter 6 discusses counterfactual experiments and their policy implications. Chapter 7 concludes.

Chapter 2

The Code of the Street

According to the qualitative evidence presented in Anderson (1999), weak institutions and labor market conditions have left a void in setting and maintaining the social order within poor African American neighborhoods, empowering a “street” element to fill this void with its own code of conduct. This code of conduct, known as the code of the street, encourages individuals to use violence in order to further their own interests. Although most people living in poor inner city neighborhoods adhere to a “decent” set of social norms which abhors violence (Anderson (1999), p 36), they must adjust their behavior to deal with the “street” social types who have a proclivity towards violence and “few moral compunctions against engaging in ‘wrongdoing’ and ‘mistreating’ others” (Anderson (1990), p 68).¹ This creates neighborhoods in which, as characterized by equilibria in the overlapping generations stage game in Silverman (2004), small proportions of street types are able to sustain high levels of violence.

Just as Austen-Smith and Fryer (2005) point out for the phenomenon of “acting white,” it is important to note that this type of security arrangement is not unique to poor African American neighborhoods.² Nevertheless, the manifestation of this

¹“Street” and “decent” are the labels used by inner city residents themselves; for discussions of these labels see page 35 of Anderson (1999) and Anderson (2002).

²It may in fact be viewed as a personalized version of realpolitik as defined in Kissinger (1995).

security arrangement in inner city neighborhoods has been heavily influenced by the alienation many blacks feel from mainstream institutions. Anderson (1999) argues that the code of the street is actually a cultural adaptation to a profound lack of faith in mainstream institutions, especially “in the police and the judicial system - and in others who would champion one’s personal security” (p 34). The racial discrimination generating this lack of faith has also helped to create a narrative of black racial identity that venerates alienation from mainstream institutions and values.³ The role of this narrative within the code of the street is captured in Anderson’s description of street and decent social norms: “The culture of decency is characterized by close extended families, low incomes but financial stability, deep religious values, a work ethic and desire to get ahead, the value of treating people right, and a strong disapproval of drug use, violence, and teenage pregnancy. The street represents hipness, status based on one’s appearance, and contempt for conventional values and behavior, which are easily discredited because of their association with whites. These behaviors can include doing well in school, being civil to others, and speaking Standard English” (p 287).

While historical distrust has helped to create and shape street culture, it is the social isolation discussed in Wilson (1987) that helps to sustain it. The weakness of social and state institutions in inner city neighborhoods allows the street group to

³While a complete overview of the forms racial discrimination has taken in the US is beyond the scope of this paper, a few examples help to illustrate their importance in generating alienation from mainstream institutions. For example, in addition to the well known Jim Crow laws, recent research has shown that spurious laws were widely used to re-enslave blacks between the Emancipation Proclamation and World War II (Blackmon (2008)). The white fear of black education that inspired antiliteracy laws during the Antebellum Period (Douglass (1982)) also led to violence against blacks who sought educational instruction during Reconstruction (Williams (2007)). Although many school policies of the 20th century were ostensibly race-neutral, their enactment within a highly segregated society created separate and unequal schools (Neckerman (2007)). The well-known Tuskegee Syphilis Study is just one of the many instances in which medical doctors have used African Americans for dangerous, involuntary, and nontherapeutic experimentation (Washington (2006)). Government sanctioned urban renewal projects have had disastrous consequences for African American communities (Fullilove (2001)). And most recently, the federal government’s failure in responding to Hurricane Katrina resulted in disproportionately negative consequences for the African American citizens of New Orleans.

dominate the public life of all children by violently punishing any children who do not join it (See Canada (1996).). This means that for any boy, “growing up in the ’hood means learning to some degree the code of the streets, the prescriptions and proscriptions of public behavior. He must be able to handle himself in public, and his parents, no matter how decent they are, may strongly encourage him to learn the rules” (Anderson (1999), p 114). One of the most important skills a youth may learn in order to navigate public spaces is the ability to determine which set of rules to apply to a given situation. Anderson (1999) labels this ability “to act, and certainly with which to gauge and understand the conduct of others” (p 105), as “code switching.”

The importance of code-switching is seen in the forces pushing youth towards the adoption of a street identity. For example, once a youth “has established himself or made a name for himself, he has some disincentive for code-switching, for now he has much to lose by letting the wrong people see him do so. . . . On the streets he has respect precisely because he has opposed that wider society” (Anderson (1999), p 103). In addition to the pull of the streets, the display of street postures for defensive purposes is often misunderstood within mainstream society. For example, due to their inability to distinguish decent children from street children, “teachers’ efforts to combat the street may cause them to lump the good students with the bad, generally viewing all who display street emblems as adversaries” (p 96). “The knowledge that the wider system in the person of cops, teachers, and store managers downtown is instantly ready to lump them with the street element takes a psychological toll on boys” (p 104). This creates “a powerful incentive for young people. . . , especially for those sitting on the cultural fence, to invest themselves in the so-called oppositional culture, which may be confused with their ‘black identity.’ Such a resolution allows these alienated students to campaign for respect on their own terms, in a world they control” (pp 96–97). While the adoption of a street identity may help youth attain

respect, given the street's contempt for conventional society, it negatively impacts education and formal labor market outcomes.

2.1 Relevant Theoretical Literature

2.1.1 Economics: Reputation and Identity

The theoretical literature related to Anderson (1999) focuses primarily on reputation and identity. Silverman (2004) develops a model based on Anderson's ethnography in order to resolve the challenges data on violent and non-pecuniary crimes present for the standard economic model of crime developed in Becker (1968). The key feature of Silverman (2004) is the incentive to behave violently, even for those who derive no satisfaction from violent behavior, due to the personal security afforded by a reputation for violence. The key result from the overlapping generations stage game is that there exist equilibria in which a low proportion of street, or violent, types may sustain high levels of violence due to reputation effects.

Theoretical work on identity, such as Akerlof and Kranton (2000), Akerlof and Kranton (2002), Austen-Smith and Fryer (2005), Fang and Loury (2005), Darity et al. (2006), Bénabou and Tirole (2007), and Battu et al. (2007), includes models in which the inclusion of identity yields quite different predictions than more "standard" models. Much of this work is motivated by the fictive kinship theory of Fordham and Ogbu (1986). The key feature of Akerlof and Kranton (2002) is that agents receive direct utility from behaving near an ideal type, and this competes with the pecuniary benefits to accumulating human capital. Austen-Smith and Fryer (2005) formulate a two-audience signalling model in which a signal that increases wages decreases peer group acceptance. The equilibria of their model partition the type space into two sets of agents: those who pool on low education and are accepted by the peer group,

and those who obtain higher levels of education and are rejected by the peer group. Finally, Fang and Loury (2005) contrasts with the previous models by developing a model in which agents do not directly derive utility from their identity, but rather only from their consumption. Their model also endogenizes identity as a social event that helps agents share risk, rather than simply an expression of an individual's values or preferences. Thus the model they develop allows for different social contexts to generate different equilibrium identity configurations, some of which may be inefficient while being fully rational on the part of individuals.

This theoretical literature highlights a distinguishing feature of Anderson's work, which is the importance of reputation relative to identity. According to Anderson's ethnography, for the vast majority of African American children in high poverty, socially isolated neighborhoods, the primary incentive for accepting a street identity or behaving according to street norms is not racial identity, but rather the direct threat of violence. That is to say, if such children are playing a two-audience signalling game along some dimensions of behavior, interpersonal violence plays a very important role in the interpretation of their signals.

2.1.2 Sociology: Hip Hop

Since Section 3 specifies a partial equilibrium model, an important concern is whether individual choices create general equilibrium effects by changing non-pecuniary rewards. However, "the power of mass media images to define social reality" (hooks (2006), p 212) diminishes this concern. Consider the important relationship between hip hop and African American identity: "We have arrived at a landmark moment in modern culture when a solid segment (if not a majority) of an entire generation of African-American youth understands itself as defined primarily by a musical, cultural form" (Rose (2008), p 9). The fact "popular culture has come to authoritatively fill

the void where other institutions . . . are beginning to disappear” (Dirks and Mueller (2007)) is important because of the recent evolution of commercial hip hop. In particular, commercial hip hop has grown to express fewer and fewer aspects of the African American experience, and has largely embraced the code of the street (Rose (2008)).⁴ Thus the current form and influence of commercial hip hop reduce concerns of general equilibrium effects from individual choices.

2.2 Relevant Empirical Evidence

2.2.1 Direct Evidence

Direct tests of the hypotheses generated by Anderson’s work are presented in a recent study by the National Institute of Justice (Stewart and Simons (2009)). Analyzing the results of surveys with over 800 African American youth in Georgia and Iowa, the study finds that those who internalize the code of the street are more prone to violence in the future. Furthermore, adolescents who had experienced racial discrimination were also more likely to engage in violent behavior, supporting Anderson’s claim that the street culture is a product of alienation.

2.2.2 Identity and Education

There is contradictory empirical evidence on whether African American children face different peer pressures related to education than white children. The litera-

⁴Here it is important to note that social forces such as economics or education have more influence on outcomes than entertainment (Perry (2008)), that hip hop as an art form encompasses many genres other than commercial hip hop (Perry (2004)), and that commercial hip hop has been heavily influenced by the consumer demand of whites (Hurt (2006)). In fact, the consumer demand of whites has received much attention. Critics point to its influence not only in music, but also in film (hooks (1999)) and television (Gray (2004)), when noting the ubiquitousness of images associating black identity with narrow aspects of the code of the street. Some critics have even argued that minstrel shows during the nineteenth and twentieth centuries played to white fears and stereotypes no more than do modern depictions of blacks in the mass media (Lee (2000)).

ture provides evidence supporting the fictive kinship theory of Fordham and Ogbu (1986) (Fryer and Jackson (2007), Patacchini and Zenou (2006)), as well as conflicting evidence (Ainsworth-Darnell and Downey (1998), Cook and Ludwig (1997), Karolyn Tyson and Castellino (2005)). Given this lack of consensus, it is worth briefly considering evidence from the NLSY97, as well as a few of the reasons other than fictive kinship that African Americans might be less engaged in school than white children.⁵ As discussed in Neckerman (2007) (pp 72-80), class relations have evolved differently in African American neighborhoods than in white neighborhoods. While upper class whites were removed from working class whites, all classes of blacks lived in close proximity to each other due to segregation. Thus the importance of education as a signal of class status may have created more animosity towards education in African American communities than in white communities. African American children may also be less engaged in school than their white counterparts if they do not feel secure. Table 2 presents evidence that black males in the NLSY97 born in 1982-84 are much more likely to have seen someone shot at than white males, also tend to hear more gunshots in their neighborhoods, and are less likely to report feeling safe at school. Table 2 also shows that although black and white males in the NLSY97 report being equally likely to have been threatened while at school, black males are more likely to have actually been in a fight at school. Low quality schools (Hanushek and Rivkin (2006)) and Eurocentric curricula (Asante (1991)) could also lead African American children to be less engaged in school than their white counterparts.

Returning to the literature on peer effects and academic engagement, it is important to examine measures of attitudes and expectations, and not simply measures of knowledge. For example, Ainsworth-Darnell and Downey (1998) use as one measure a variable from the National Education Longitudinal Study of 1988 (NELS88) on

⁵It is also worth noting here that fictive kinship is only one element of Ogbu's cultural-ecological model (Ogbu (2008)).

students' level of agreement with the statement: "Education is important for getting a job later on." Consider how one should interpret the results after asking Americans how much they agree with an analogous statement: "Diet and exercise are important for health later on." Agreement with this statement implies an understanding of the relationships between diet, exercise, and health; it does not imply that American society is conducive to a lifestyle that includes eating healthy and exercising regularly.

It is also important to consider that institutions determine how peer pressures affect outcomes. Suppose that black and white children face similar peer pressures. Even if black and white parents have similar educational expectations for their children (Table 3), similar peer pressures could still have different effects on the behavior of African American children due to differences in their parents' ability to support those expectations (Table 3, Harris and Robinson (2007)), the ability of state institutions to provide personal security (Anderson (1999)), or one's exposure to mainstream institutions and individuals (Wilson (1987)). Finally, consider evidence from the NLSY97 regarding the academic engagement of black children relative to white children. Table 4 presents data on time spent doing homework, reading for pleasure, and watching television that are consistent with Cook and Ludwig (1997) and Ainsworth-Darnell and Downey (1998). However, Table 4 and Figure 2 present data from the NLSY97 that contrast with those from the NELS88 reported in Cook and Ludwig (1997), indicating that black males have a different relationship with their schools than their white counterparts.⁶ Taken together, the empirical evidence on the differences in the academic experiences of black and white children does not does not lend itself to simple characterization.

⁶Further demonstrating this point, Table 5 shows that African American males are more likely than their white counterparts to be in a lower grade by the age of 12, despite the fact black males tend to start school earlier than white males (Aliprantis (2010)). Black males also graduate from high school at lower rates than white males for all initial grade levels at age 12 (Table 5).

2.2.3 Crime

Most empirical work on crime focuses on the standard pecuniary rewards for such behavior, with little attention paid to non-pecuniary incentives. For example, Imai and Krishna (2004) find that the possibility of adverse labor market outcomes has large effects on criminal behavior due to forward looking behavior. Lochner (2004) finds that the lower opportunity and incarceration costs for young, uneducated men to commit crime can explain patterns in criminal participation. One key feature of Lochner (2004) is that while agents may accumulate standard human capital, their ability for criminal behavior is fixed. In contrast, Imai et al. (2004) allows for criminal experience to increase agents' ability to commit crimes. They find that this effect on behavior is largest for the non-criminal types of their model. Related to both crime and peer effects, Bayer et al. (2009) look at data from correctional facilities in Florida, and find that the type of peer group to which one is exposed affects the probability of recidivism for the type of crime an individual has already committed. The model of crime most similar to the one specified in this paper is that of Mocan et al. (2005), which allows agents to simultaneously hold both standard and criminal capital. However, the model in Mocan et al. (2005) is not estimated. Durlauf and Nagin (2009) provide a review of the literature on the deterrent effects of imprisonment.

2.2.4 Neighborhood Effects

Of particular interest for understanding how effects of the code of the street vary by neighborhoods is Moving to Opportunity (MTO), an experiment in which households living in high-poverty US housing projects in five cities were allowed to enter a lottery for housing vouchers enabling them to move to lower poverty neighborhoods.⁷

⁷The MTO sites were Baltimore, Boston, Chicago, Los Angeles, and New York.

The MTO sample is mainly black, and, in contrast to researchers' expectations of universally positive effects, the findings from the experiment show that the effects of the program are mixed. In particular, there were negative effects on young males with respect to physical health, risky behavior, smoking and non-sports injuries (Kling et al. (2007)), as well as problem behaviors and property crime (Kling et al. (2005)).⁸

Although the offer to relocate families from high to low poverty neighborhoods has no ITT effect on reading and math test scores for children over all MTO sites (Sanbonmatsu et al. (2006)), a recent evaluation of the MTO data has shown that moving to a less distressed neighborhood in Chicago and Baltimore does in fact improve children's achievement test scores. Burdick-Will et al. (2009) note not only that Chicago and Baltimore had far higher homicide rates than the other cities in MTO in which there were no treatment effects, but also that the differences in local area violent crimes between control and either experimental or Section 8 groups were larger in Chicago and Baltimore than the other MTO cities. Based on these observations, Burdick-Will et al. (2009) hypothesize that exposure to violence is the most important neighborhood effect on children's achievement test scores.

Relating to both neighborhood effects and the code of the street, Sharkey (2006) uses longitudinal data from Chicago to create a measure of adolescents' perceptions of their ability to avoid violent confrontations and find ways to be safe in their neighborhoods. These perceptions, which the author defines as street efficacy, are found

⁸Although MTO provides valuable insights for understanding many important, policy-relevant neighborhood effects, there are important reasons not to interpret its results as tests of the hypotheses proposed in Wilson (1987). As noted in the literature reviewed here, only about a quarter of eligible families applied to enroll in MTO (Ludwig et al. (2008)), and no more than 60% of those receiving vouchers were compliers (Kling et al. (2007)). One indication that MTO volunteer families may be different than the general population is that the test scores of their children are considerably higher than one would expect given their demographic characteristics (Sanbonmatsu et al. (2006)). In addition to these concerns regarding the representative nature of the MTO sample, another issue when interpreting results from MTO is that short-run costs from moving could be considerable (Hanushek et al. (2004)). Finally, when considering the gender differences of MTO outcomes, Kling et al. (2007) discuss ethnographic evidence that both the timing and durability of neighborhood effects on young males are important.

to be related to the probability youth resort to violence or surround themselves with delinquent peers. However, an important finding from Sharkey (2006) is that street efficacy does not mediate the association between concentrated neighborhood disadvantage and individual violence.

2.2.5 Structural Models of Human Capital Accumulation

In addition to the literature directly related to the code of the street, there is also a more broadly relevant literature using structural dynamic discrete choice models to explain education and labor market outcomes.⁹ Eckstein and Wolpin (1999b) formulate a model of grade progression through high school in which youths make sequential decisions about school attendance and work. After estimating the model on a sample of white males, they conclude that changing the traits with which youths come to high school will have an empirically much larger impact on graduation rates than policies aimed only at work or attendance while in high school. Similarly, after estimating a dynamic model of educational and occupational choices over the life cycle on a sample of white males, Keane and Wolpin (1997) find that 90% of the variance in lifetime utility can be accounted for by unobserved endowment heterogeneity at age 16.

There is also evidence that unobserved age 16 skill endowments play a very important role in explaining racial differences in education and labor market outcomes. Keane and Wolpin (2000) find that larger portions of the racial gap in males' lifetime wages would be closed by equalizing age 16 skill endowments than by policies aimed at increasing graduation rates or even by a wage subsidy directly targeted towards blacks. On this topic it should be noted that Neal and Johnson (1996) arrive at a very similar conclusion using very different methodology. Estimating reduced-form

⁹See Aguirregabiria and Mira (2009) or Belzil (2007) for recent reviews.

wage equations, they find that age 16 AFQT scores explain nearly three-fourths of the racial wage gap for young men and all of the gap for young women. Finally, Cameron and Heckman (2001) find that racial differences in educational outcomes are best explained by the long-term influences of family income and family background. After also modeling schooling attainment as the outcome of sequential decisions made at each age and grade, they find that equating age 15 unobserved endowments actually makes blacks more likely than whites to complete high school or to enter college.

Chapter 3

A Model of Human Capital Accumulation

In modeling the environment faced by black young males, we follow Schultz (1961) and define human capital to be useful skills and knowledge that people acquire. The key insight from the Sociology literature discussed in Section 2 is that human capital is context specific. That is, the skills and knowledge useful to a person are not fixed, but depend on both the society and the place in that society in which a person lives.¹ It is with this insight in mind that we define street capital to be the skills and knowledge useful for operating under the code of the street.² Furthermore, the model assumes learning by doing, so that street capital is acquired in the process of participating in street behavior. While this type of human capital may be ignored by the formal labor market due to the fact it “is not always useful or valued in the wider society, . . . it is capital nonetheless. It is recognized and valued on the streets, and to lack it is to be vulnerable there” (Anderson (1999), p 105).

¹The factors influencing which skills and forms of knowledge tend to be adopted play an important role in development (Diamond (1999), Jones (2008)).

²Street capital is defined as a form of human capital since we consider it to be a type of skill or knowledge. Street capital is distinct from social capital in large part because it is something possessed by an individual rather than a group of individuals (Durlauf and Fafchamps (2004)).

We incorporate measures of this type of human capital into the framework developed in Keane and Wolpin (1997) in order to quantify how incentives to accumulate street capital affect the education and labor market outcomes of black young males. Consider a model in which agents may be engaged in one of four standard behaviors: work, education, neither, or prison. Agents choose between work, education, or neither, but are incarcerated with a probability that is a function of past choices. An agent participates in the education sector by attending school, which precludes participation in either the work or outside sectors. An agent participates in neither sector by not working and not attending school. Agents are unable to make any choices if they are in prison. In addition to choosing between the three standard choices, agents are also able to choose between participating in street or decent behaviors each period. An agent participates in violent street activities by attacking someone, carrying a gun, or belonging to a gang. An agent participates in non-violent street activities by breaking the rules of their school, selling drugs, stealing, committing a property crime, or coming into contact with the criminal justice system.³ And an agent chooses to participate in decent activities by abstaining from either type of street activity.

At each age $a \in \{\underline{a}, \dots, A\}$, an agent selects one of 12 mutually exclusive choices generated by the choices described above. Let $d_k(a) = 1$ indicate that choice k is selected at age a , so that $d_k(a) \in \{0, 1\}$ for $k \in \{1, \dots, 12\}$, with $\sum_{k=1}^{12} d_k(a) = 1$. The work alternatives are $d_1(a) = 1$ for work and decent, $d_2(a) = 1$ for work and violent street, $d_3(a) = 1$ for work and non-violent street, and $d_4(a) = 1$ for work and both types of street behavior. The education ($d_k(a) = 1; k = 5, 6, 7, 8$) and neither ($d_k(a) = 1; k = 9, 10, 11, 12$) alternatives are defined analogously. Let $s_v(a) = 1$ if an agent participates in violent street activities at age a , while $s_v(a) = 0$ if an agent does

³There are many ways one could define street behavior in line with Anderson (1999); these definitions are also motivated by the variables available in the data.

not participate in violent street activities at age a (ie, $s_v(a) = d_2(a) + d_4(a) + d_6(a) + d_8(a) + d_{10}(a) + d_{12}(a)$). Define $s_{nv}(a)$ analogously for non-violent street activities (ie, $s_{nv}(a) = d_3(a) + d_4(a) + d_7(a) + d_8(a) + d_{11}(a) + d_{12}(a)$), and let the vector be $s(a) \equiv (s_v(a), s_{nv}(a))$.

