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Relationships Within the Family Tree: Roots of Recidivism

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Claremont McKenna College

Relationships Within the Family Tree: Roots of Recidivism

submitted to

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and

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by

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for

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Abstract

This paper seeks to examine the correlation between family relations and habitual criminal activity. Building on previous research analyzing the power and influence of positive family environments on criminal behavior, I studied the effect of parent-child relationships as determinants of adult recidivism. My results corresponded with previous studies and implied a direct correlation between positive relationships and recidivism reduction. Furthermore, my findings support the research illustrating the effect of a person's family criminal history, level of education, and socioeconomic status on criminal behavior, which may ultimately have an effect on these influential ties between parents and children.

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I. Introduction

The United States has incarcerated roughly 2.3 million people since the mid-1950s, increasing the prison population by almost eight fold. (Fellner, Parker, and McFarland 2014). This drastic increase and overcrowding of American prisons is largely a result of our country's commitment to strengthening the criminal justice system and instituting a "tough on crime" initiative (Fellner, Parker, and McFarland 2014). Included but not limited to these policies were the implementation of mandatory minimum sentences, increased lengths of sentences for various crimes, three-strike policy, and increasing punishments for drug offenses (Fellner, Parker, and McFarland 2014). Figure 1¹ graphically depicts this alarming increase in incarceration rates across the United States post 1960 and illustrates the impact the "tough on crime" legislation has had on the prison population.

Recidivism is a prominent contemporary issue plaguing the criminal justice system in America and is a significant contributor to the mass incarceration problem the U.S. is facing. According to the National Institute of Justice, recidivism is defined as a "person's relapse into criminal behavior, often after the person receives sanctions or undergoes intervention for a previous crime" (National Institute of Justice 2014), and is measured by "criminal acts that resulted in rearrests, reconviction, or returns to prison with or without sentencing during a three-year period following the prisoner's release" (National Institute of Justice 2014). In 2014, a study was conducted to better understand the magnitude of this issue. It was reported that of the 404,638 state prisoners released in

¹ This graph, along with all other subsequent graphs and tables are listed under the "Tables and Graphs" section of this paper starting on page 30

2005, across 30 states, 67.8% of the prisoners were re-arrested within the three years following their release, and 76.6% of were re-arrested within 5 years of release (Durose, Cooper, and Snyder 2014). Furthermore, of these sampled released prisoners re-arrested within their first 5 years of release, 84.1% were age 24 or younger, (Durose, Cooper, and Snyder 2014). Overall, 16% of the total released prisoners represented the 48.4% of the 1.2 million arrests that took place during the 5 years post release period (Durose, Cooper, and Snyder 2014). Figure 2 illustrates recidivism in relation to time measured in years post release.

Recidivism rates continue to remain high despite endless increases in funding for state prisons. According to the Bureau of Justice Statistics, states have increased their state correctional funding from \$15 billion in 1982, to \$53.5 billion in total spending in 2010 (Kychelhahn 2014). In 2014, the U.S Department of Justice requested for an increase of \$236.2 million dollars to ensure the maintenance of secure prisons and detention facilities and to invest in programs aimed at reducing recidivism (U.S Department of Justice). Overall, a significant amount of this federal and state funding is delegated for funding rehabilitation programs for the convicted, probation and parole programs, and nonresidential halfway houses (Kychelhahn 2014) whose purpose is to prepare criminals for re-integration into society post release (Families Against Mandatory Minimums 2013). Despite the funding and programs aimed at preventing ex-prisoners from recidivating, there seems to still be little reduction in rates

Many of the state and federal programs and strategies employed have a forward-facing approach—how can the services and necessary resources be appropriately

delegated to help inmates while in prison (i.e. job training, education etc.) to prepare them for life post release and ultimately prevent them from regressing back into criminal activity. While these programs may be successful for some, high recidivism rates endure. What if the roots of recidivism rested not only in the prison experiences itself, but rather are profoundly influenced and established through adolescence and childhood. If the later has any significant effect, then the responsibility of federal and state governments should not rest solely in funding rehabilitation and reintegration programs aimed to deter prisoners from committing future crimes, but should also be focused on understanding the fundamental causes of recidivism through an analysis of all aspects of a prisoner's life.

Extensive research has been conducted to understanding one element to this question, and that is in understanding the critical role early family relationships and social ties within the family may play in predicting an individual's future involvement in crime, and potential continued involvement in crime post-imprisonment (Petrosino, Derzon, and Lavenberg 2009). Factors such as parental neglect, parental supervision, parental supportiveness, parental influence, abusive home environments etc., all play a part in constructing family social ties and are used in criminological studies to determine if these are possible risk factors for an individual's criminal behavior (Petrosino, Derzon, and Lavenberg 2009). The often hypothesized theory states that individuals coming from supportive and enriching homes, characterized by positive and loving familial relationships, stable living environments, and regard (etc.), are less likely to pursue a life of crime (Petrosino, Derzon, and Lavenberg 2009). In contrast, if a child is brought up in a fragile home consisting of indifferent parenting styles, abusive relationships, and

neglect, the child may it may display criminal tendencies (Petrosino, Derzon, and Lavenberg 2009).