Denote an agent's cumulative street capital at the start of age a by $(x_v(a), x_{nv}(a))$, where:

$$x_v(a) = \begin{cases} x_v(\underline{a}) & \text{if } a = \underline{a}; \\ x_v(\underline{a}) + \sum_{t=\underline{a}}^{a-1} s_v(t) & \text{if } a > \underline{a}, \end{cases}$$

and

$$x_{nv}(a) = \begin{cases} x_{nv}(\underline{a}) & \text{if } a = \underline{a}; \\ x_{nv}(\underline{a}) + \sum_{t=\underline{a}}^{a-1} s_{nv}(t) & \text{if } a > \underline{a}. \end{cases}$$

Let $g(a)$ be the highest grade of schooling completed at age a , $x(a)$ be work experience at age a , $1\{\cdot\}$ the indicator function, and $c_1(a-1)$, $c_2(a-1)$, $c_3(a-1)$ be indicators for whether an agent chose, respectively, to work, attend school, or neither the previous period. We specify a standard wage function:

$$w(a) = r \exp \left[\alpha_0 + \alpha_1 g(a) + \alpha_2 x(a) - \alpha_3 x^2(a) + \epsilon^w(a) \right].$$

Returns in each sector of the economy are specified as follows:

$$\begin{aligned} R^w(a) &= w(a) - \alpha_4 c_3(a-1) + \rho 1\{g(a) \geq 12\} \\ R^e(a) &= \beta_0 - \beta_1 1\{g(a) \geq 12\} - \beta_2 1\{g(a) \geq 16\} - \beta_3 [c_1(a-1) + c_3(a-1)] \\ &\quad + \beta_4 x_v(a) + \beta_5 x_{nv}(a) + \rho 1\{g(a) \geq 12\} + \epsilon^e(a) \\ R^h(a) &= \gamma_0 + \gamma_1 x_v(a) + \gamma_2 x_{nv}(a) + \rho 1\{g(a) \geq 12\} + \epsilon^h(a). \end{aligned}$$

While R^w follows a standard specification, the specifications of R^e and R^h are motivated by theory and empirical evidence. This specification is in line with the proposition in Akerlof and Kranton (2002) that “For groups that are less universal [than gender groups], econometricians need to use ethnographic information that provides the signifiers” (p 1177). Theoretically, dropping out of school or choosing neither to attend school nor to work are considered to be indications of alienation from mainstream society. The specifications of R^e and R^h are then consistent with Anderson’s point that for many young black men, participating in street behavior can be seen as an investment “in their own alienation” (Anderson (2008a), p 17), so that “In time, for black youth, any fruits associated with the mainstream culture pale against the psychic rewards of the oppositional culture” (Anderson (2008a), p 18). Empirically, Figures 4 and 5 show that black males with higher levels of street capital have a higher probability of choosing neither to work nor to attend school. Finally, note that under this specification, α_4 may be interpreted as the cost of searching for work, and β_3 as a reentry cost for school. The parameter ρ is the return to graduating from high school, which individuals receive at all future ages, regardless of future choices, once they graduate from high school.

Returns to street and decent behaviors are as follows:

$$\begin{aligned}
R_v^s(a) &= \phi_0 + \phi_1 x_v(a) + \phi_2 s_v(a-1) \\
&\quad + \phi_3 s_v(a-1) s_{nv}(a-1) + \phi_4 s_v(a) s_{nv}(a) + \epsilon_v^s(a) \\
R_{nv}^s(a) &= \psi_0 + \psi_1 x_{nv}(a) + \psi_2 s_{nv}(a-1) \\
&\quad + \psi_3 s_v(a-1) s_{nv}(a-1) + \psi_4 s_v(a) s_{nv}(a) + \epsilon_{nv}^s(a) \\
R^d(a) &= 0.
\end{aligned}$$

The problem of identifying the relative importance of identity versus reputation in

generating street behavior is analogous to the problem of identifying whether attending additional years of school generates skills or simply serves as a signal (See Weiss (1995)).⁴ Preferences, as well as neighborhood effects due to reputation and identity concerns, are represented in the given specifications of $R_{nv}^s(a)$ and $R_v^s(a)$ by the constant terms ϕ_0 and ψ_0 . The unobserved heterogeneity in these terms cannot be attributed to any one of these factors alone, but rather represent the joint effect of innate preferences and situational influences.

Each agent's incarceration status is denoted by $p(a) \in \{0, 1\}$, and the probability that agents are incarcerated at each age, $\Pr[p(a) = 1]$, is determined by a latent index model. We assume there is a latent index $p^*(a)$ which is a function of past street behavior, past incarceration, whether an agent is over 18 years old, and a random shock $\epsilon_p(a)$:

$$p^*(a) = \lambda_0 + \lambda_1 s_v(a-1) + \lambda_2 s_{nv}(a-1) + \lambda_3 p(a-1) + \lambda_4 1\{a \geq 18\} + \epsilon_p(a). \quad (3.1)$$

Incarceration $p(a)$ follows the rule:

$$p(a) = \begin{cases} 1 & \text{if } p^*(a) \geq 0, \\ 0 & \text{if } p^*(a) < 0. \end{cases} \quad (3.2)$$

We assume that the $\epsilon_p(a)$ are distributed according to a contemporaneously and serially independent logistic distribution, so that Equations 3.1 and 3.2 are a logit model with the probability of being incarcerated:

$$\Pr[p(a) = 1] = \Lambda[\lambda_0 + \lambda_1 s_v(a-1) + \lambda_2 s_{nv}(a-1) + \lambda_3 p(a-1) + \lambda_4 1\{a \geq 18\}]. \quad (3.3)$$

⁴It could either be due to an increase in skills or due to a signal sent to employers, but higher educational attainment is associated with a higher wage. Similarly, it could be due to one's identity or one's need for a reputation, but higher levels of street capital are associated with an increase in the return to participating in more street behavior.

Each agent's utility at age a is:

$$U(a) = \begin{cases} \sum_{k=1}^4 R^w(a)d_k(a) + \sum_{k=5}^8 R^e(a)d_k(a) + \sum_{k=9}^{12} R^h(a)d_k(a) \\ \quad + R_v^s(a)s_v(a) + R_{nv}^s(a)s_{nv}(a) + \sum_{k=1}^{12} \theta_k d_k(a) & \text{if } p(a) = 0, \\ 0 & \text{if } p(a) = 1, \end{cases}$$

where θ_k for $k \in \{1, \dots, 12\}$ is an interaction term between standard and street choices (with $\theta_1 = \theta_5 = \theta_9 = 0$). With the exception of $\epsilon_p(a)$, we assume the other error terms in $\epsilon(a) \equiv (\epsilon^w(a), \epsilon^e(a), \epsilon^h(a), \epsilon_v^s(a), \epsilon_{nv}^s(a), \epsilon_p(a))$ are distributed according to contemporaneously and serially independent normal distributions. At each age agents observe the parameters of the model and their state vector:

$$\mathbb{S}(a) \equiv (g(a), x(a), x_v(a), x_{nv}(a), ed(a-1), s(a-1), p(a-1), \epsilon(a), \tau, a)$$

and choose $d(a) \equiv (d_1(a), \dots, d_{12}(a))$ to maximize the discounted sum of future returns. If we denote the optimal decision rule over time by $d^*(a) = d^*(\mathbb{S}(a))|_{\mathbb{S}}$, then the value function is:

$$V(\mathbb{S}(a)) = \mathbb{E} \left\{ \sum_{t=a}^A \delta^{t-a} U(a) | d^*(a), \mathbb{S}(a) \right\}.$$

Define each alternative specific value function as

$$V_k(\mathbb{S}(a)) = U(a)|_{d_k(a)=1} + \delta \mathbb{E} \left\{ V(\mathbb{S}(a+1)) | \mathbb{S}(a), d_k(a) = 1 \right\},$$

so we may write the value function as:

$$V(\mathbb{S}(a)) = \max_{d_k(a)} \left\{ V_k(\mathbb{S}(a)) \right\}.$$

The state vector is updated according to the following rule at the end of each age:

$$\begin{aligned}
g(a+1) &= g(a) + \max\{d_5(a), d_6(a), d_7(a), d_8(a)\} \\
x(a+1) &= x(a) + \max\{d_1(a), d_2(a), d_3(a), d_4(a)\} \\
x_v(a+1) &= x_v(a) + s_v(a) \\
x_{nv}(a+1) &= x_{nv}(a) + s_{nv}(a) \\
p(a+1) &= \begin{cases} 1 & \text{with probability } \Pr[p(a) = 1] \\ 0 & \text{with probability } 1 - \Pr[p(a) = 1]. \end{cases}
\end{aligned}$$

The terminal value function is

$$V(\mathbb{S}(A)) = \max_{d_k(A)} \left\{ U(A) + \delta V(\mathbb{S}(A+1) | \mathbb{S}(A), d_k(A) = 1) \right\},$$

where

$$\begin{aligned}
&V(\mathbb{S}(A+1) | \mathbb{S}(A), d_k(A) = 1) \\
&= \zeta_1 [g(A+1) - 8] + \zeta_2 x(A+1) + \zeta_3 x_v(A+1) + \zeta_4 x_{nv}(A+1) |_{\mathbb{S}(A), d_k(A)=1}.
\end{aligned}$$

To close the model, there are T heterogeneous types. Agents are heterogeneous in the model with respect to their endowments for their three standard choices (α_0, β_0 , and γ_0), their endowments for participating in street behavior (ϕ_0 and ψ_0), as well as their incarceration endowment (λ_0). Type probabilities are conditional on initial grade level ($\pi_{\tau|g(\underline{a})}$), assuming $g(\underline{a})$ to be exogenous, as well as $p(\underline{a}) = 0$ and $x(\underline{a}) = 0$. Also assume that $s_v(a-1)$ and $s_{nv}(a-1)$, and therefore $x_v(\underline{a})$ and $x_{nv}(\underline{a})$, follow independent Bernoulli distributions with probability of success dependent on an agent's type.

3.1 Estimation Method

The algorithm for estimating the model is the Simulated Maximum Likelihood (SML) algorithm introduced by Keane and Wolpin (2001). Let O^i be an observed outcome history, where there are $i = 1, \dots, I$ observed individuals. Specifying the initial conditions \tilde{S}^n , generate $n = 1, \dots, N$ simulated outcome histories \tilde{O}^n . Let $\tilde{O}^n = (\tilde{S}^n, \tilde{O}_{a=\underline{a}}^n, \dots, \tilde{O}_{a=A}^n)$, where the simulated outcome histories are wages and choices, $\tilde{O}_a^n = (w^n(a), d^n(a))$, and the initial conditions are

$$\tilde{S}^n = (g^n(\underline{a}), x^n(\underline{a}), x_v^n(\underline{a}), x_{nv}^n(\underline{a}), ed^n(\underline{a} - 1), s^n(\underline{a} - 1)).$$

Keane and Wolpin (2001) simulate the probability of the observed outcome history for person i , $P(O^i)$, by assuming that all observed outcomes are measured with error, so there is a positive probability that any observed outcome could be generated by any simulated outcome history. If $P(O^i|\tilde{O}^n)$ is the probability that observed outcome history O^i is generated by the simulated outcome history \tilde{O}^n , then $P(O^i|\tilde{O}^n)$ is the product of classification error rates for discrete outcomes and measurement error densities for wages.⁵ Thus we are able to construct the unbiased simulator:

$$\hat{P}_N(O^i) = \frac{1}{N} \sum_{n=1}^N P(O^i|\tilde{O}^n) \quad (3.4)$$

To handle the $k = 1, \dots, K$ heterogeneous types, where $\pi_{k|\tilde{S}^n}$ is the probability a person is type k given initial conditions \tilde{S}^n , we now simulate N/K outcome vectors

⁵The example given in Keane and Wolpin (2001) for illustration is as follows: Assume a single discrete outcome with error classification rates $P(1|1) = 0.9$, $P(1|0) = 0.1$, $P(0|1) = 0.1$, and $P(0|0) = 0.9$. If $T = 4$ and -9 indicates a missing observation, then $P(1010|1111) = (0.9)(0.1)(0.9)(0.1) = 0.0081$ and $P(-90-91|1011) = (0.9)(0.9) = 0.81$. Note that without measurement error O^i and \tilde{O}^n would be inconsistent (ie, $P(O^i|\tilde{O}^n) = 0$).

\tilde{O}_k^n for each type k . The unbiased simulator then becomes:

$$\hat{P}_N(O^i) = \sum_{k=1}^K \sum_{n=1}^{N/K} P(O^i | \tilde{O}_k^n) \frac{\pi_k \tilde{S}^n}{N/K}. \quad (3.5)$$

New outcome histories are drawn for each new trial parameter vector, which are then used to generate the simulated probabilities according to Equation 3.5. A simplex algorithm is used to maximize the resulting simulated likelihood function. Standard errors are obtained using the outer product of the gradient vectors. The numerical gradients are computed using a proportional step size of $h = 0.001$ for each parameter.

To specify the misclassification process, let $c_i(a) \in \{1, 2, 3\}$ be agent i 's choice with respect to Work ($c_i(a) = 1$), School ($c_i(a) = 2$), and Neither ($c_i(a) = 3$). Further, let $c_i^*(a)$ be the agent's true choice, and $c_i(a)$ be the agent's recorded choice. Defining $f[c(a) = 1] = \frac{1}{I} \sum_{i=1}^I 1\{c_i(a) = 1\}$, we follow Keane and Wolpin (2001) and specify the misclassification process to be as follows:

$$\begin{aligned} \prod_{0a}^{c=1} &= Pr(c_i(a) = 1 | c_i^*(a) = 1) = EC + (1 - EC)f[c(a) = 1] \\ \prod_{1a}^{c=1} &= Pr(c_i(a) = 1 | c_i^*(a) = 2) \\ &= Pr(c_i(a) = 1 | c_i^*(a) = 3) = \left(1 - \prod_{0a}^{c=1}\right) \frac{f[c(a) = 1]}{1 - f[c(a) = 1]} \end{aligned}$$

where EC is a parameter to be estimated, and $\prod^{c=2}$ and $\prod^{c=3}$ are defined analogously. Define similar misclassification processes for incarceration ($p(a) \in \{0, 1\}$) and street choices ($s_v(a) \in \{0, 1\}$ and $s_{nv}(a) \in \{0, 1\}$), with ESP , ESV , ESN , \prod^{s_v} , \prod^{s_i} , and \prod^p defined analogously.

The measurement error process for hourly wages is assumed to be multiplicative:

$$w(a) = w^*(a)\exp(\epsilon_w(a))$$

where

$$\epsilon_w(a) \sim N(0, \sigma_w^2).$$

The sample likelihood is then simply the product

$$\mathcal{L}(\theta|O^1, O^2, \dots, O^I) = \prod_{i=1}^I \hat{P}_N(O^i).$$

Once estimation is complete, we can assign a set of type probabilities to each individual in the sample. By Bayes' rule and Equation 3.5:

$$Pr(\tau = k|O^i) = \frac{Pr(O^i|\tau = k)Pr(\tau = k)}{Pr(O^i)} = \frac{\frac{K}{N} \sum_{n=1}^{N/K} P(O^i|\tilde{O}_k^n)\pi_{k|\tilde{S}^n}}{\frac{K}{N} \sum_{k=1}^K \sum_{n=1}^{N/K} P(O^i|\tilde{O}_k^n)\pi_{k|\tilde{S}^n}}. \quad (3.6)$$

Fifty draws are used for the numerical integration of the Emax function, $E\{V(\mathbb{S}(a+1)|\mathbb{S}(a), d_k(a) = 1)\}$, which is performed at each value of the state space $\mathbb{S}(a)$ between the ages of 12 and 30. When constructing $\hat{P}_N(O^i)$, 5,000 simulated outcome histories \tilde{O}_k^n are used for each type $\tau \in \{1, 2, 3, 4\}$, so that 20,000 outcome histories are simulated overall.

Chapter 4

Data

4.1 Sample

The National Longitudinal Survey of Youth 1997 (NLSY97) is a survey designed to be representative of people living in the United States in 1997 who were born between 1980 and 1984. In addition to the representative random sample of 6,748 respondents, there is a supplemental sample of 2,236 black and Hispanic respondents, for an overall total of 8,984 individuals. This analysis uses the 1,198 black males in the NLSY97.

4.2 Time Periods and Age

Each year starts on October 1st. On that day each agent wakes up, observes his state variable, and makes his choice for the year. The state variable is updated as described in Section 3 on the last day of the year, September 30th, and on October 1st the agent wakes up to a new state variable and makes his choice for the new year. According to this definition, for example, the 1997 year is from October 1st of 1997 until September 30th of 1998. Table 6 shows the age of black males in the NLSY97

at the date they are interviewed in each round, and Table 6 shows the age of black males in October of the year starting on October 1st, which is the age assigned to each agent for the year.

4.3 Work and Wages

The event history of the NLSY97 has weekly data on total hours worked in employee-type, self-employed, or freelance jobs. In order to align this data with the time periods defined above, we define the total hours worked in any year to be the total hours worked between the 40th week of the calendar year and the 39th week of the next calendar year.¹ An individual chooses to work if he does not attend school and works a total of at least 780 hours during the year. In addition to civilian work data, the event history also has weekly data on military employment. An individual is also considered to be working if he is employed by the military for at least 25 weeks of the year.

Weekly wages for self-employed and employee-type jobs are the sum over all such jobs worked of the product of hourly compensation and hours worked at each job.² This data is found in the event history of the NLSY97. Annual wages are simply the sum over weekly wages for the year defined above, which are deflated by the gross national product deflator, with 2000 as the base year.³ Military pay grade information is not used.

¹For example, total hours worked in 1997 is the total hours worked between the 40th week of 1997 and the 39th week of 1998.

²Up to three such jobs may be worked at any one time, and up to nine over the course of a year.

³Also included in annual wages are earnings from freelance jobs, which are distinguished from self-employment by age and compensation.

4.4 School Attendance

The event history in the NLSY97 has annual data on the grade individuals attended during a given academic year up to the 12th grade. The NLSY97 also has a created variable listing the highest grade completed by a respondent prior to the start of each academic school year. Using these data, an agent chooses to attend school if he reports both attending and completing a grade during an academic year. In addition, the event history also has monthly data on school enrollment status. An individual is also considered to be enrolled in school if he has attended college for six or more months during the year.

4.5 Neither Work Nor School

An agent chooses the outside sector if he chooses neither to attend school nor to work, and he is not incarcerated.

4.6 Street Behavior

As defined in Section 3, an agent participates in violent street activities by attacking someone, carrying a gun, or belonging to a gang. Each of these questions is self-reported in the NLSY97.⁴

An agent participates in non-violent street activities by breaking the rules of their school, selling drugs, stealing, committing a property crime, or breaking the law. Respondents self-report if they have helped to sell illegal drugs, if they have stolen more than \$50, as well as if they have committed any property crimes. While the data in the NLSY97 on suspensions and arrests are obviously imperfect measures

⁴See Thornberry and Krohn (2002) for evidence on the reliability of using self-reported survey data on street behavior.

of whether individuals have broken the law or the rules of their school, this issue is handled in our estimation algorithm through the *ESI* parameter to be estimated, as discussed in Section 3.1. Note that we ignore suspensions occurring after grade 12.

With the exception of suspensions and arrests, data on street behavior in the NLSY97 is collected on a different time frame than the work and schooling data in the event history. Respondents are asked in the first round if they have ever taken part in certain behavior, as well as if they have taken part in such behavior in the past 12 months. In each subsequent round respondents are asked if they have taken part in specified behavior since the date of the last interview. Since the interviews do not take place on a regular interval, this data will not be consistent with respect to the time periods defined in Section 4.2. Thus we are forced to make the following assumptions with respect to the timing of street behavior. If a respondent reports participating in some type of street behavior since the date of the last interview, it is assumed that the respondent has participated in this behavior in each month since the month following the last interview, including the month of this year's interview. If a respondent was not interviewed in the the most recent round, then their response is assumed for the previous 12 months as well. For each year in which we observe an agent's street choices we construct the ratio of months in which an agent participates in street behavior to the months during that year in which the agent's choice is observed. An individual participates in street behavior during the year defined in Section 4.2 if this ratio is at least $\frac{1}{2}$.

4.7 Incarceration

Respondents are asked in the NLSY97 if they have spent time in a correctional institution since the date of their last interview. If they respond positively, they are then asked the start and end month of each spell in prison. Using this monthly data,

we then define an individual to have been in prison $p(a) = 1$ at age a if they spent 6 or more months of the year in a correctional institution. The analogous probation data is not used in the construction of this variable. It should also be noted that data is missing for the 2003 (7th) round of the NLSY97 due to a design flaw (McClaskie (2009)).

4.8 Descriptive Statistics

Tables 7–22 show descriptive statistics of black males in the NLSY97 for the given variable definitions. Table 7 shows the choices between work, school, and neither by age. Note the high percentage of black males who are neither in school nor in the labor force after age 15. Also note that included in the neither category are those who are incarcerated. Table 8 shows the decisions of black males by age over all twelve of the mutually exclusive choices in the model. Note that street behavior is most likely to occur while children are attending school, with the majority of such behavior being non-violent. However, a large share of children in school do partake in violent street behavior, whether alone or together with non-violent street behavior. Also note there is a sizeable portion of young men who participate in violent street behavior while also choosing to work.

Tables 10 and 11 present the unconditional transition matrices between choices. Choices regarding standard human capital accumulation are much more persistent than choices regarding street capital accumulation. Nearly half of those choosing either violent or non-violent street behavior alone choose to partake in no street behavior the next period. In contrast, less than 20% of those who engage in both types of street behavior abstain from street behavior altogether in the next period.

Table 12 shows the frequency of each component of street behavior by age. Attacking someone is the most frequent source of violent street behavior, especially at

younger ages. However, the rate of attacks decreases over age. In contrast, the rate of carrying a gun stays relatively constant over age, so that by the early twenties this is the greatest source of violent street behavior. At early ages suspensions and property crimes are by far the greatest sources of non-violent street behavior. These behaviors decline with age, so that by the early twenties arrests and drug dealing are the greatest sources of non-violent street behavior. Table 22 shows the percentage of black males who had spent time in prison according to our definition.

Chapter 5

Estimation Results

5.1 Model Fit

Figures 6 – 22 show actual data from the NLSY97 together with data from 5,000 individuals simulated from the model using the estimated parameter values. Tables 7–14 present this data in tabular form. As displayed in Figures 10–13, the estimated model slightly over-predicts each type of street behavior, leading to an under-prediction of decent behavior. It may be seen from Figures 6–8 that the estimated model also slightly under-predicts the share of black males working, but otherwise fits data on standard human capital choices very well. The estimated model also does a good job of capturing the dropout rate of black males (Figure 9), but has some difficulty capturing changes in imprisonment over the life cycle (Table 22). Figures 14–21 display kernel density estimates of actual and predicted wages, and Table 14 displays moments from each distribution.

The estimated model is also able to match the persistence of choices in the data. The transition matrix presented in Table 10 shows that the estimated model captures the persistence and temporal patterns of standard choices. The transitions between street choices are more difficult for the model to fit: most match the data, but the

model does have trouble fitting the persistence in transitions between only non-violent and both types of street behavior (Table 11). The model is rejected by χ^2 goodness of fit tests for both of these transition matrices.

Tables 15–17 report parameter estimates along with outer product gradient (OPG) standard errors.

5.2 Unobserved Heterogeneity and Demographic Characteristics

Note that the parameter estimates reported in Tables 15 and 16 indicate the code of the street has heterogeneous effects over the population of all young black males. This is evident from a quick characterization of the types: type 1 individuals have large age 12 education and labor market endowments, and have endowments that discourage street behavior. The endowments of type 4 individuals are not as advantageous for education and labor market outcomes, but also do not favor engaging in street behavior. In contrast, type 2 and type 3 individuals have some interest in engaging in street behavior. Type 2 and type 3 individuals have endowments suited towards both types of street behaviors, with type 2 individuals more suited towards violent street behavior, and type 3 individuals more suited for non-violent street behavior. Note that type 2 and type 3 individuals make up a much greater share of the mixture for those who are enrolled in sixth grade or lower at age 12 compared with those who are enrolled in at least seventh grade by that time. Also note that since the NLSY97 does not contain detailed neighborhood variables for each round, individual preferences, as well as neighborhood and peer-group effects, are all incorporated into the heterogeneity by type contained in the constant terms ϕ_0 and ψ_0 .

Table 18 illustrates how these type-specific parameters characterize choices by re-

porting the results of 5,000 simulated outcome histories for each type. At age 21 type 1 individuals are either working or enrolled in school. Type 4 individuals at age 21 are nearly all working, with small shares either enrolled in school or not participating in schooling or the labor market. In contrast, at age 21 over half of type 2 and type 3 individuals are neither working nor enrolled in school. Essentially all type 1 individuals graduate from high school, with over 80% going on to receive a college degree. Type 4 individuals, who participate in the labor market at a much higher rate than type 2 or type 3 individuals, fair only marginally better in educational attainment than type 2 and type 3 individuals. And while type 1 and type 4 individuals abstain from street behavior, type 2 and type 3 individuals, respectively, tend to specialize in violent and non-violent street behavior.

Unfortunately, the estimated model does not aid in understanding whether the heterogeneity in estimated parameters over types are due to innate preferences or geographic and social influences. However, it is possible to examine how these types are related to demographic characteristics. For each individual in the sample the probability distribution of types conditional on their observed data is calculated using Bayes' rule as displayed in Equation 3.6. Table 19 shows the distribution of types in the sample, as well as the mean type probabilities for several subsamples. Importantly for the counterfactual experiment discussed in Section 6.1, we see that as the number of gunshots heard in one's neighborhood in a typical week goes up, the proportion of type 1 individuals decreases monotonically and the proportion of type 3 individuals increases monotonically. The distribution of type probabilities by other subgroups all conform with priors.

Chapter 6

Discussion

6.1 How Would Safe Schools and Neighborhoods Affect Outcomes?

One counterfactual policy experiment is performed to mimic changes in neighborhood environments: positive utility endowments for engaging in street behaviors (ϕ_0 and ψ_0) are reduced to 0. As discussed in Section 5.2, these terms incorporate individual preferences, as well as neighborhood and peer-group effects. Nevertheless, one interpretation of setting these parameters to 0 is that it replicates moving children from neighborhoods where the code of the street is very influential to neighborhoods in which children no longer have incentives to engage in street behaviors.

This counterfactual policy experiment makes sense if we consider the code of the street to be a specific type of neighborhood effect, and there is indeed evidence that interpersonal violence is an important neighborhood effect. In addition to Anderson's ethnographic evidence on the importance of interpersonal violence, evidence from the MTO experiment indicates that the fear of random violence (Kling et al. (2005)) and the need to preserve one's reputation (Kling et al. (2007)) have important effects on

outcomes. As well, a recent examination of the MTO data has shown that moving to a less distressed neighborhood in Chicago and Baltimore does in fact improve children's achievement test scores (Burdick-Will et al. (2009)).¹ Since this is not true of children in all MTO sites (Sanbonmatsu et al. (2006)), Burdick-Will et al. (2009) examine key differences between Chicago and Baltimore and the other MTO cities. The authors note not only that Chicago and Baltimore had far higher homicide rates than the other cities in MTO, but also that the differences in local area violent crime rates between control and treatment groups were larger in Chicago and Baltimore than in the other MTO cities. Based on these observations, Burdick-Will et al. (2009) hypothesize that exposure to violence is the most important neighborhood effect on children's achievement test scores.

In the counterfactual experiment in which the code of the street as a neighborhood effect is reduced, there are very large changes in the labor market outcomes of black young men, with substantial effects on education outcomes as well. These results are displayed in Figures 23–30 and Table 20. About 20% more black young men after the age of 20 choose to work. Although smaller, the effects on educational attainment are still considerable; about 7% more black young men graduate from high school. The results of this counterfactual experiment suggest that exposure to interpersonal violence has important effects on outcomes, aligning well with the evidence presented in Burdick-Will et al. (2009).

¹An important implication of these findings is that schools need not be the only channel through which achievement may be influenced (Dobbie and Fryer (2009)).

6.2 Can Those Heavily Invested in the Code of the Street Be (Re-)Incorporated into Mainstream Society?

There are also reasons to be interested in the importance of timing and durability for effects from the code of the street. Timing and durability may be important for understanding neighborhood effects (Sampson et al. (2008)), especially how they differ by gender (Kling et al. (2007)).² As well, previous research indicates that unobserved endowments at age 16 are extremely important in explaining later education and labor market outcomes (This work is discussed in greater detail in Section 2.2.5; see Keane and Wolpin (1997), Keane and Wolpin (2000), Cameron and Heckman (2001), and Neal and Johnson (1996).).

In order to quantify how important the street capital accumulated between ages 12 and 16 is for later outcomes, a counterfactual experiment is performed in which at age 16, without prior knowledge, agents are given the choice to either keep their current stock of street capital (x_v, x_{nv}) , or to set $x_v(17) = x_{nv}(17) = 0$. The outcomes of this counterfactual policy experiment are shown in Figures 31–38 and Table 21. Again, there are large effects on outcomes: After the age of 19, about 7% more of black males choose either to attend school or work, and 12% more of black males graduate from high school. The results of this counterfactual experiment indicate that even at older ages, interventions are still able to have positive effects on children’s later outcomes.

²Given that their causes are not well understood, one conjecture is that the timing of effects from the code of the street may help to explain gender differences in treatment effects from the MTO experiment (Kling et al. (2007)), as well as early childhood interventions (Anderson (2008b)) and job training programs (Abadie et al. (2002), LaLonde (1995)).

6.3 How Would Policies Such as a Wage Subsidy or Conditional Cash Transfer Affect Outcomes?

A final set of counterfactual policy experiments explores the results of two policy interventions. The first is a \$2,000 annual wage subsidy, which is similar to an increase in the minimum wage.³ The second intervention is a \$2,000 conditional cash transfer for each year of completed schooling while in high school. This second intervention is widespread in Latin America (Todd and Wolpin (2006), Handa and Davis (2006)), and is also currently being implemented in New York City (Miller et al. (2009)).

As seen in Figures 39–46 and Table 22, these interventions have only modest effects on street behavior. However, the wage subsidy does have large impacts on labor market outcomes; about 10% of black males are induced to work after the age of 18. In contrast, the conditional cash transfer has little impact on these choices. However, it is also true that the wage subsidy causes 5% more of black males to drop out of high school, whereas the conditional cash transfer causes an additional 10% of black males to graduate from high school. The results of these counterfactuals, which follow similar patterns as those performed in Keane and Wolpin (2000), indicate that the pecuniary incentives of such interventions have little impact on outcomes not specifically targeted.

³\$2,000 per year is the equivalent of a \$1.60 per hour wage increase for the median 23 year-old black male worker who works 24 hours per week.

Chapter 7

Conclusion

In order to study the outcomes of young black men in the US, this paper developed and estimated a dynamic model of black young males' joint decisions about schooling, labor force participation, and street behavior. In particular, the estimated model built on two distinct literatures within economics; one that focuses primarily on labor market incentives, and one that primarily focuses on the non-pecuniary returns to behavior. The specification of the model was guided in large part by Elijah Anderson's ethnographic evidence that many young black males face incentives to engage in violent behavior due to weak state institutions. To empirically operationalize Anderson's concept of the code of the street and its influences on the choices of young black males, the model included a distinct type of human capital defined as street capital. Since the ethnographic evidence indicates particular education and labor market choices are due to alienation from mainstream institutions, which increases as individuals become more invested in the code of the street, the model was specified with street capital changing the non-pecuniary rewards from choices.

After estimating the model on data from the National Longitudinal Survey of Youth 1997 (NLSY97), several counterfactual policy experiments indicate the effects of the code of the street are empirically large. First, an experiment was performed to

replicate aspects of the Moving To Opportunity (MTO) experiment. By diminishing the immediate return to street behavior, this counterfactual mimicked the incentives children face while growing up in neighborhoods with little influence of the code of the street. Under this counterfactual scenario, about 20% more black young men after the age of 20 chose to work. As well, about 7% more black young men graduated from high school, and there was also a decrease in incarceration rates. In order to understand the importance of street behavior between the ages of 12 and 16, an additional counterfactual experiment was performed in which agents were given the choice at age 16, without prior knowledge, to either keep their current stock of street capital or to set them to zero. In this scenario about 7% more black males chose either to work or to attend school, and an additional 12% chose to graduate from high school. Finally, experiments were performed to assess the impact of a \$2,000 wage subsidy or \$2,000 conditional cash transfer for attending high school. Such a wage subsidy increased the percentage of black males working after the age of 18 by about 10%, and the conditional cash transfer caused an additional 10% of black males to graduate from high school. However, the wage subsidy also induced 5% more of black males to drop out of high school, and these policies had little impact on street behavior or imprisonment. Together, these results indicate the code of the street is an empirically important phenomenon when considering the outcomes of black young men.

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Tables

Table 1: Percent of Males Choosing Neither to Attend School Nor to Work More Than 15 Hours per Week

Age	Percent		n	
	White	Black	White	Black
12	0.0	0.0	2,695	1,196
13	0.4	0.6	2,691	1,192
14	1.2	1.7	2,671	1,184
15	2.3	3.7	2,623	1,170
16	3.6	7.0	2,571	1,154
17	6.6	17.3	2,506	1,119
18	9.7	24.3	2,402	1,080
19	11.8	30.1	2,364	1,038
20	13.6	31.8	2,299	1,019
21	15.5	32.8	2,157	969
22	16.1	32.1	1,680	783
23	14.7	30.0	1,170	560
24	12.3	30.2	692	328
25	17.6	27.7	302	130

Table 2: NLSY97 Males' Neighborhood and School Characteristics, by Race (%)

Percent Seen Someone Shot At		
Race	Age Range	
	< 12	12-18
Black	26.07**	31.40**
White	7.59**	11.63**

Percent Typically Hear Gunshots					
Race	Days Per Week				
	0	1	2	3	4+
Black	61.44	14.27	8.47	5.23	10.59
White	83.00	7.63	2.82	1.92	4.62

Percent At School			
Race	Had Something Stolen	Have Ever:	
		Been Threatened	Been in a Fight
Black	32.32**	22.16	33.08**
White	24.53**	23.64	19.66**

Percent At School		
Race	Strongly Agree	Feel Safe:
		Disagree or Strongly Disagree
Black	22.39**	20.72**
White	35.24**	10.53**

Table 3: NLSY97 Males' Family and Peer Variables, by Race (%)

Parents' Expectations				
Race	Percent Chance of Child Receiving:			
	HS Diploma by 20		College Degree by 30	
	Mean	Median	Mean	Median
Black	89.72	100	64.59	70.00
White	95.29	100	66.12	75.00

Peer Group	
Race	Percent of Peers Planning on Going to College ≈25% Or Less
Black	22.46**
White	14.17**

Resident Mother's Highest Grade Completed		
	Percent of Mothers Completing:	
	≤11th Grade	≥4th Year College
Black	24.22**	11.52**
White	15.82**	23.26**

Family Structure	
	Percent Living with a Father Figure
Black	53.19**
White	81.96**

Table 4: NLSY97 Males' Time Use, Peer Groups, and School Effort, by Race

Time Use						
Race	Hours Per Week Typically Spent					
	On Homework		Reading For Pleasure		Watching TV	
	Mean	Median	Mean	Median	Mean	Median
Black	4.76	4.00	3.16	0.50	25.06	22.00
White	4.79	3.75	2.53	0.50	17.77	15.00

Peer Group					
Race	Percent of Peers Cut Class				
	<10%	≈25%	≈50%	≈75%	>90%
Black	24.85	25.78	22.16	15.33	11.88
White	38.60	29.68	17.87	8.25	5.61

School Effort		
Percent of NLSY97 Males Who	Black	White
Spend \geq 2 Hours Per Week on Homework n	69.90 711	72.36 1,646
Missed > 10 Days During the 1997-1998 Year n	38.93* 262	30.67* 626
Missed > 10 Days During the 1998-1999 Year n	40.63* 256	32.95* 601
Tardy > 10 Times During the 1997-1998 Year n	34.91** 106	14.94** 261
Tardy > 10 Times During the 1998-1999 Year n	19.39 98	16.00 250
Were Suspended During 7 th Grade n	33.04** 1,156	14.47** 2,613
Were Suspended During 10 th Grade n	24.14** 990	13.41** 2,409
Were Ever Late Without an Excuse n	47.97** 1,180	36.60** 2,675

Table 5: Educational Attainment, Males in the NLSY97 by Race (%)

Educational Attainment at Age 12		
Grade Enrolled at Age 12		
g(12)	Black	White
3	0.17	0.11
4	1.51	0.67
5	11.37	4.42
6	35.20	32.95
7	46.99	59.07
8	4.52	2.67
9	0.25	0.07
10	0.00	0.04
n	1,196	2,695

Educational Attainment at Age 20		
Percent with at Least a HS Diploma Conditional on Grade Enrolled at Age 12		
g(12)	Black	White
4	0.00	8.33
5	19.17	28.13
6	49.72	70.16
7	78.62	87.32
8	77.78	81.97

Table 6: Age of Black Males in the NLSY97

On Interview Date										
Age	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
12	137	-	-	-	-	-	-	-	-	137
13	228	4	-	-	-	-	-	-	-	232
14	249	196	8	-	-	-	-	-	-	453
15	269	220	202	1	-	-	-	-	-	692
16	229	257	210	184	4	-	-	-	-	884
17	81	251	251	221	177	-	-	-	-	981
18	5	184	225	241	217	191	2	-	-	1,065
19	-	19	176	230	227	210	192	3	-	1,057
20	-	-	17	182	213	244	200	167	5	1,028
21	-	-	-	30	160	218	221	190	167	986
22	-	-	-	-	19	168	230	210	196	823
23	-	-	-	-	-	27	180	204	222	633
24	-	-	-	-	-	-	17	173	210	400
25	-	-	-	-	-	-	-	15	156	171
Total	1,198	1,131	1,089	1,089	1,017	1,058	1,042	962	956	9,542

In October of School Year										
Age	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
12	35	-	-	-	-	-	-	-	-	35
13	223	32	-	-	-	-	-	-	-	255
14	238	213	33	-	-	-	-	-	-	484
15	281	225	211	33	-	-	-	-	-	750
16	246	275	222	205	34	-	-	-	-	982
17	175	231	263	223	198	32	-	-	-	1,122
18	-	155	216	259	210	208	33	-	-	1,081
19	-	-	144	220	236	214	194	30	-	1,038
20	-	-	-	149	203	250	204	186	30	1,022
21	-	-	-	-	136	216	247	186	185	970
22	-	-	-	-	-	138	220	232	197	787
23	-	-	-	-	-	-	144	194	231	569
24	-	-	-	-	-	-	-	134	196	330
25	-	-	-	-	-	-	-	-	133	133
Total	1,198	1,131	1,089	1,089	1,017	1,058	1,042	962	972	9,558

Table 7: Work and School Choices of Black Males (%)

Data				
Age	Work	School	Neither	n
12	0.00	100	0.00	1,196
13	0.00	99.41	0.59	1,192
14	0.00	98.31	1.69	1,184
15	0.43	95.90	3.68	1,170
16	1.82	91.16	7.02	1,154
17	6.97	75.69	17.34	1,119
18	23.06	52.69	24.26	1,080
19	38.34	31.60	30.06	1,038
20	45.53	22.67	31.80	1,019
21	50.77	16.41	32.82	969
22	55.04	12.90	32.06	783
23	61.96	8.04	30.00	560
24	66.77	3.05	30.18	328
25	70.77	1.54	27.69	130

Simulations			
Age	Work	School	Neither
12	0.00	98.91	1.10
13	0.00	98.24	1.76
14	0.00	96.83	3.17
15	0.00	93.37	6.63
16	4.71	85.15	10.14
17	11.91	71.24	16.85
18	29.80	47.77	22.43
19	44.52	29.45	26.02
20	49.84	21.16	29.00
21	49.92	17.62	32.46
22	51.10	14.25	34.64
23	56.18	10.93	32.89
24	60.77	7.91	31.32
25	66.26	5.70	28.04

Age	Work				School				Neither or Prison				n
	Decent	Violent	Non-Violent	Both	Decent	Violent	Non-Violent	Both	Decent	Violent	Non-Violent	Both	
12	0.00	0.00	0.00	0.00	48.60	7.48	26.40	17.52	0.00	0.00	0.00	0.00	428
13	0.00	0.00	0.00	0.00	49.30	8.22	24.34	17.52	0.16	0.00	0.00	0.47	645
14	0.00	0.00	0.00	0.00	51.08	6.37	23.44	17.29	0.68	0.11	0.57	0.46	879
15	0.09	0.09	0.09	0.09	50.14	8.57	22.46	14.82	1.30	0.56	0.93	0.75	1,073
16	0.89	0.27	0.27	0.27	53.24	6.21	18.63	13.58	3.19	0.98	1.15	1.33	1,127
17	3.54	0.91	1.27	1.00	46.96	5.99	14.71	8.90	7.72	2.00	3.18	3.81	1,101
18	15.35	3.63	1.58	2.51	34.79	3.72	9.40	5.02	15.26	1.77	3.07	3.91	1,075
19	27.12	4.44	3.86	2.90	24.90	2.51	2.90	1.35	19.98	3.38	3.67	2.99	1,036
20	36.04	3.96	2.67	3.17	18.42	2.08	1.78	0.40	21.49	2.87	4.06	3.07	1,010
21	41.85	4.57	2.80	1.66	14.64	0.73	0.62	0.52	22.12	4.36	3.53	2.60	963
22	45.23	5.15	3.22	1.68	11.73	0.77	0.39	0.13	25.00	2.32	2.32	2.06	776
23	52.60	5.57	1.97	1.80	6.82	0.36	0.54	0.36	25.12	1.08	1.62	2.15	557
24	59.33	5.50	1.22	0.61	2.75	0.00	0.00	0.31	26.30	2.45	0.61	0.92	327
25	61.72	8.59	0.78	0.78	1.56	0.00	0.00	0.00	24.22	2.34	0.00	0.00	128