Furthermore, three theories have dominated research in the field of criminology; the effect that strain theory, social control and bonding, and social learning may have in determining criminal behavior (Hope and Paat 2015). A version of strain theory suggests criminal activity is used as a coping mechanism for strain that may be derived from negative family relationships (Agnew 1992). Social control and bonding theories suggests that every individual has criminal propensity unless we have external influences reducing these potential tendencies (Hope and Paat 2015). The quality of personal relationships may serve as these external influences; the more durable the bond the more control over criminal tendencies (Sampson and Laub 1993 as cited in Hope and Paat 2015). Lastly, social learning plays a role in predicting criminal behavior as behavior is learned through social experiences that “vary contingent upon the association, definitions, reinforcement, and imitation of other deviant individuals” (Akers 1998 as cited in Hope and Paat 2015, 230), which may include a parent.

Numerous other economic, environmental, genetic, psychological etc. factors contribute to predicting a child’s susceptibility to crime, but, understanding the role family dynamics play in building family relationships ties is important to understand for prevention.

While the research on the relationship between family influences and recidivism may not be as common as the research on the relationship between family influences and crime in general, the family correlates are similar. If a child grows up in negative family

environment and does commit a crime, it can be assumed that this environment may also effectively increase the child's chances of committing additional crimes. The purpose of this paper is to contribute to this discussion by analyzing the role those parent-child relationships and respective social bonds play in determining an individual's propensity for recidivating.

This paper uses data from the 1997 National Longitudinal Youth Survey to understand the relationship between family factors and recidivism for individuals with premature criminal histories (defined as having been arrested for the first time by the age of 20). The analyses of healthy father-son and father-daughter relationships (i.e. having them as a supportive, involved, and influential role model figure) independent from other factors concluded that these relationships had a correlating role in reducing recidivism. However, an analysis of the effect of healthy mother-son and mother-daughter relationships (also measured as having them as a supportive, involved, and influential role model figure), on recidivism concluded that only healthy mother-son relationships appeared to have any significant effect on reducing recidivism.

In regard to these relationships effect on reducing an individual's habitual recidivating behavior, it appeared that only males benefitted from positive parental relationships. Furthermore, independently of other factors, abusive family environments and family interaction had no significant effect on reducing recidivism or habitual recidivism. When controlling for exogenous factors such as income, race, gender, family criminal histories, and parental education, family factors, on average, remained significant in reducing recidivism but somewhat less significant in reducing habitual

recidivating behavior. Abuse and family interaction remained insignificant. This can be understood that while family measurements do influence an individual's chronic relationship with crime, exogenous factors may have a greater influencing power. Furthermore, this highlights that perhaps these family factors are not so much predictor variables, but rather are, themselves, products of exogenous forces such as income, race, family criminal histories and education have, and are interrelated in their effect on crime.

II. Literature Review

Comprehensively, it can be acknowledged that recidivism is a product of both endogenous and exogenous factors. There is considerable literature analyzing these determinants including how family relationships play an evidentiary role in predicting habitual criminal activity.

A significant component of this research is dedicated to deciphering the seemingly dichotomous relationships between both endogenous and exogenous factors on recidivism (Lebel et. al 2008). Conceivably, family criminal history, social behaviorisms, age, gender, race, family factors, socioeconomic status and neighborhood environments have significant effect on recidivism (Gendreau, Little, and Goggin 1996; Kubrin and Stewart 2006; Sampson, Morenoff, and Gannon-Rowley 2002; Simpson and Elis 1995; Case and Katz 1991; Sampson and Laub 2001). These are important not only for understanding desistance to crime, but also how they are interrelated in their influence of one another and the individual characteristics related to criminal behavior (Kubrin and Stewart 2006; Sampson, Morenoff, and Gannon-Rowley 2002; Simpson and Elis 1995; Case and Katz 1991). Exogenously, disadvantaged neighborhoods with high volumes of

crime and unemployment are acknowledged as influencing criminal tendencies, while racial minorities and males are correlated with higher propensities for delinquency (Petrosino, Derzon, and Lavenberg 2009, Gendreau, Little, and Goggin 1996; Case and Katz 1991; Grunwald et. al 2010).