Table 8: Work, School, and Street Choices of Black Males, Data (%)

Table 9: Work, School, and Street Choices of Black Males, Simulated from the Estimated Model (%)

Age	Work				School				Neither or Prison			
	Decent	Violent	Non-Violent	Both	Decent	Violent	Non-Violent	Both	Decent	Violent	Non-Violent	Both
12	0.00	0.00	0.00	0.00	48.24	8.44	25.03	17.19	1.09	0.01	0.00	0.00
13	0.00	0.00	0.00	0.00	50.97	9.18	25.49	12.60	1.71	0.05	0.01	0.00
14	0.00	0.00	0.00	0.00	48.97	8.21	24.75	14.90	2.93	0.14	0.06	0.04
15	0.00	0.00	0.00	0.00	45.97	7.14	23.17	17.09	5.55	0.49	0.33	0.26
16	3.87	0.47	0.17	0.19	41.07	5.86	20.92	17.29	7.88	0.94	0.78	0.55
17	9.13	1.69	0.57	0.52	35.36	4.43	16.65	14.79	12.04	1.82	1.77	1.22
18	21.49	4.73	1.91	1.66	25.95	3.00	9.50	9.33	14.87	2.58	2.74	2.24
19	30.51	7.89	2.88	3.24	19.21	1.59	4.47	4.18	16.90	3.35	3.17	2.60
20	34.78	8.50	2.98	3.58	16.07	0.70	2.80	1.58	19.51	3.83	3.27	2.39
21	36.78	7.99	2.78	2.38	14.14	0.63	2.01	0.84	22.31	4.05	3.65	2.45
22	39.20	7.14	2.69	2.07	11.31	0.60	1.73	0.61	24.83	3.86	3.69	2.27
23	43.70	7.75	2.65	2.07	8.60	0.41	1.42	0.51	23.10	3.80	3.92	2.07
24	48.06	8.05	2.61	2.04	6.32	0.30	0.99	0.32	22.39	3.65	3.43	1.85
25	53.26	8.91	2.69	1.40	4.67	0.24	0.57	0.22	20.93	3.14	2.75	1.21

Table 10: Transition Matrices for Standard Human Capital Choices (% , n=5,000)

Row Matrix			
Choice ($t - 1$)	Choice (t)		
	Work	School	Neither
Work:			
Data	78.44	5.58	15.98
Sim.	78.40	3.86	17.70
School:			
Data	8.86	82.77	8.37
Sim.	10.98	82.50	6.46
Neither or Prison:			
Data	26.25	8.30	65.45
Sim.	27.20	5.53	67.27

Column Matrix			
Choice ($t - 1$)	Choice (t)		
	Work	School	Neither
Work:			
Data	58.74	1.63	16.20
Sim.	66.21	2.31	23.06
School:			
Data	26.48	96.55	33.90
Sim.	17.89	95.47	16.25
Neither or Prison:			
Data	14.78	1.82	49.90
Sim.	15.90	2.29	60.69

Table 11: Transition Matrices for Street Behavior (% , n=5,000)

Row Matrix				
Choice ($t - 1$)	Choice (t)			
	Decent	Violent	Non-Violent	Both
Decent:				
Data	85.09	4.94	7.84	2.13
Sim.	84.33	6.42	7.10	2.23
Violent Street:				
Data	42.49	33.33	7.45	16.73
Sim.	40.75	33.08	11.25	14.92
Non-Violent Street:				
Data	48.02	4.73	38.36	8.89
Sim.	35.55	8.38	38.90	17.17
Both Street:				
Data	19.07	15.04	18.35	47.54
Sim.	20.89	16.01	22.74	40.37

Column Matrix				
Choice ($t - 1$)	Choice (t)			
	Decent	Violent	Non-Violent	Both
Decent:				
Data	79.74	36.81	35.47	13.78
Sim.	81.32	38.17	31.10	13.71
Violent Street:				
Data	5.37	33.50	4.55	14.64
Sim.	6.43	32.16	8.06	15.00
Non-Violent Street:				
Data	11.60	9.08	44.71	14.85
Sim.	8.63	12.53	42.87	26.56
Both Street:				
Data	3.29	20.61	15.28	56.73
Sim.	3.64	17.15	17.96	44.74

Table 12: Participation in Street Activities in Past Year, by Race and Age (%)

Age	Violent				Non-Violent					
	Gun	Gang	Attack	s_v	Suspended	Drugs	Stolen	Property	Arrested	s_{nv}
12	7.64	3.48	23.68	26.44	27.98	2.24	7.67	19.10	3.51	46.24
13	9.30	5.03	21.92	26.27	30.60	3.77	8.27	12.98	5.15	43.64
14	9.42	6.63	21.01	24.68	30.72	5.04	8.60	11.96	8.18	41.30
15	10.01	6.00	20.22	25.26	28.41	7.24	7.41	9.64	9.10	39.13
16	9.83	5.60	16.64	22.55	21.87	7.61	5.69	8.09	10.18	35.53
17	10.42	4.75	15.00	22.61	16.59	7.55	5.44	5.64	10.99	32.79
18	9.95	4.39	11.76	20.04	7.41	8.44	3.01	4.71	13.01	25.45
19	9.38	4.05	8.70	16.67	2.03	6.76	3.94	3.62	8.98	18.00
20	8.80	3.97	6.75	15.30	0.39	5.68	2.03	2.99	9.82	15.24
21	8.70	3.61	4.89	13.77	0.31	4.00	1.78	1.89	7.29	11.69
22	8.94	1.38	4.07	11.95	0.38	4.21	0.98	0.42	6.46	10.00
23	8.07	1.32	3.92	11.09	0.18	2.15	0.78	1.17	6.49	7.86
24	7.69	0.32	2.32	9.06	0.00	1.00	1.66	0.99	1.53	3.67
25	10.83	0.00	2.48	12.50	0.00	0.83	0.00	0.83	0.00	1.67

Table 13: High School Dropout and Incarceration

Black Males with Highest Grade Completed ≤ 11 (%)		
Age	Data	Simulations
16	100	100
17	96.98	96.41
18	62.69	67.51
19	42.27	48.70
20	38.74	41.17
21	37.59	39.62
22	37.19	38.51
23	36.96	37.41
24	37.46	36.51
25	37.21	35.84

Incarceration of Black Males (%)	
Age	≥ 6 Months
12	1.89
13	3.02
14	3.45
15	3.77
16	3.55
17	3.23
18	3.25
19	3.15
20	2.95
21	2.53
22	2.54
23	2.35
24	2.05
25	2.10

Table 14: Wages of Black Males

Age	Data				Predicted			
	Mean	Median	σ	n	Mean	Median	σ	n
18	10,355	9,477	6,033	223	9,039	7,297	6,871	1,583
19	11,223	9,555	8,305	359	10,017	7,864	8,120	2,316
20	12,567	11,105	9,622	406	10,877	8,508	8,749	2,444
21	11,847	9,575	10,420	431	11,737	9,371	9,500	2,442
22	12,814	10,440	11,511	388	12,425	9,346	10,726	2,466
23	11,860	9,486	9,759	307	12,055	8,519	11,604	2,729
24	12,080	8,583	12,295	198	12,579	7,628	14,024	3,013
25	8,745	6,873	6,884	82	12,360	6,754	15,676	3,353

Table 15: Model Estimates

	Parameter	Standard Error
Work		
$\alpha_0(1)$	7.652	3.00E-3
$\alpha_0(2)$	6.552	3.50E-3
$\alpha_0(3)$	6.765	7.56E-3
$\alpha_0(4)$	6.930	1.60E-3
α_1	0.149	6.18E-6
α_2	0.354	8.47E-7
α_3	-0.0698	7.21E-7
α_4	-5,872	1.57E+3
ρ	252	6.50E+2
Neither Work Nor School		
$\gamma_0(1)$	-13,788	2.06E+6
$\gamma_0(2)$	1,852	2.93E+4
$\gamma_0(3)$	2,852	1.21E+4
$\gamma_0(4)$	913	6.79E+3
γ_1	834	3.75E-4
γ_2	931	1.71E+2
γ_3	6,052	1.54E+2
Violent		
$\phi_0(1)$	-2,212	6.67E+4
$\phi_0(2)$	4,858	3.71E+2
$\phi_0(3)$	3,552	1.72E-2
$\phi_0(4)$	-3,061	2.68E+2
ϕ_1	232	3.86E-1
ϕ_2	2,485	1.82E-1
ϕ_3	479	1.18E+9
$\phi_4 + \psi_4$	-948	1.69E+3
Type Proportions		
$\pi_1 _{g(12)\leq 5}$	0.102	5.88E-9
$\pi_2 _{g(12)\leq 5}$	0.194	9.39E-7
$\pi_3 _{g(12)\leq 5}$	0.485	2.83E-7
$\pi_4 _{g(12)\leq 5}$	0.219	-
$\pi_1 _{g(12)\geq 6}$	0.166	1.27E-4
$\pi_2 _{g(12)\geq 6}$	0.119	6.19E-5
$\pi_3 _{g(12)\geq 6}$	0.348	4.97E-7
$\pi_4 _{g(12)\geq 6}$	0.367	-

Table 16: Model Estimates (Continued)

	Parameter	Standard Error
School		
	$\beta_0(1)$	39,522
	$\beta_0(2)$	6.42E+3
	$\beta_0(3)$	9,710
	$\beta_0(4)$	5.54E+4
	β_1	9,624
	β_2	8.63E+4
	β_3	8,295
	β_4	1.08E+5
	β_5	-10,533
		9.86E+4
		6.09E+3
		1.00E+5
		2.12
		3.70E+2
Incarceration		
	$\lambda_0(1)$	-6.00
	$\lambda_0(2)$	1.02E-8
	$\lambda_0(3)$	-5.02
	$\lambda_0(4)$	1.11E+1
	λ_1	-4.49
	λ_2	2.3E-3
	λ_3	-5.48
	λ_4	3.32E-8
		0.24
		1.50E-3
		1.17
		5.68E-7
		4.65
		1.20E-2
		0.33
		1.69E-6
Non-Violent		
	$\psi_0(1)$	-1,723
	$\psi_0(2)$	2,552
	$\psi_0(3)$	5,052
	$\psi_0(4)$	-2,111
	ψ_1	230
	ψ_2	1,512
	ψ_3	552
		2.77E+1
		2.39E+4
		5.75E+3
		8.39E+4
		1.23E+2
		7.64E-4
		1.56E+9
Pr[$s(\underline{a} - 1) = 1$]		
	$s_v(\underline{a} - 1) _{\tau=1}$	-1.99
	$s_v(\underline{a} - 1) _{\tau=2}$	0.65
	$s_v(\underline{a} - 1) _{\tau=3}$	-0.75
	$s_v(\underline{a} - 1) _{\tau=4}$	-1.52
		5.16E-6
		4.61E-4
		4.74E-7
		7.92E-8
	$s_{nv}(\underline{a} - 1) _{\tau=1}$	-1.99
	$s_{nv}(\underline{a} - 1) _{\tau=2}$	-0.75
	$s_{nv}(\underline{a} - 1) _{\tau=3}$	0.69
	$s_{nv}(\underline{a} - 1) _{\tau=4}$	-1.49
		6.13E-6
		8.39E-7
		8.06E-4
		2.49E-8

Table 17: Model Estimates (Continued)

	Parameter	Standard Error
Variances		
	σ_w^2	0.646
	σ_e^2	8,517
	σ_h^2	4,582
	σ_v^2	5,016
	σ_{nv}^2	4,137
Age 12		
	v_{12}	1,974
	i_{12}	2,052
	vi_{12}	1,052
Terminal Value Function		
	ζ_1	5,717
	ζ_2	17,629
	ζ_3	606
	ζ_4	722
Interaction Terms		
	θ_2	-9,698
	θ_3	-11,556
	θ_4	-20,548
	θ_6	-7,025
	θ_7	-4,038
	θ_9	-11,815
	θ_{10}	-12,817
	θ_{11}	-12,748
	θ_{12}	-23,548
Classification Error Rates		
	EW	0.17
	EC	0.77
	ESP	0.89
	ESV	0.78
	ESN	0.81
Ln Likelihood		-19,471

Table 18: Behavior by Type

	Type 1	Type 2	Type 3	Type 4
Working at 21	17.5	43.1	38.3	84.7
Enrolled in School				
At 16	99.4	82.6	83.3	82.5
At 21	82.5	6.3	9.1	5.9
Neither Working Nor Enrolled in School				
At 16	0.0	14.6	14.0	7.0
At 21	0.0	50.6	52.6	9.44
No High School Diploma at 21	0.1	51.7	48.2	39.4
College Degree at 24	82.1	0.6	2.0	0.7
Violent Street Capital Stock ≥ 2				
At 16	0.3	65.6	43.4	0.6
At 20	0.9	91.1	75.3	1.4
Non-Violent Street Capital Stock ≥ 2				
At 16	0.9	61.8	88.5	3.1
At 20	3.9	85.1	97.6	6.5

Table 19: Type Probabilities and Demographic Characteristics

Subsample (n)	Type 1	Type 2	Type 3	Type 4
Sample (1,196)	16.19	13.71	35.50	34.60
Personal Security				
Times/Week Typically Hear Gunshots in Nbd				
Zero (434)	18.67	14.50	30.90	35.93
Once or Twice (161)	12.99	12.70	34.24	40.06
At Least Three (112)	6.92	16.62	44.50	31.96
Seen Someone Shot at Before 12 (305)	9.18	17.62	48.26	24.93
At School				
Had Something Stolen (383)	16.01	13.84	39.14	31.01
Been Threatened (263)	8.99	17.01	46.18	27.81
Been in a Fight (392)	7.25	17.06	48.69	27.00
HH Structure at Age 14				
Do Not Live with Father Figure (556)	13.58	14.45	39.55	32.41
Live with Father Figure (634)	18.60	13.16	31.82	36.41
Mother's HGC ≤ 11 (247)	8.74	13.47	44.49	33.29
Mother's HGC ≥ 12 (776)	19.77	13.56	30.76	35.90

Table 20: Counterfactual I: No Neighborhood Effects (% , n=5,000)

Simulations from the Estimated Model				
Age	Work	School	Neither	HGC \leq 11
12	0.00	98.91	1.10	100
13	0.00	98.24	1.76	100
14	0.00	96.83	3.17	100
15	0.00	93.37	6.63	100
16	4.71	85.15	10.14	100
17	11.91	71.24	16.85	96.98
18	29.80	47.77	22.43	62.69
19	44.52	29.45	26.02	42.27
20	49.84	21.16	29.00	38.74
21	49.92	17.62	32.46	37.59
22	51.10	14.25	34.64	37.19
23	56.18	10.93	32.89	36.96
24	60.77	7.91	31.32	37.46
25	66.26	5.70	28.04	35.84

Counterfactual I: No Neighborhood Effects				
Age	Work	School	Neither	HGC \leq 11
12	0.00	98.09	1.92	100
13	0.00	97.07	2.93	100
14	0.00	95.54	4.47	100
15	0.00	92.41	7.59	100
16	5.55	85.55	8.90	100
17	13.76	74.67	11.58	96.42
18	33.81	53.04	13.15	66.49
19	53.15	34.30	12.55	45.72
20	63.21	23.86	12.93	35.99
21	67.14	19.11	13.74	33.93
22	70.65	14.91	14.44	32.37
23	77.30	10.88	11.82	31.13
24	82.62	8.05	9.34	30.17
25	88.14	5.62	6.24	29.31

Table 21: Counterfactual II: Starting Over (% , n=5,000)

Simulations from the Estimated Model				
Age	Work	School	Neither	HGC \leq 11
12	0.00	98.91	1.10	100
13	0.00	98.24	1.76	100
14	0.00	96.83	3.17	100
15	0.00	93.37	6.63	100
16	4.71	85.15	10.14	100
17	11.91	71.24	16.85	96.98
18	29.80	47.77	22.43	62.69
19	44.52	29.45	26.02	42.27
20	49.84	21.16	29.00	38.74
21	49.92	17.62	32.46	37.59
22	51.10	14.25	34.64	37.19
23	56.18	10.93	32.89	36.96
24	60.77	7.91	31.32	37.46
25	66.26	5.70	28.04	35.84

Counterfactual II: Starting Over				
Age	Work	School	Neither	HGC \leq 11
12	0.00	98.91	1.10	100
13	0.00	98.24	1.77	100
14	0.00	96.83	3.17	100
15	0.00	93.37	6.63	100
16	4.47	85.61	9.93	100
17	7.93	76.85	15.23	96.41
18	20.53	60.23	19.25	64.03
19	35.00	43.41	21.58	41.14
20	43.72	32.78	23.50	30.50
21	49.35	25.27	25.38	28.00
22	54.31	19.09	26.60	26.75
23	59.63	14.77	25.60	25.48
24	63.68	11.85	24.47	24.52
25	69.79	8.21	22.00	23.74

Table 22: Counterfactual III: Wage Subsidy (% , n=5,000)

Simulations from the Estimated Model				
Age	Work	School	Neither	HGC \leq 11
12	0.00	98.91	1.10	100
13	0.00	98.24	1.76	100
14	0.00	96.83	3.17	100
15	0.00	93.37	6.63	100
16	4.71	85.15	10.14	100
17	11.91	71.24	16.85	96.98
18	29.80	47.77	22.43	62.69
19	44.52	29.45	26.02	42.27
20	49.84	21.16	29.00	38.74
21	49.92	17.62	32.46	37.59
22	51.10	14.25	34.64	37.19
23	56.18	10.93	32.89	36.96
24	60.77	7.91	31.32	37.46
25	66.26	5.70	28.04	35.84

Counterfactual III: Wage Subsidy				
Age	Work	School	Neither	HGC \leq 11
12	0.00	99.06	0.94	100
13	0.00	98.47	1.53	100
14	0.00	97.11	2.90	100
15	0.00	93.26	6.75	100
16	8.53	82.74	8.74	100
17	19.56	67.26	13.18	96.50
18	40.61	43.27	16.11	68.70
19	56.12	25.95	17.94	51.63
20	61.28	19.04	19.68	44.93
21	61.43	16.15	22.42	43.73
22	61.92	13.14	24.94	42.84
23	66.37	9.92	23.71	41.83
24	70.82	7.09	22.10	41.07
25	75.04	5.60	19.91	40.48

Table 23: Counterfactual IV: Conditional Cash Transfer (% , n=5,000)

Simulations from the Estimated Model				
Age	Work	School	Neither	HGC \leq 11
12	0.00	98.91	1.10	100
13	0.00	98.24	1.76	100
14	0.00	96.83	3.17	100
15	0.00	93.37	6.63	100
16	4.71	85.15	10.14	100
17	11.91	71.24	16.85	96.98
18	29.80	47.77	22.43	62.69
19	44.52	29.45	26.02	42.27
20	49.84	21.16	29.00	38.74
21	49.92	17.62	32.46	37.59
22	51.10	14.25	34.64	37.19
23	56.18	10.93	32.89	36.96
24	60.77	7.91	31.32	37.46
25	66.26	5.70	28.04	35.84

Counterfactual IV: Conditional Cash Transfer				
Age	Work	School	Neither	HGC \leq 11
12	0.00	99.19	0.81	100
13	0.00	98.74	1.26	100
14	0.00	97.85	2.15	100
15	0.00	95.77	4.24	100
16	3.03	90.48	6.49	100
17	8.91	79.19	11.90	96.04
18	27.98	54.14	17.89	62.90
19	44.89	32.41	22.69	40.44
20	51.44	21.85	26.71	31.21
21	51.35	17.83	30.82	29.50
22	52.27	14.30	33.43	28.22
23	57.18	10.76	32.06	27.01
24	61.48	7.80	30.72	26.01
25	66.65	5.76	27.58	25.40

Figures

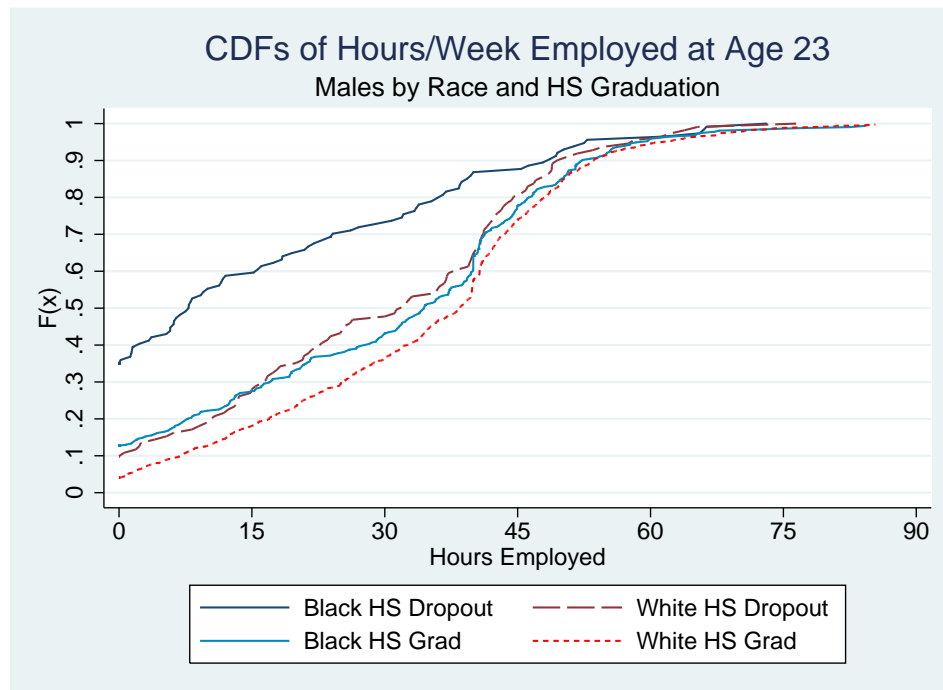


Figure 1: CDF of Hours/Week Worked at Age 23 by HS Dropout

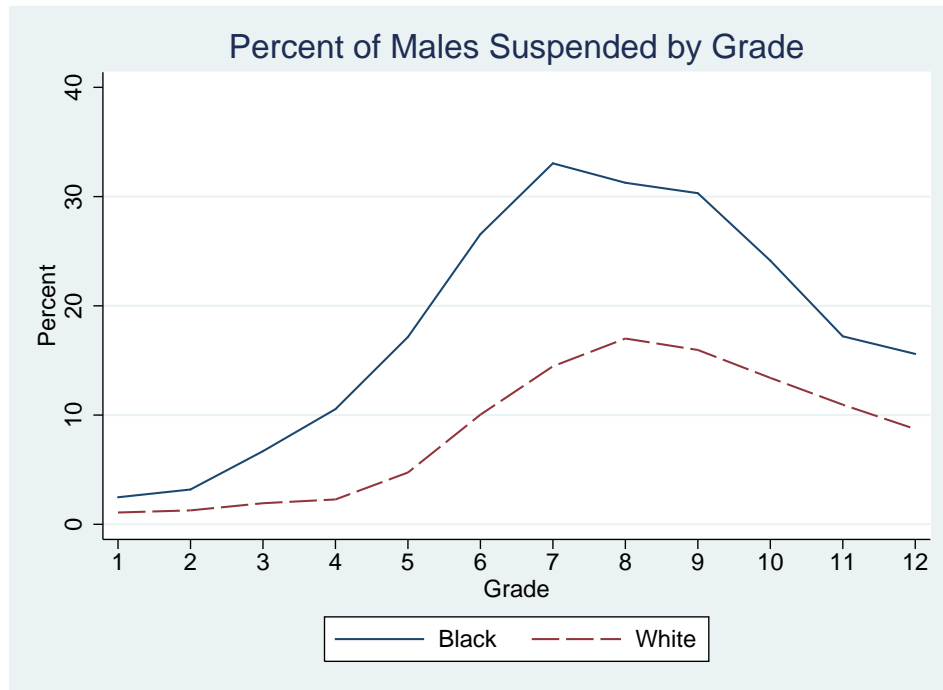


Figure 2: Suspensions

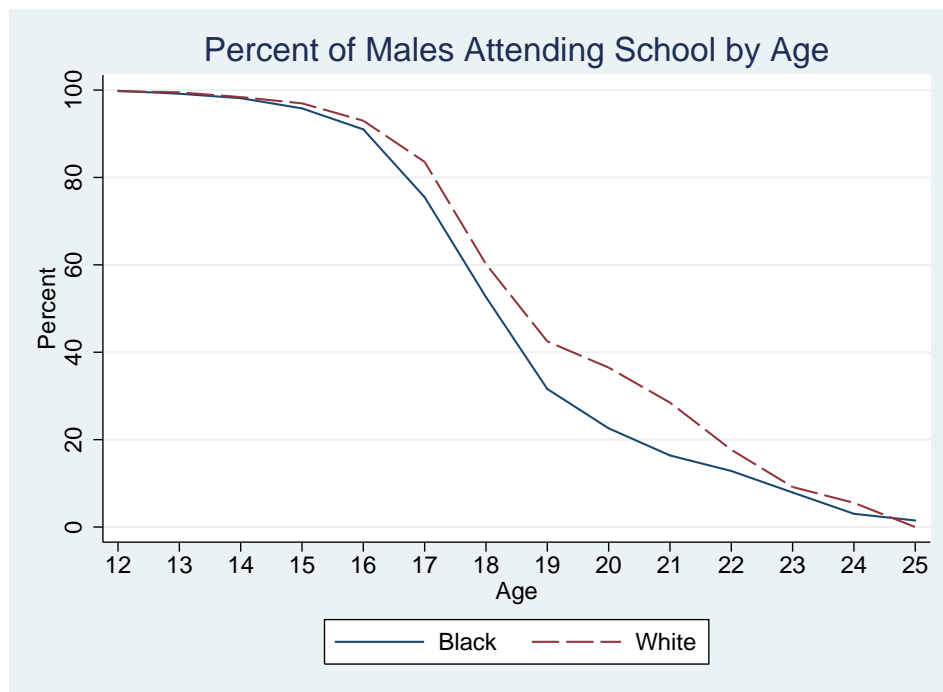


Figure 3: Attendance

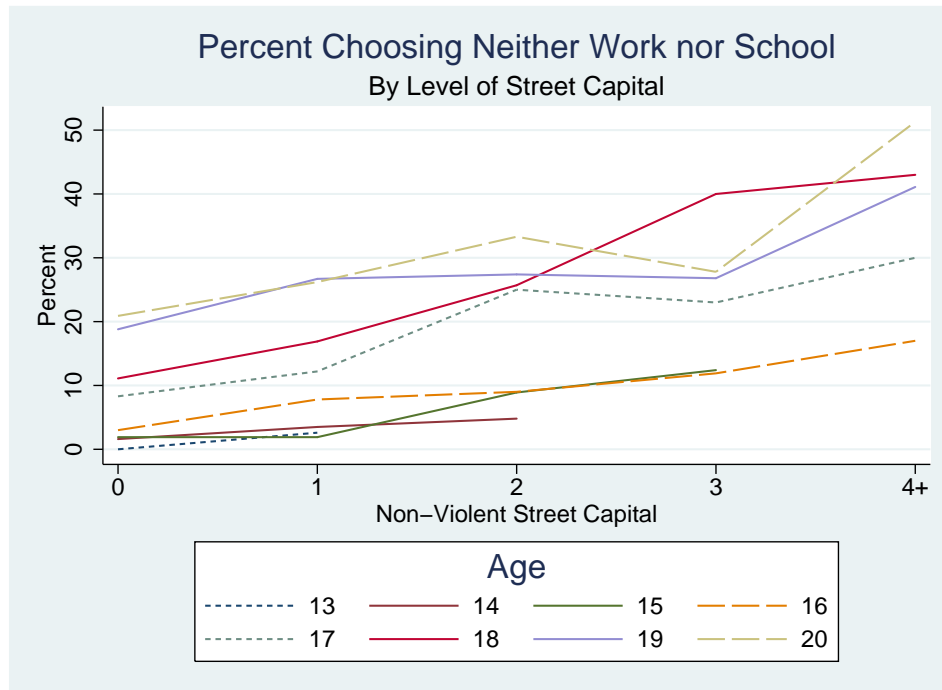


Figure 4: Black Males Choosing Neither to Work nor to Attend School, by x_{nv}

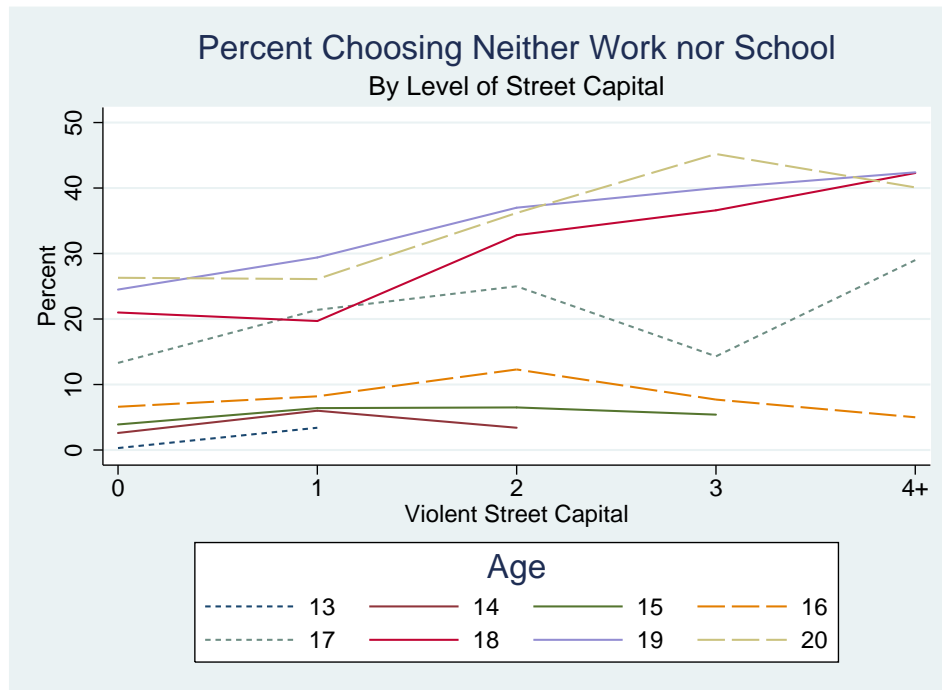


Figure 5: Black Males Choosing Neither to Work nor to Attend School, by x_v

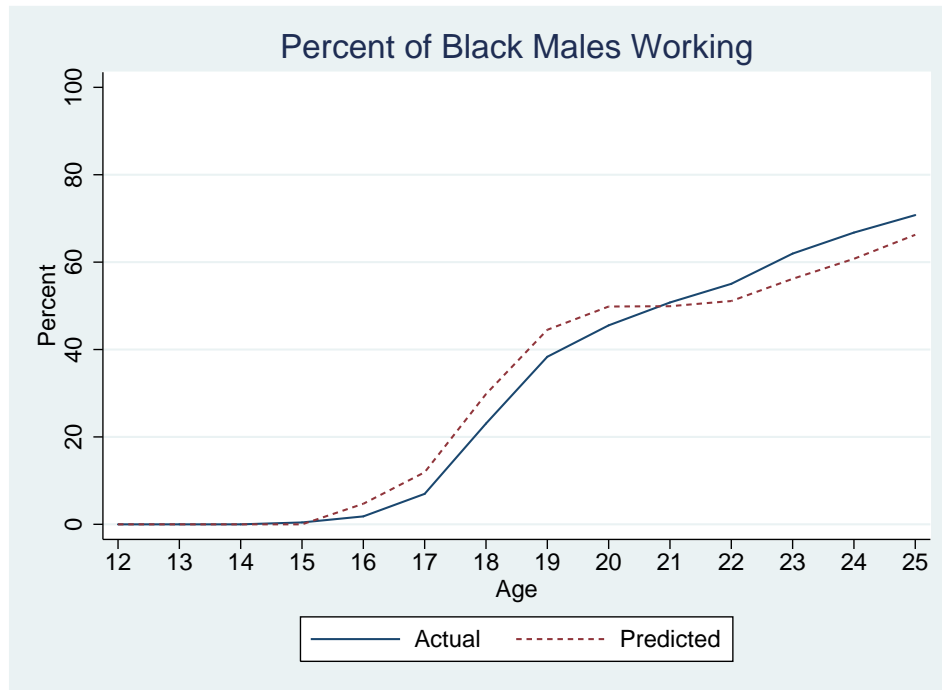


Figure 6: Estimated Model: Work

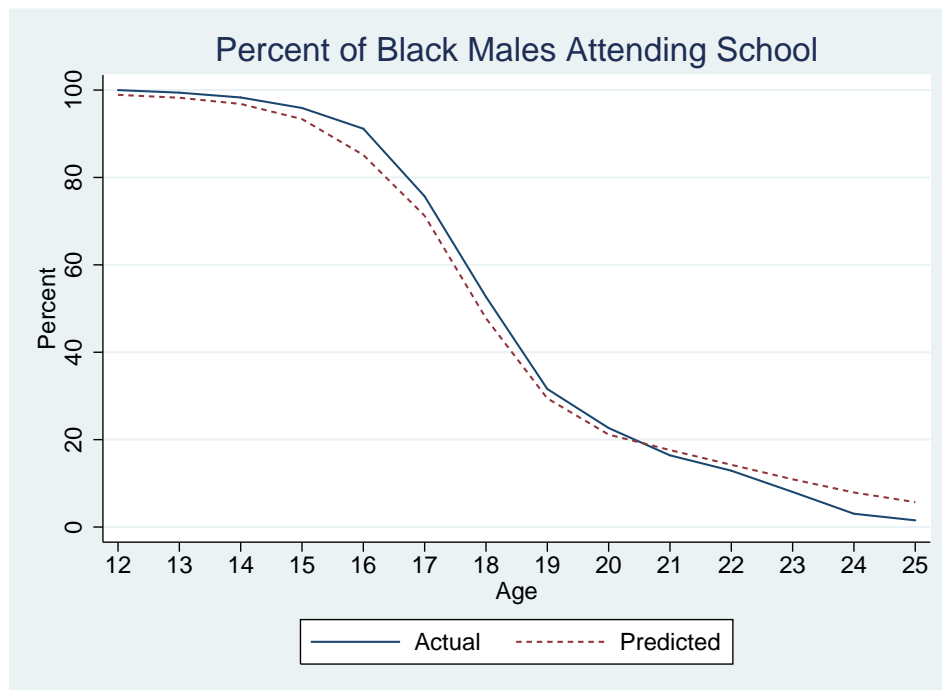


Figure 7: Estimated Model: School

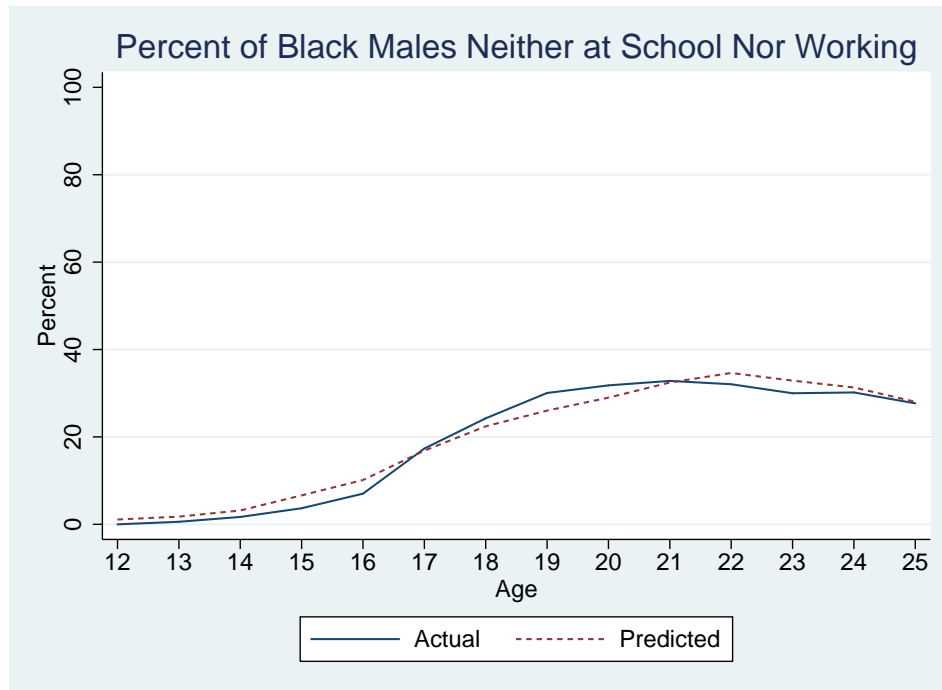


Figure 8: Estimated Model: Neither Work Nor School

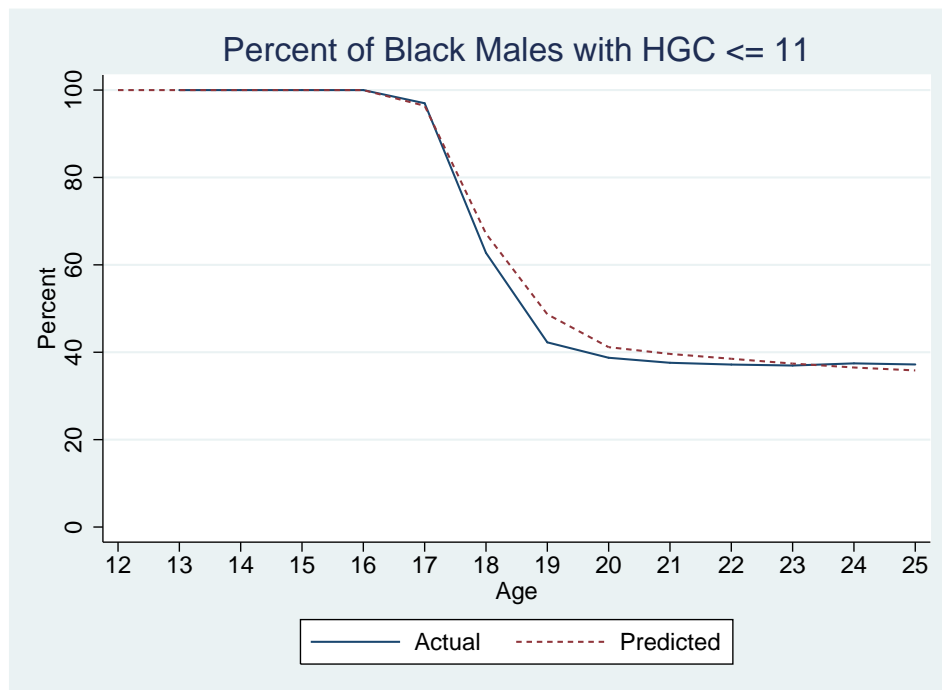


Figure 9: Estimated Model: High School Graduates

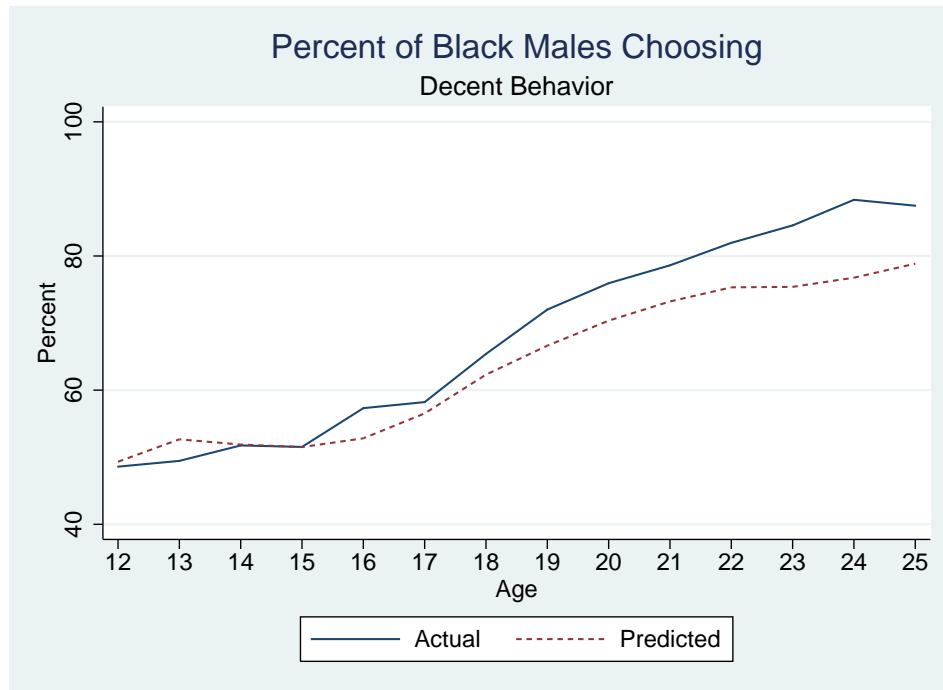


Figure 10: Estimated Model: Decent Behavior

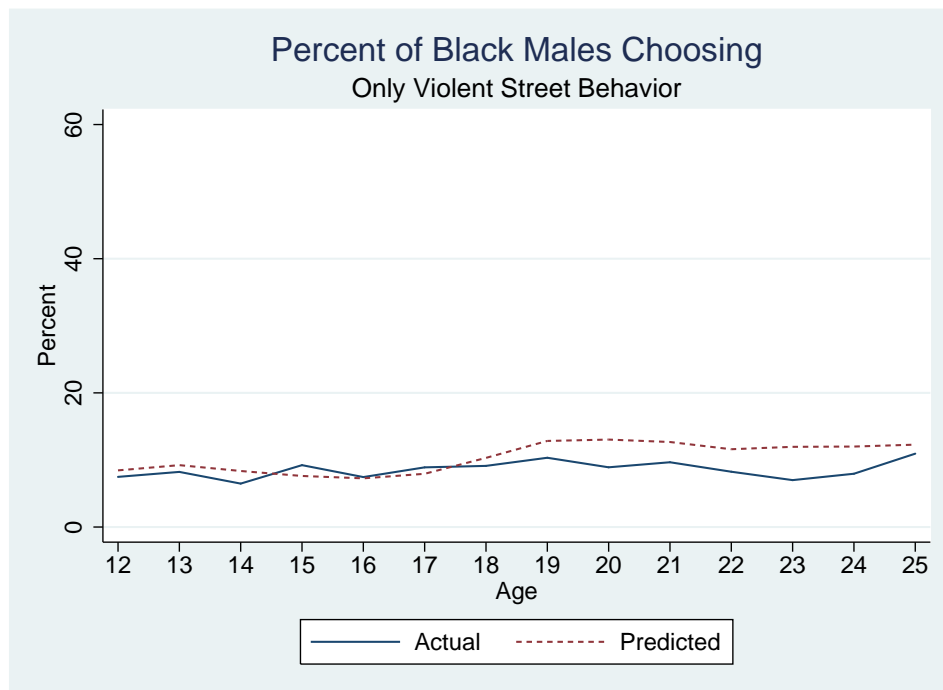


Figure 11: Estimated Model: Violent Street Behavior

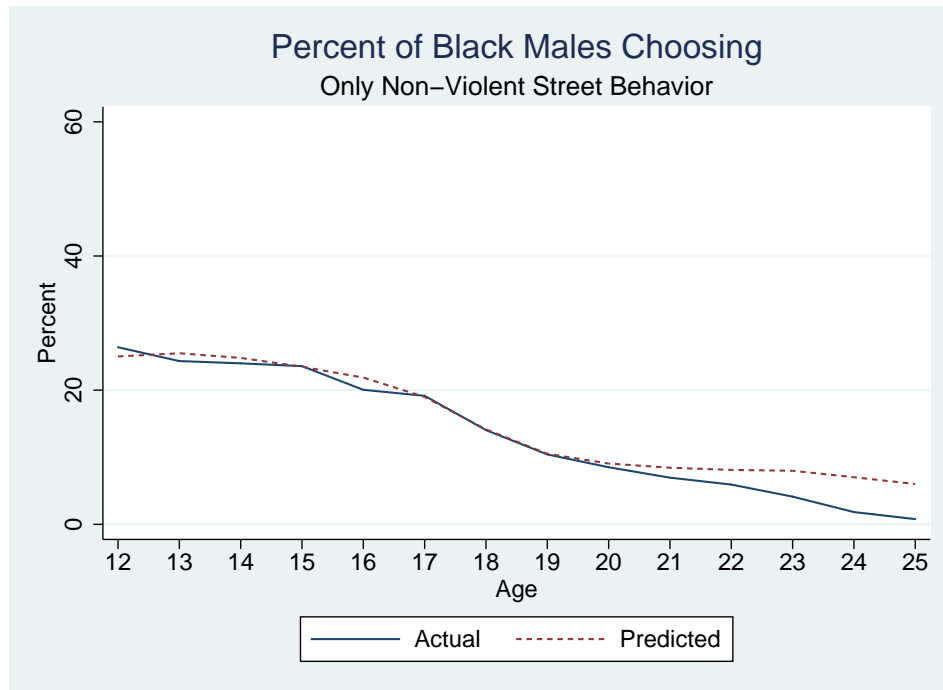