This study focuses on the endogenous factors of parent relationship and family social bonds and their potential role in recidivism. As previously mentioned, having quality and durable social bonds in relationships can prevent an individual from committing a crime and ultimately prevent them from regressing to a habitual life of crime to cope with the strains in their lives (Hope and Paat 2015; Agnew 1992). Family relationships are a form of social bond and can be similarly interpreted as the more salient and present these are in a person's life, the less likely crime will persist (Sampson and Laub 1993 as cited in Hope and Paat 2015). Furthermore, if social learning theory is relevant, the child with a positive influential family might learn the immorality of unlawful acts, and thus decrease their criminal tendencies (Akers 1998 as cited in Hope and Paat 2015). Certain components of family factors that contribute to the quality of family social bonds include the role that child rearing skills, discipline, family size, family supervision, and warmth (Petrosino, Derzon, Lavenberg 2009; Lebel et. al. 2008; Hope and Paat 2015, Loeber and Stouthamer-Loeber 1986; Sampson and Laub 2001). In the research of desistance to crime and recidivism, there is a consensus that age is a primary determinant, with early studies in desistance indicating that changes and processes that occur across an individual's life should be emphasized when analyzing crime. Changes and transitions include biological processes, and varying life experiences (Sampson and Laub 1992). Sampson and Laub (1992) discuss this idea in "Crime and

Deviance in the Life Course,” specifically focusing on the Age-Crime curve, or the idea that as an individual ages, there is a greater propensity for crime (Sampson and Laub 1992). They claim that in the “long-term view” adult behavior is contingent on childhood experiences (Sampson and Laub 1992), and thus stability in criminal behavior may be a product of childhood experiences (Sampson and Laub 1992), such as the effects of parental relationships.

In terms of analyzing the correlation between family factors and predictors of recidivism, extensive research has been placed on first understanding this relationship in predicting initial criminal activity. In a meta-analysis research, Rolf Loeber and Magda Stouthamer-Loeber (1986) concluded that parental factors such as supervision, involvement in a child’s life, and praise for a child do have a significant effect on a child’s probability of engaging in crime (Loeber and Stouthamer-Loeber 1986) In a discussion of the results it is noted that in the presence of multiple familial afflictions, there is a larger chance that the child will engage in criminal activity. (Loeber and Stouthamer-Loeber 1986) This may be a result of solidified social bonds. Laub, Sampson and Nagin (1998), expanded on this value of social connection through an analogy to investments. Essentially the similarities between social bonds and investments can be understood in the sense that social bonds develop over time similarly as investments develop overtime through regular installments (Laub, Sampson, and Nagin 1998). As individuals continue to invest in their relationships and intensify these bonds, the utility for engaging in criminal activities, decreases –dis-incentivizing these individuals to commit crimes because they have more to lose (Laub, Nagin and Sampson 1998) As noted previously, age has been proven to have a profound influence on determining if and

when an individual will engage in criminal behavior. Creating social bonds and “investing” in these relationships transcends across different ages and thus may play a role in the significant effect age have on crime. In this same study by Laub, Nagin and Sampson (1998), family processes were analyzed through parenting style, parent supervisions, as well as the level of attachments children felt to their parents. Evidently, these processes did influence an individual’s choice to commit crimes.

Expanding on the discussion and importance of social bonds in the predicting ones criminal propensity, various research has looked further into why these social bonds are so important, and which aspects are positively and negatively correlated to crime and furthermore recidivating to criminal behavior. Loeber and Stouthamer-Loeber (1986) as mentioned previously, analyzed specific family paradigms to examine the potential causal relationships. Notably, the neglect paradigm (family patterns where parents neglected to spend positive and quality time with children), conflict paradigm (composed of levels of punishment imposed, inability to set limits for children, lack of parental control leading to conflict between child and parent), deviant behaviors and attitudes paradigm (effect potential parental deviance has on a child) , and the disruption paradigm (measures the effect types of disruptive events such as divorce) were used to observe these potentially causal relationships (Loeber and Stouthamer-Loeber 1986). They found these paradigms to have a significantly higher influential relationship on young boys, as young boys typically have higher delinquency rates compared to young girls (Loeber and Stouthamer-Loeber 1986). Furthermore the study showed that a lack of involvement by father figures across paradigms, predicted an individual’s relationships to crime in comparisons to the mother figures roles (Loeber and Stouthamer-Loeber 1986).