Figure 12: Estimated Model: Non-Violent Street Behavior

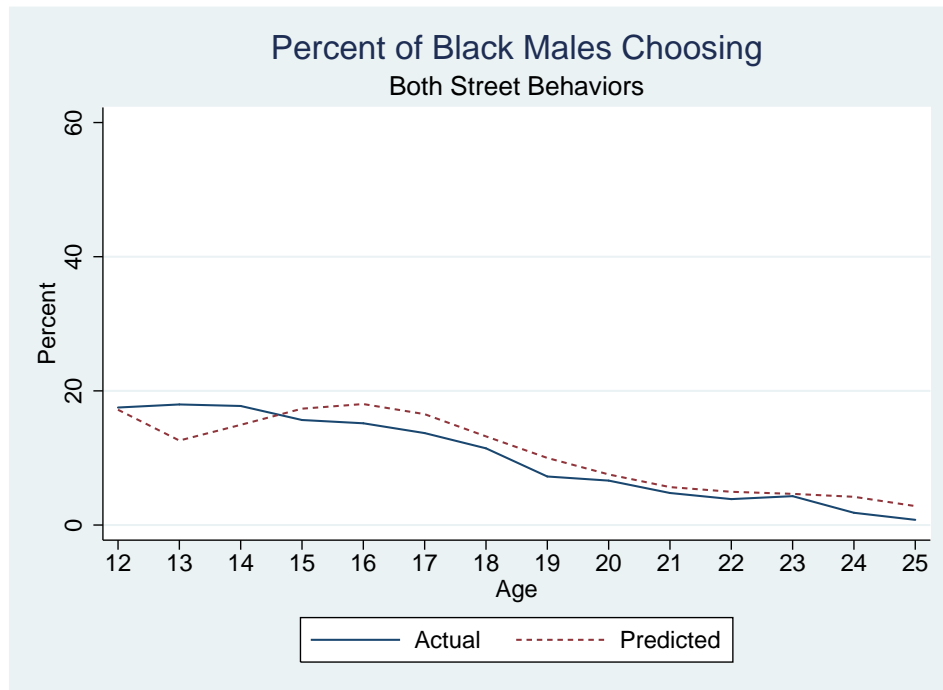


Figure 13: Estimated Model: Both Types of Street Behavior

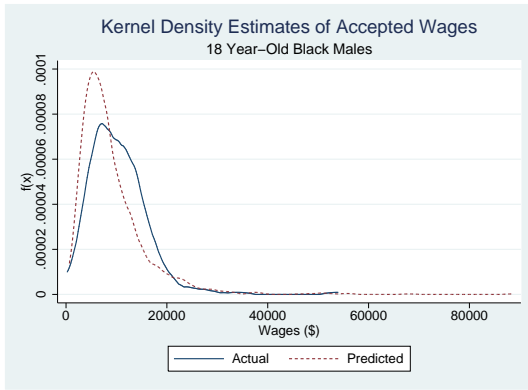


Figure 14: Est. Model: Wages at 18

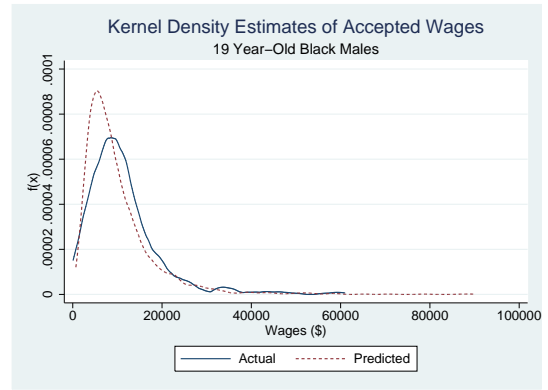


Figure 15: Est. Model: Wages at 19

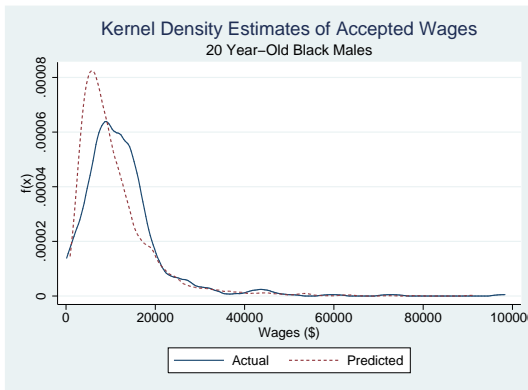


Figure 16: Est. Model: Wages at 20

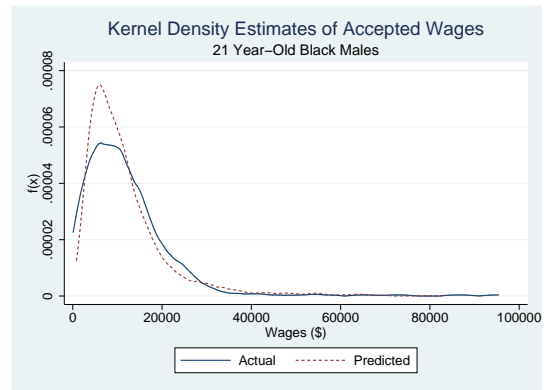


Figure 17: Est. Model: Wages at 21

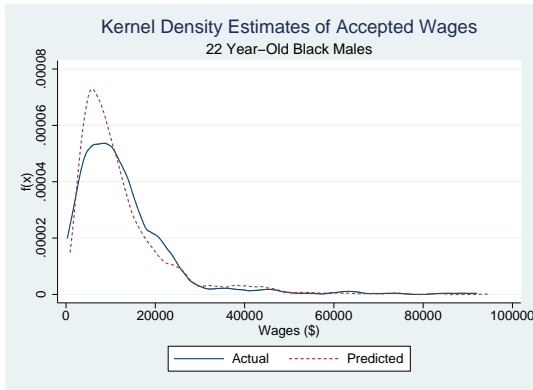


Figure 18: Est. Model: Wages at 22

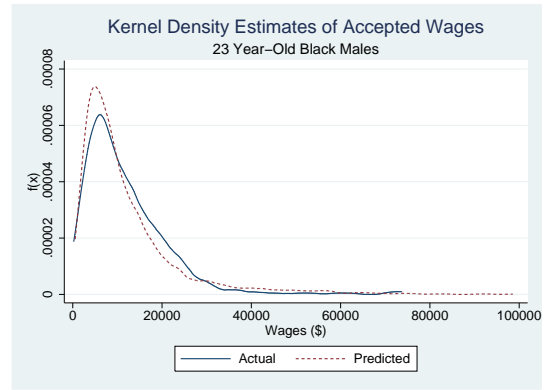


Figure 19: Est. Model: Wages at 23

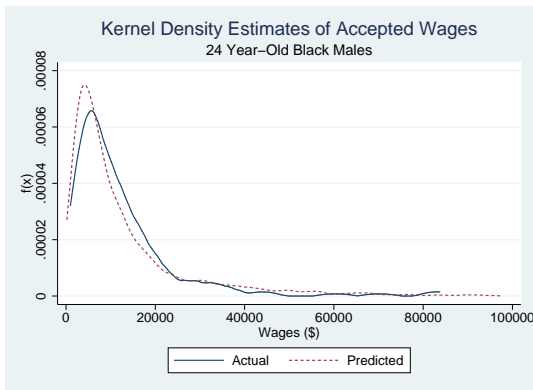


Figure 20: Est. Model: Wages at 24

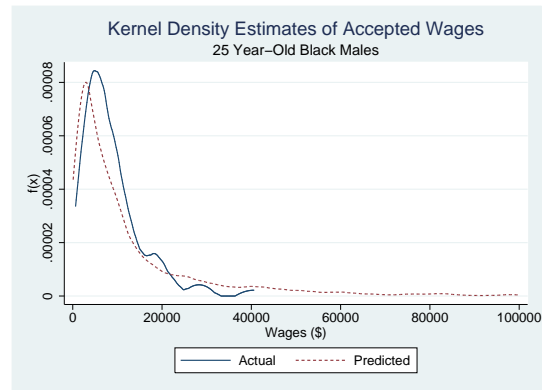


Figure 21: Est. Model: Wages at 25

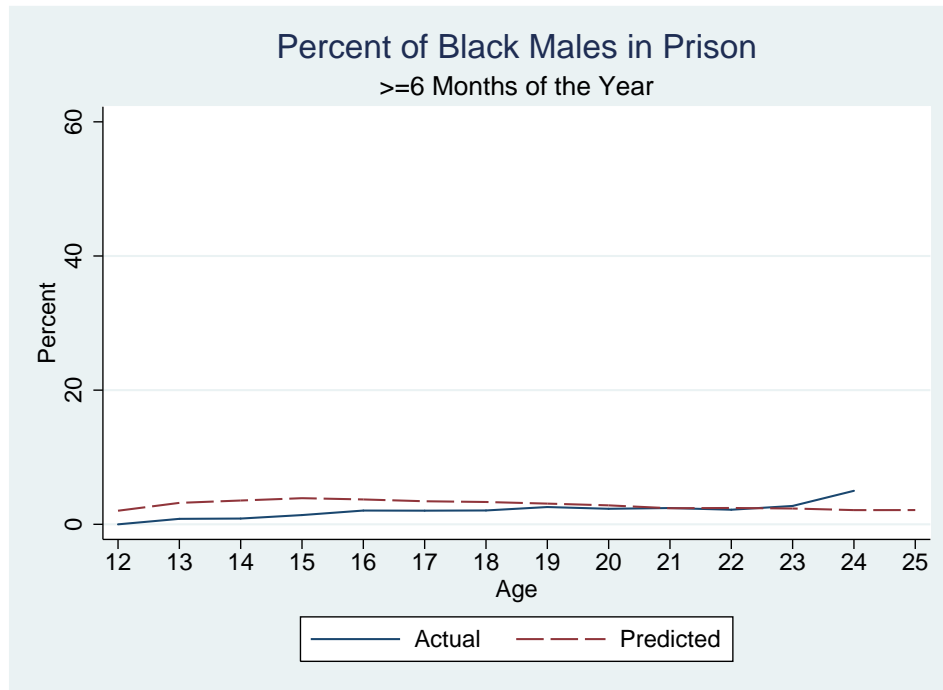


Figure 22: Estimated Model: Prison

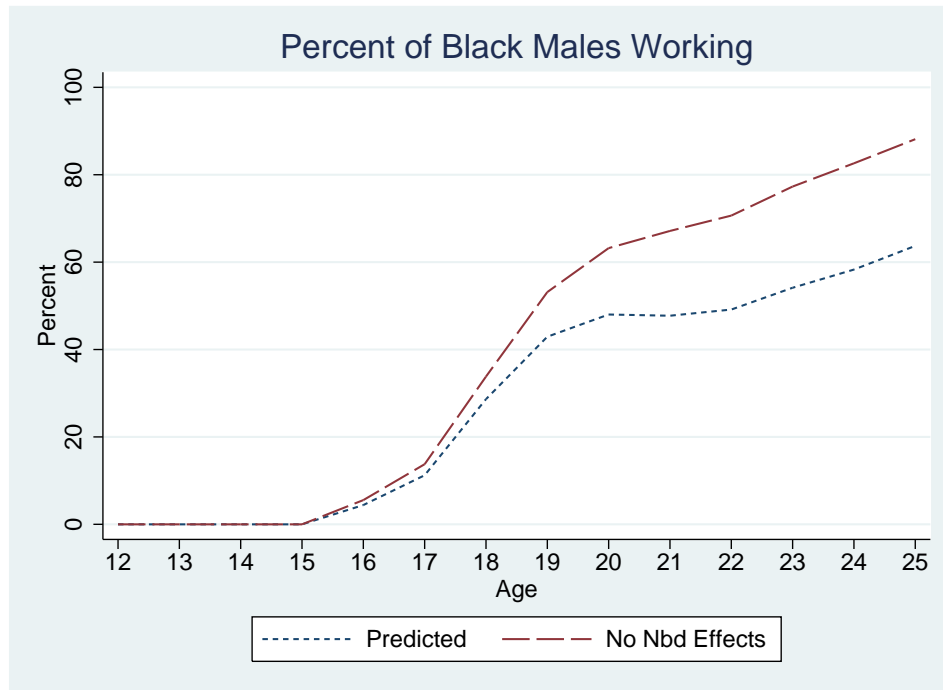


Figure 23: Counterfactual I: Work

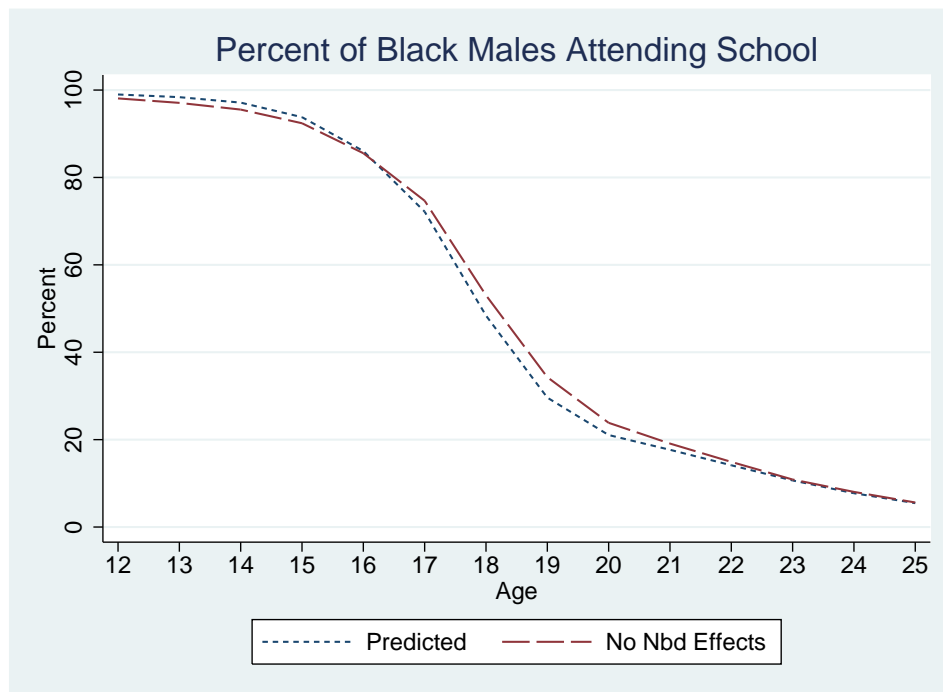


Figure 24: Counterfactual I: School

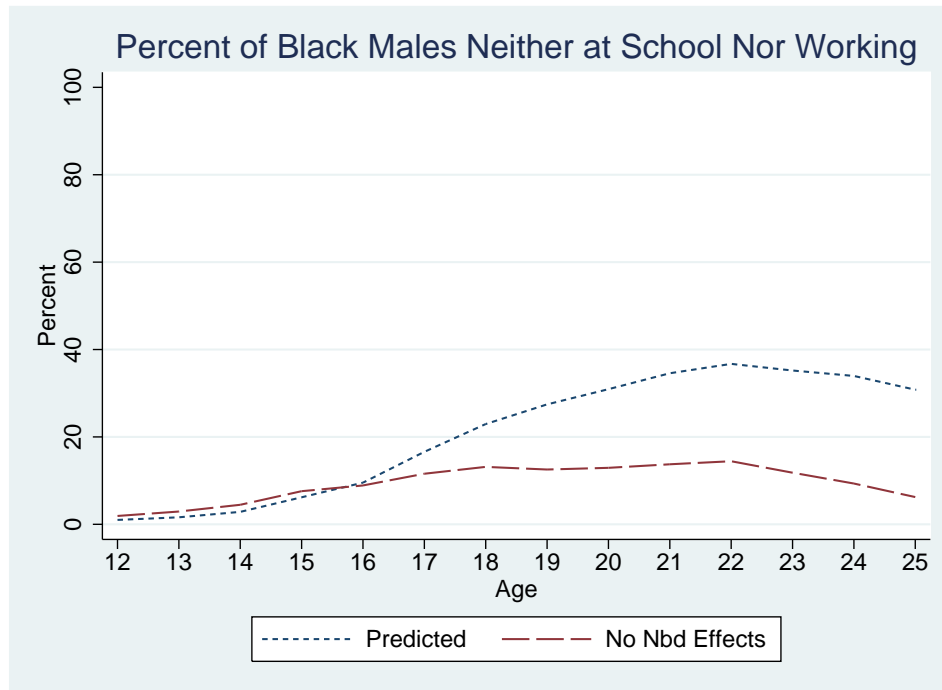


Figure 25: Counterfactual I: Neither Work Nor School

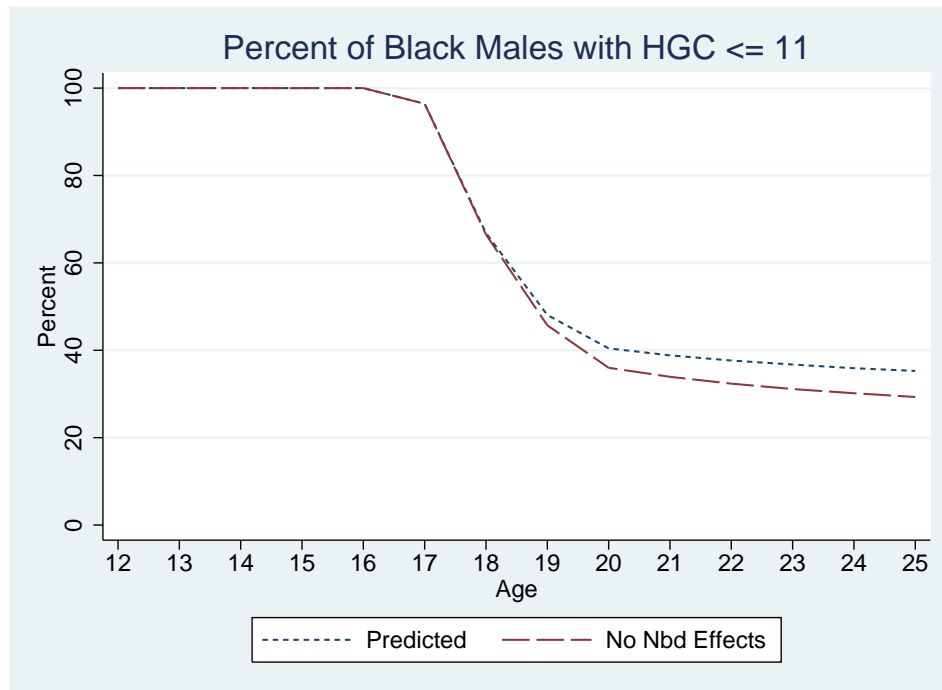


Figure 26: Counterfactual I: High School Graduates

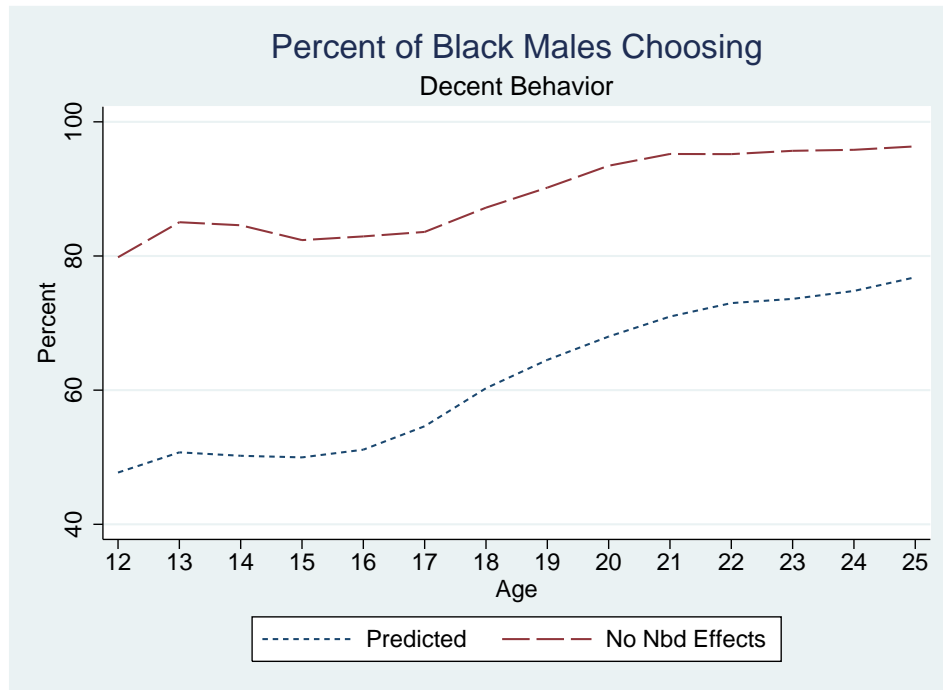


Figure 27: Counterfactual I: Decent Behavior

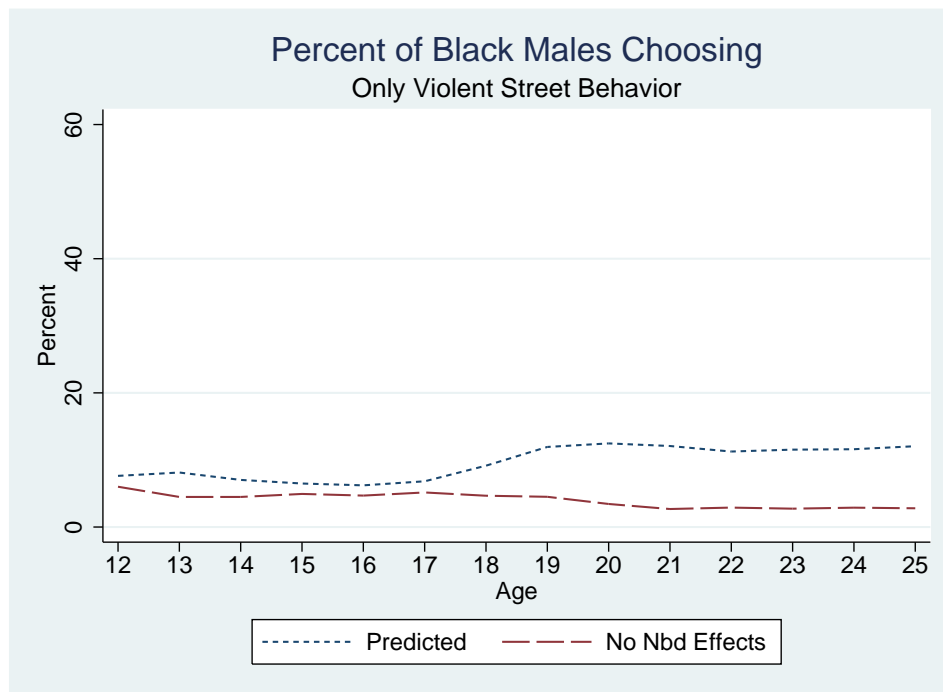


Figure 28: Counterfactual I: Violent Street Behavior

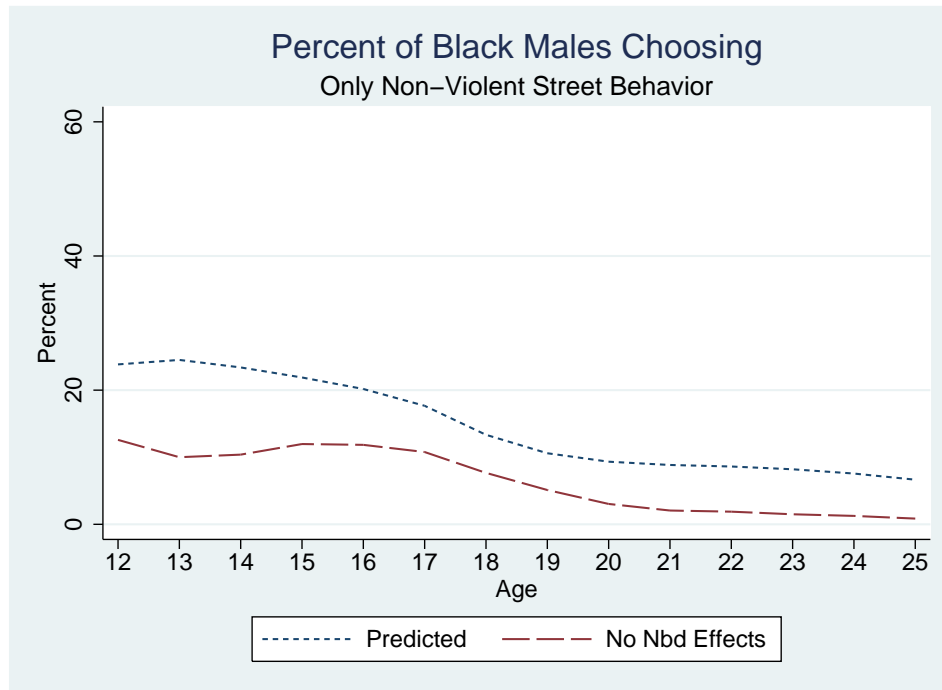


Figure 29: Counterfactual I: Non-Violent Street Behavior

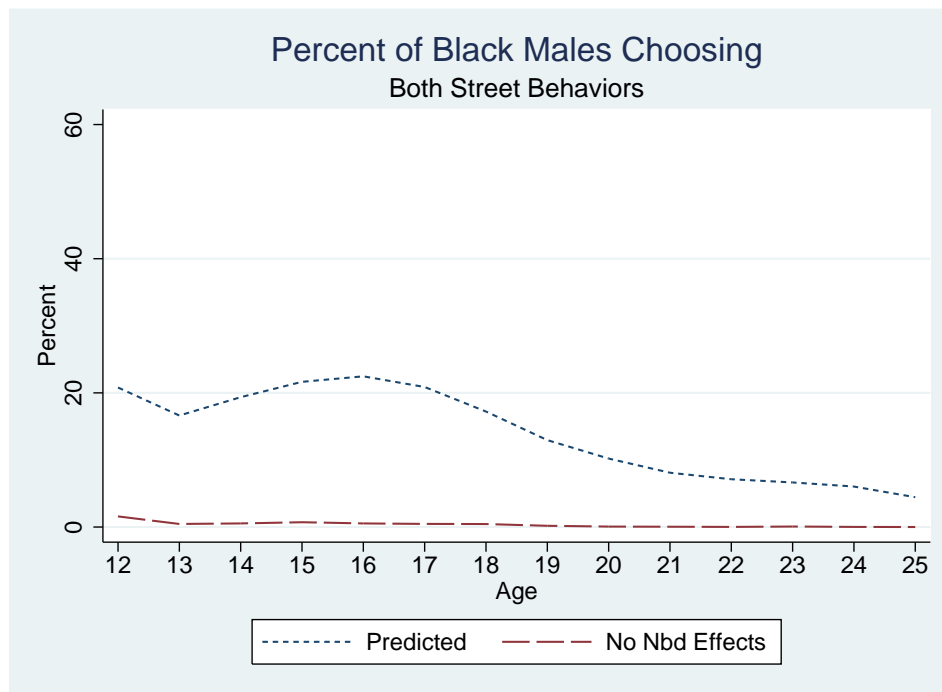


Figure 30: Counterfactual I: Both Types of Street Behavior

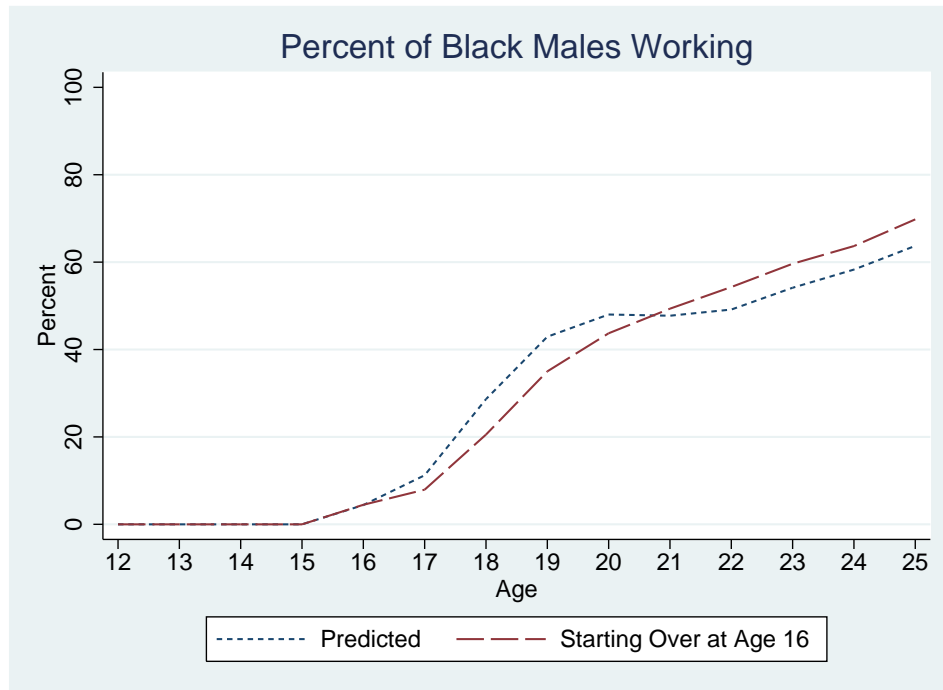


Figure 31: Counterfactual II: Work

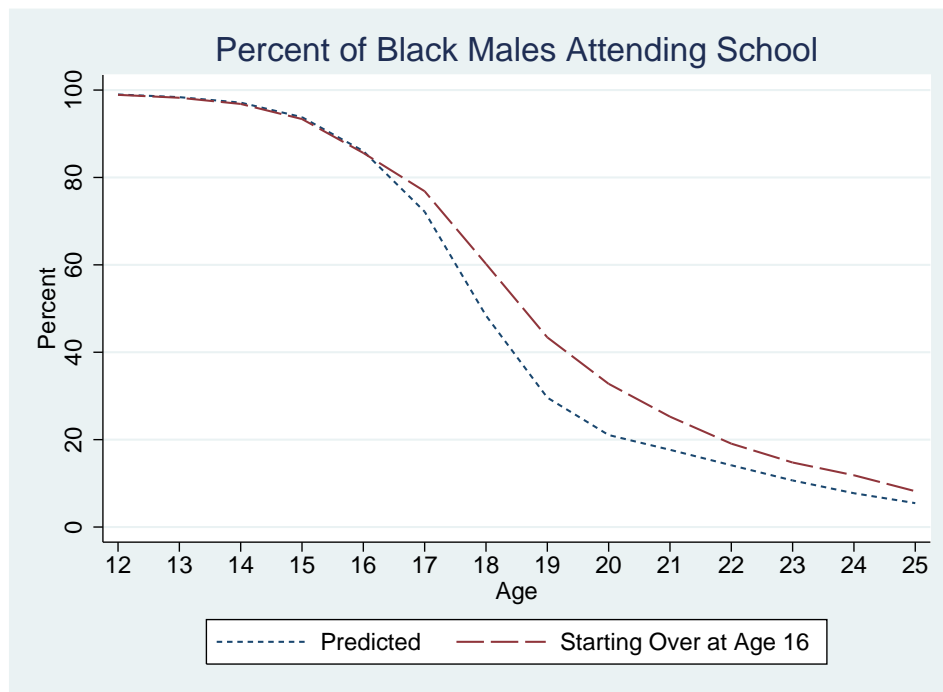


Figure 32: Counterfactual II: School

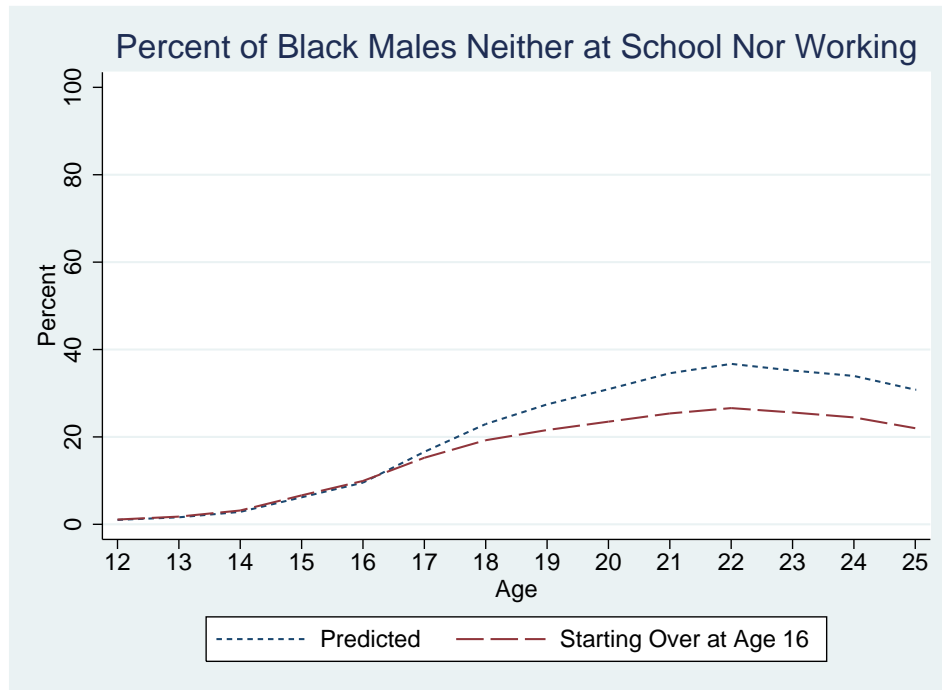


Figure 33: Counterfactual II: Neither Work Nor School

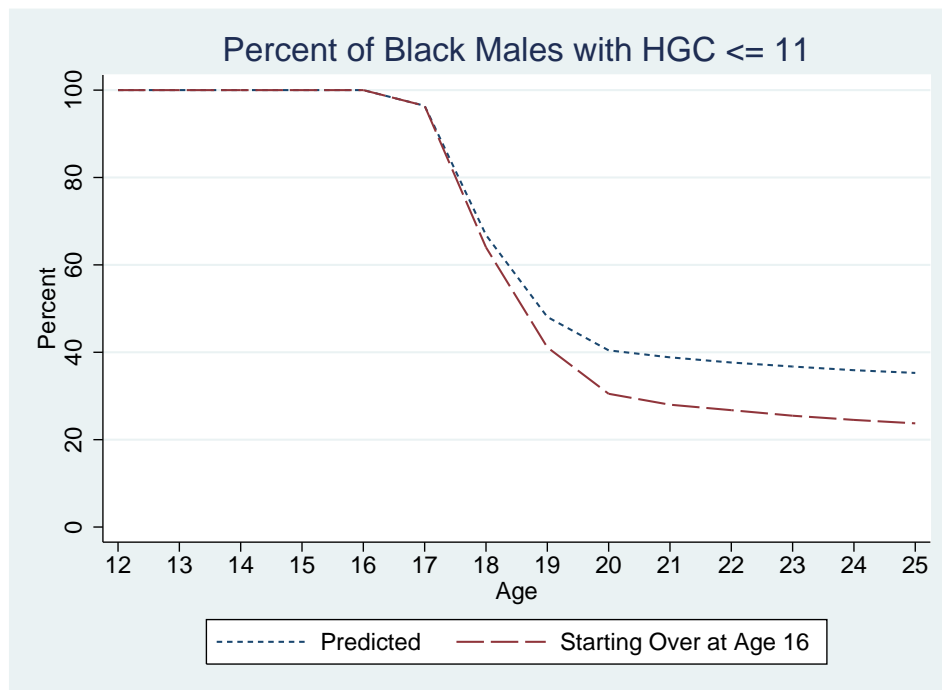


Figure 34: Counterfactual II: High School Graduates

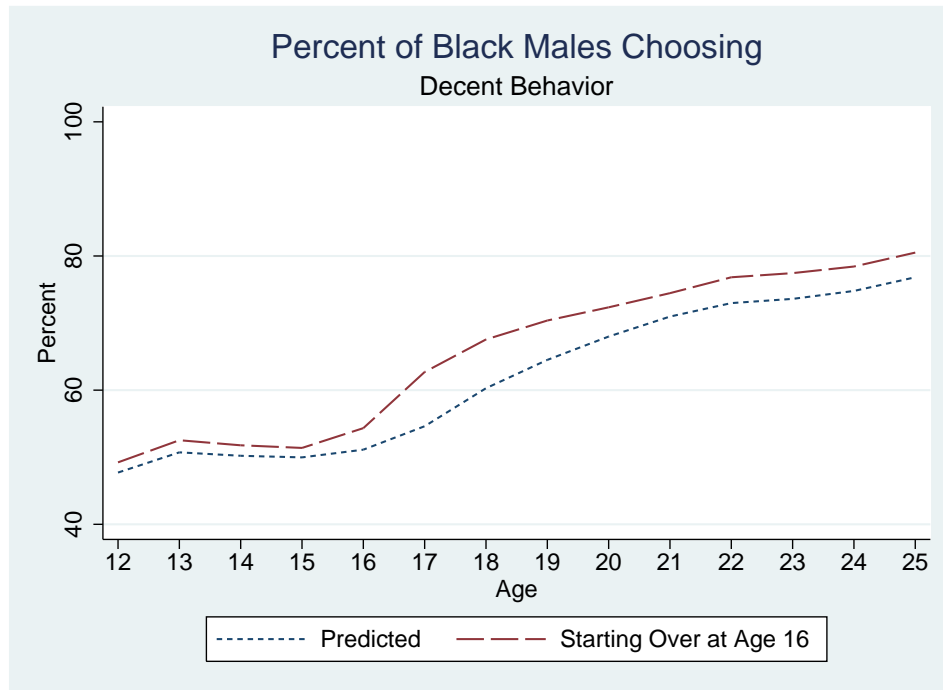


Figure 35: Counterfactual II: Decent Behavior

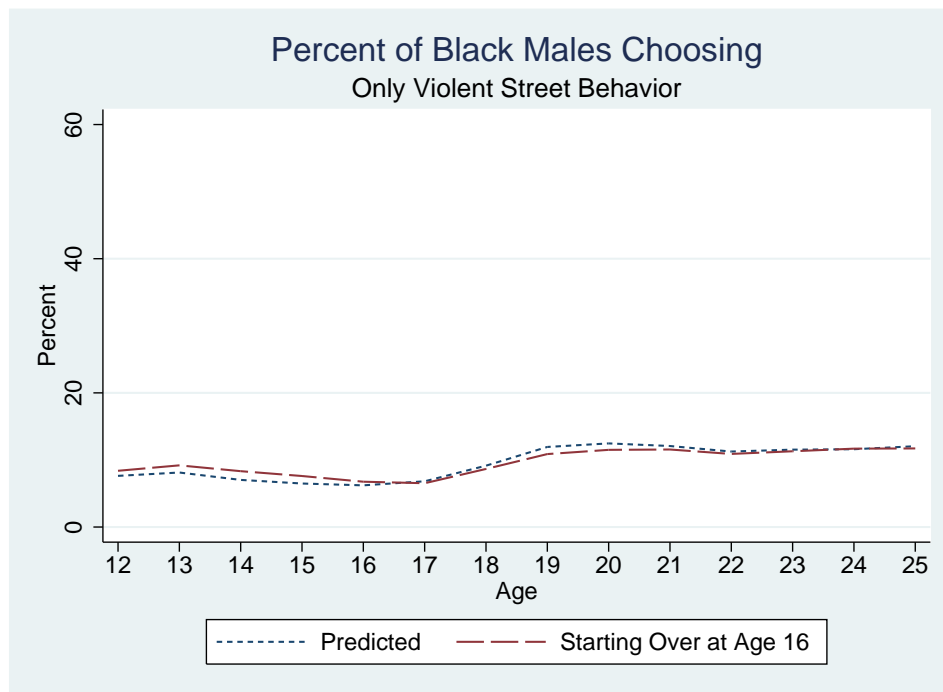


Figure 36: Counterfactual II: Violent Street Behavior

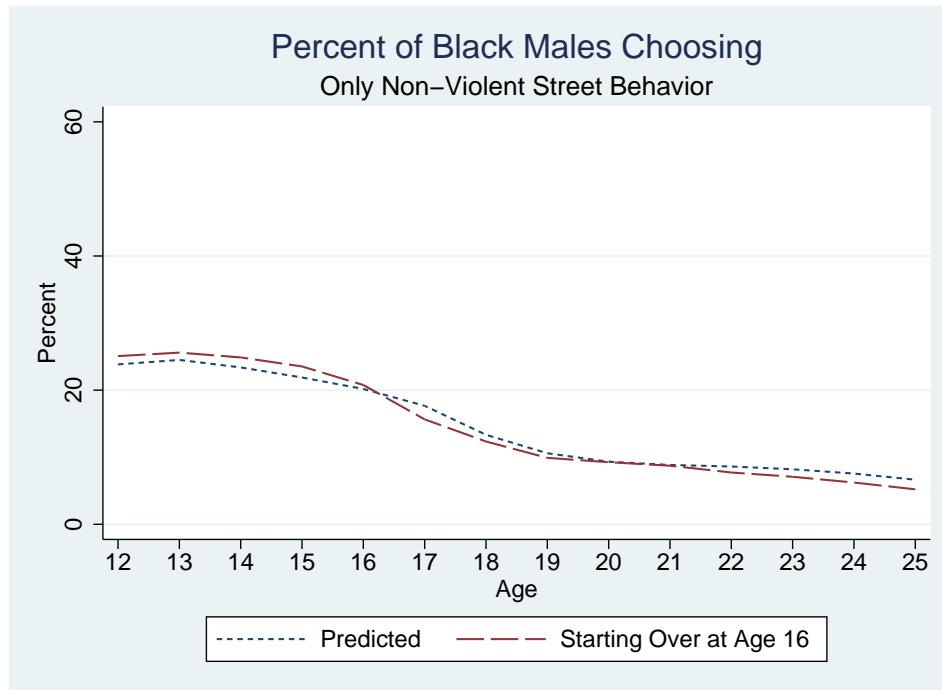


Figure 37: Counterfactual II: Non-Violent Street Behavior

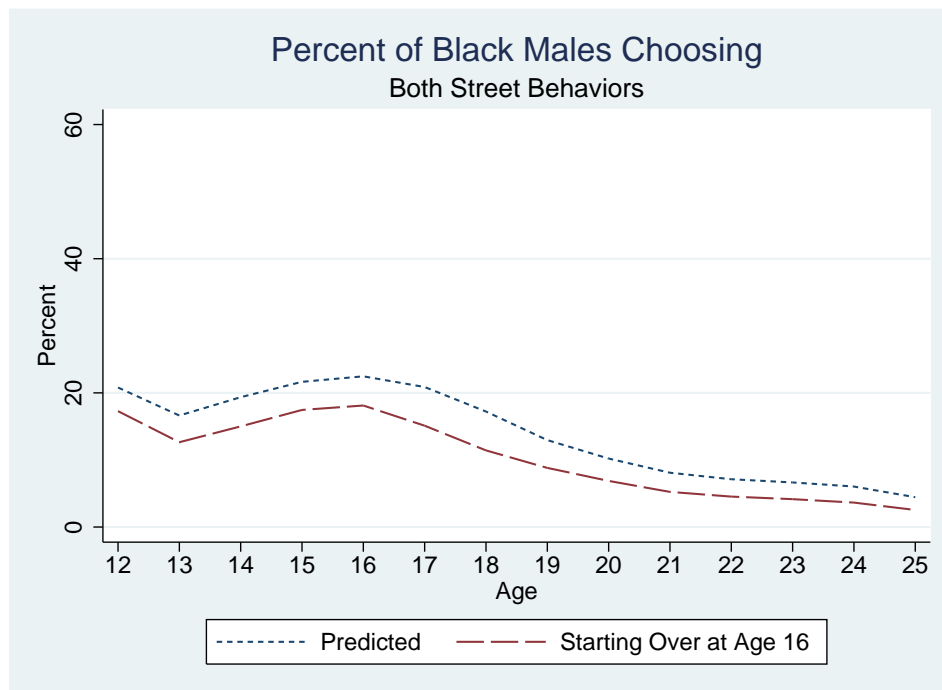


Figure 38: Counterfactual II: Both Types of Street Behavior

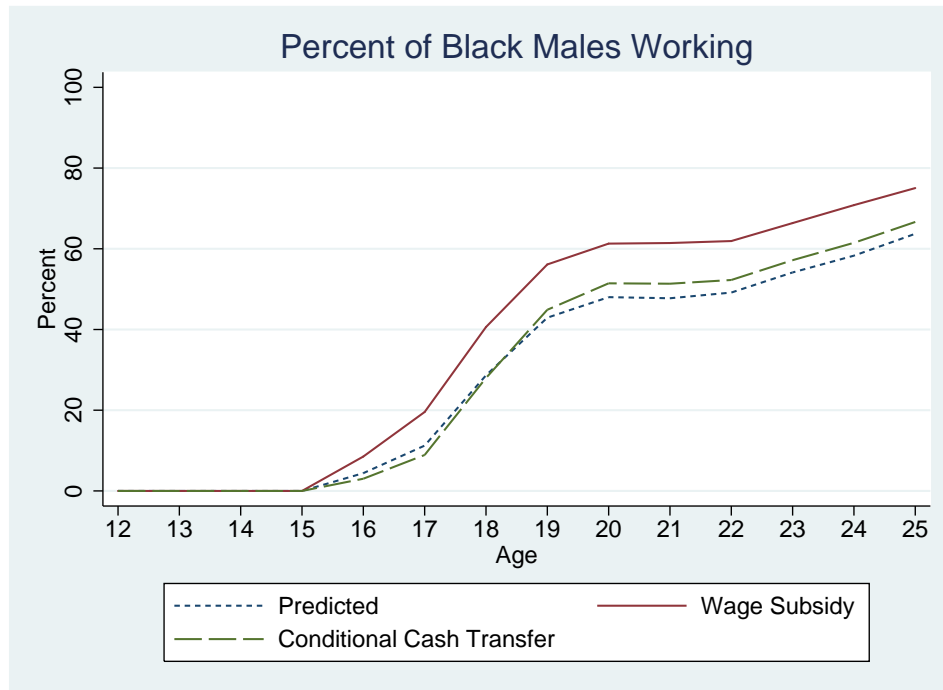


Figure 39: Counterfactual III and IV: Work

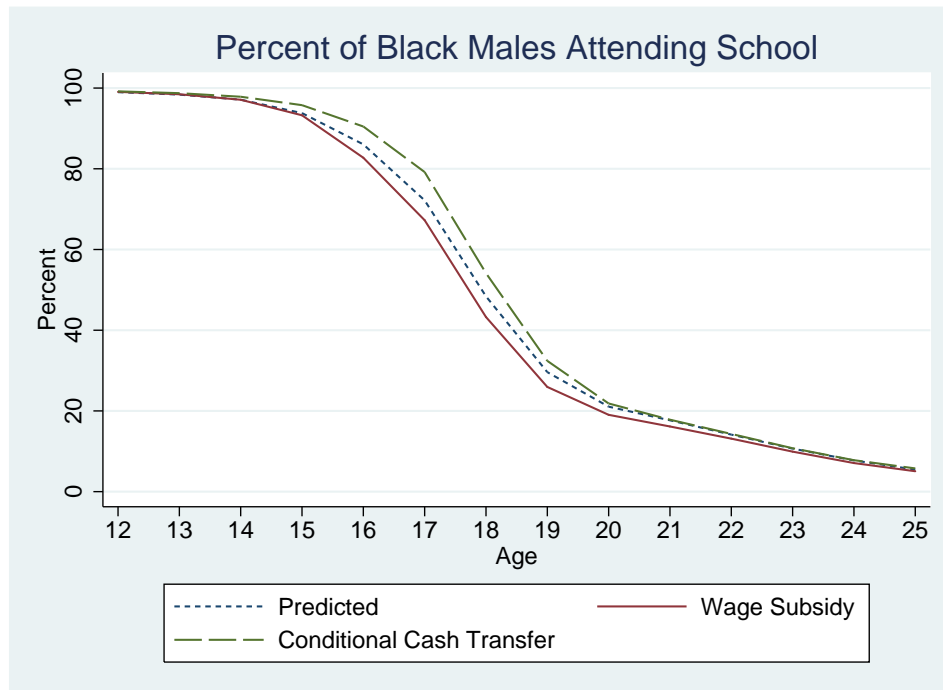


Figure 40: Counterfactual III and IV: School

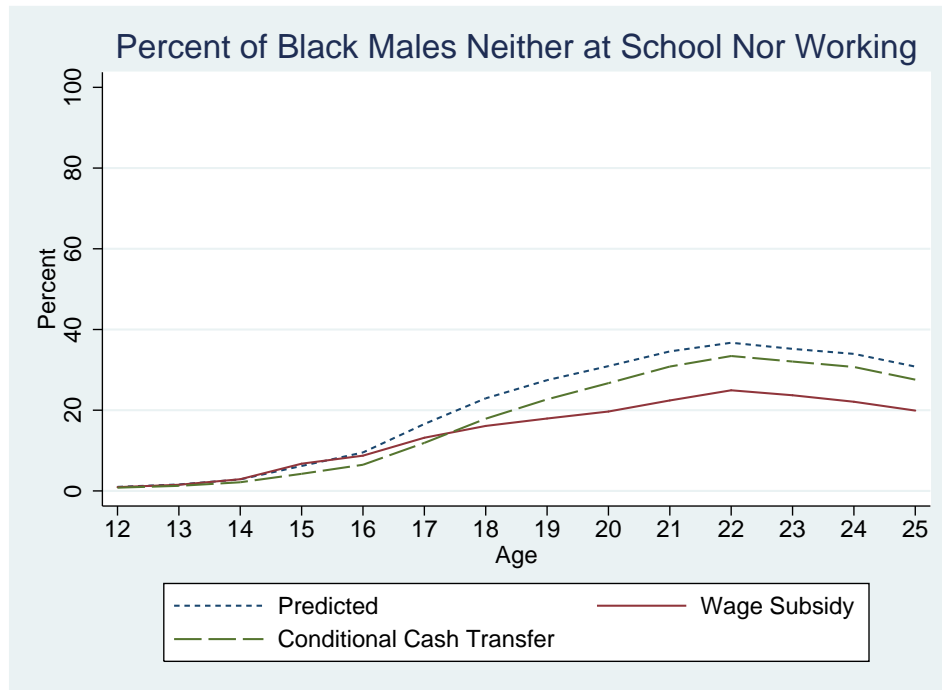


Figure 41: Counterfactual III and IV: Neither Work Nor School

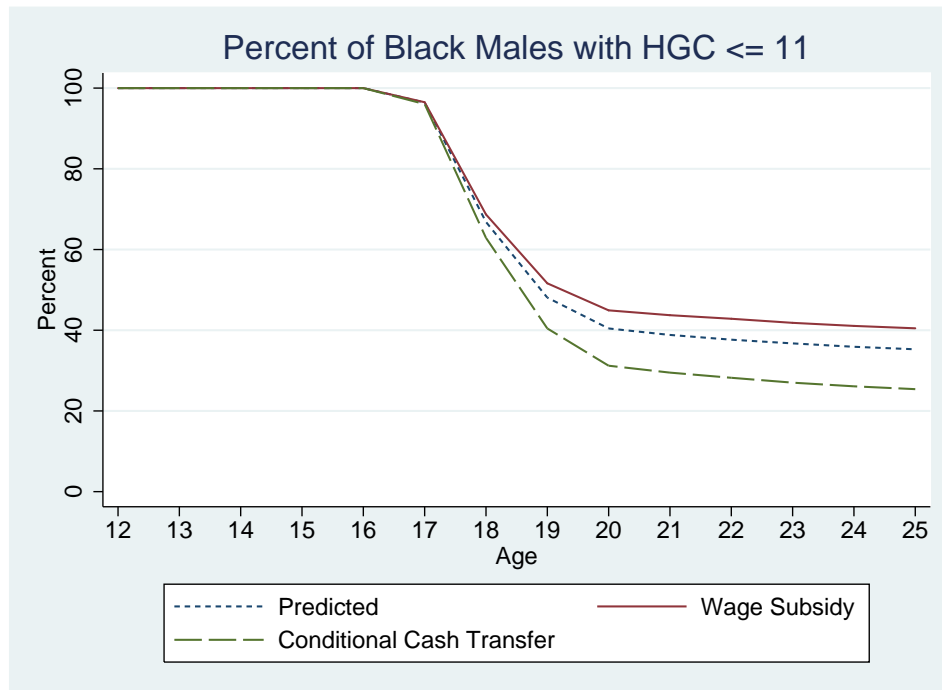


Figure 42: Counterfactual III and IV: High School Graduates

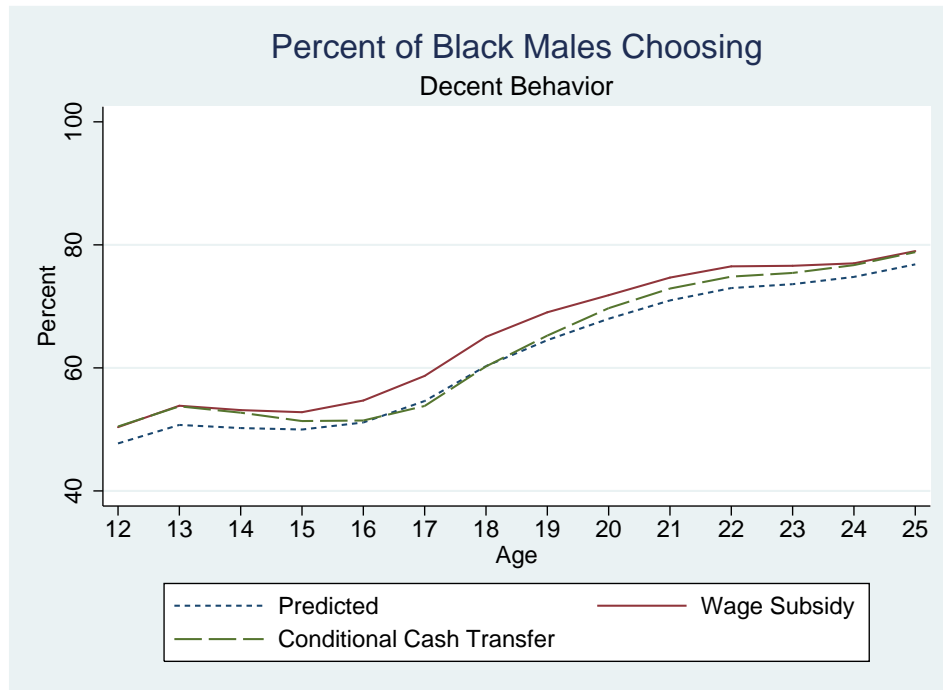


Figure 43: Counterfactual III and IV: Decent Behavior

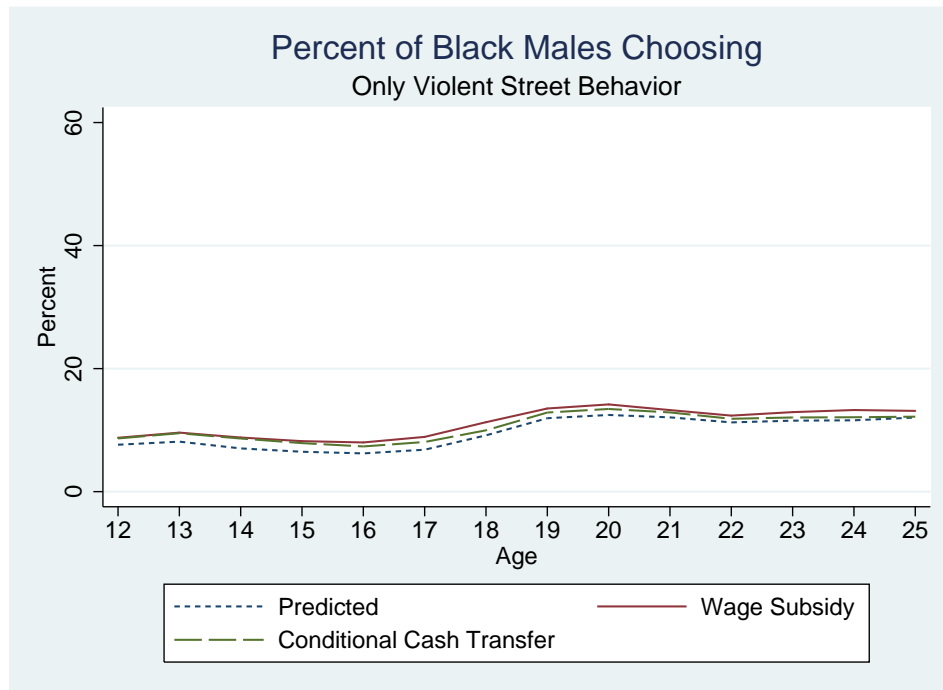


Figure 44: Counterfactual III and IV: Violent Street Behavior

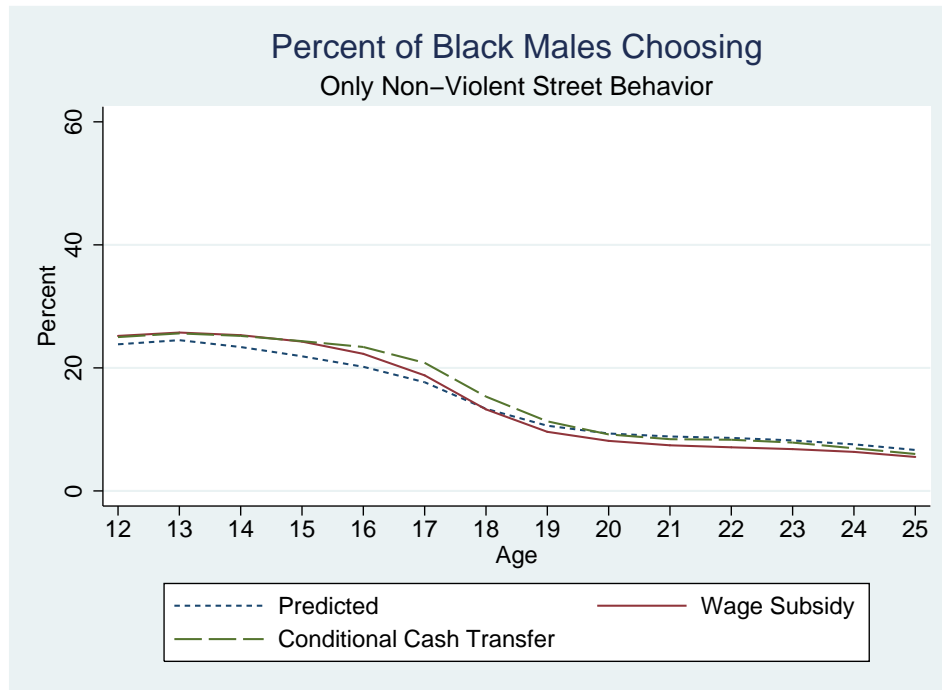


Figure 45: Counterfactual III and IV: Non-Violent Street Behavior

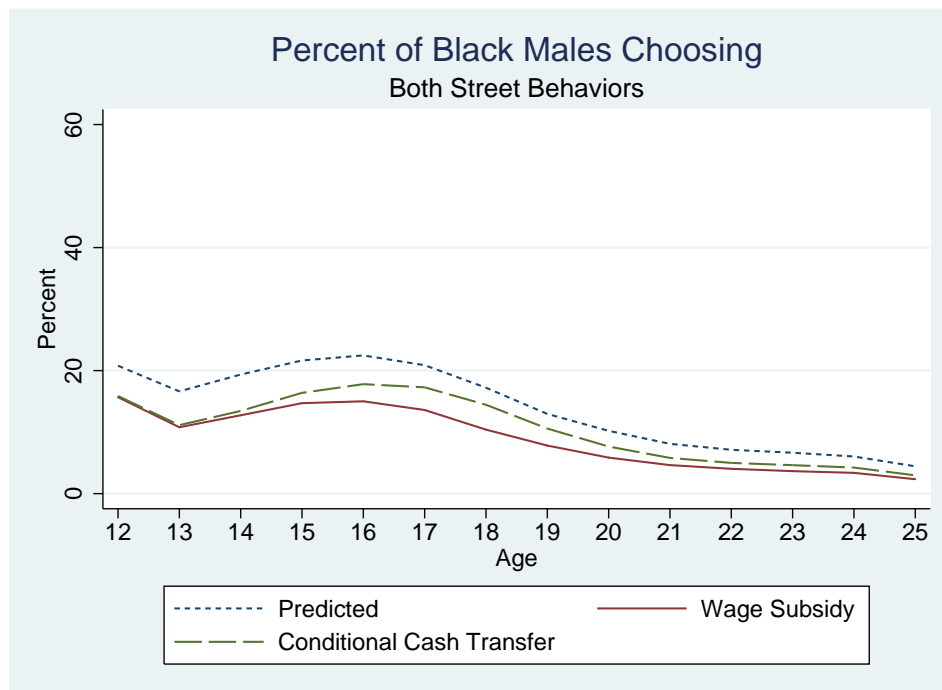


Figure 46: Counterfactual III and IV: Both Types of Street Behavior