Another important element of influential family models towards predicting a child's involvement with crime is understand how family members may serve as role models for youth. One study done by Case and Katz (1991), found that children with family members in jail were more likely to be involved in crime and children living in homes with substance abuse are more likely to display similar tendencies when older (Case and Katz 1991). This research seems to suggest a potential causality—parents setting a poor example for their children, influences them to behave in the same nature. Essentially, it seems that family backgrounds are a reasonably strong predictor of youth behaviors similar to the behavior of adults (Case and Katz 1992; Hope and Paat 2015). Similarly, in a study by Hope and Paat it showed that parental contact with the legal system can be overwhelming for families with young children, potentially triggering a series of family traumas (job status, financial strains, parental separation, and family-breakup) (Hope and Paat 2015). So although a family member may be incarcerated, it isn't necessarily the incarceration that weighs down on a family and influences a child to pursue a life of crime, but rather it is the events that may ensue after this fact—such as job loss, etc. These potential negative consequences can affect other causal variables that may influence children to engage in criminal behavior.

Much of criminological research is focused on which individuals are prone to commit crimes, but less is focused on who is prone to a life of crime. Extensive research suggests that early criminal participation increases the probability that these individuals will recidivate. This can be interpreted that those who commit crimes lose their inhibitions (Nagin and Farrington 1992) and thus are less dissuaded by criminal activity than to those that do not have a previous criminal record. This early exposure to crime

ultimately segregates these individuals from society and can create difficulty adjusting to those around them, preventing them from understanding the alternatives to crime and instead committing to a life of deviance, (Nagin and Farrington 1992). If this is the case, it is possible that endogenous factors, such as ones family environment and family attitudes, reduce this commitment and ultimately help these individuals with early criminal records understand the alternatives as a result of these fostered social bonds and ties to the family.

This study differentiates from previous studies as it looks at individuals that have been proven to have criminal tendencies, as they have been arrested already, and focuses on the factors that cause them to recidivate based on childhood experiences and parent relationships.

IV. Data

Background of Data

As mentioned previously, the data used in this paper was taken from the 1997 National Longitudinal Survey of Youth, rounds 1-16. In total, the sample is composed of 8,984 youths that as of December 31, 1996 were between 12-16 years of age. In the most recently recorded round, respondents were in their mid twenties to early thirties. Additionally, this cohort is comprised of two separate groups, a cross-sectional sample and a sample composed of minority respondents (black and hispanic individuals) to ensure the adequate representation of minority figures. The groups included in this survey also underwent a screening process to confirm their interview eligibility on the condition that they each adequately and proportionately represented different population

demographics such as socioeconomic status, race, geographic region, etc. Second rounds of screening interviews were then conducted to assess the individual's age eligibility.²

The responses for each set of interview questions were captured using a Computer-Assisted Personal Interview System under the supervision of an interviewer. The software used to administer these questions were programmed to guide interviewees through the questionnaire based on their prior responses while manually checking responses to ensure valid and plausible answers. It is important to note this manner of recording as individuals were, for the most part, answering personal questions in a private setting and thus potentially more inclined to answer honestly.

This survey gathered information on an individual's employment, education, household demographics, family backgrounds, childhood, dating and relationships, income, health, attitudes, and crime and substance use. Many of these variables were measured each year the survey was administered, however some were only administered in the initial and later rounds. In the subsequent years to follow the initial interviews in 1997, interviews inquired deeper into a respondent's life personalizing the questionnaires based on their previous responses. This paper uses the criminal activity recorded each year interviewed and the initial information recorded in 1997 regarding family relationships and household demographics.

For the purpose of understanding recidivism and the determinant factors of this phenomenon, it was important to look into a smaller cohort of individuals that already

² Information regarding the information about the 1997 National Longitudinal Survey of Youth such as the overview of the sample, screening process, interviewing processes, specific questions asked etc. can be found at <https://www.nlsinfo.org/content/cohorts/nlsy97>

had displayed criminal tendencies. To do this, I looked only at respondents that had had their first arrest by the time they were 20 years old. This smaller group consists of 2,198 respondents—24% of the original 8,984 sample. Of this smaller sample, 30% of respondents were black, 20.5% were Hispanic, and 49.5% were white (included in the white makeup were individuals that identified as mixed race—1% of the population) 30% of respondents were female and 70% of respondents were male.

Summary Statistics

In order to understand the correlation between parent relationships and recidivism, I created different indices aimed to capture the various components of these relationships. Table 1 presents a summary of the different relationship indices created, with the subcategories that configured the overall index variable listed beneath the title of the indices. Column 1 presents the breakdown of the variables used, column two depicts the average values for each, and column 3 lists the standard deviations for each variable.

Five different measures were included in measuring family relationships and family factors; family interaction, supportiveness of parents, parental involvement, parental abuse, and parental role model.³

The family interaction index captured how often a respondent's family spent time together—a way of social bonding. This was measured by how many days a week a family ate dinner together, performed housework together, and enjoyed one another's company. These sub-variables were added together to create a "Family Interaction Index" which ranged from 0-21; 0 meaning the families failed to interact entirely and 21

³ It should be noted that each of these measurements are subjective in nature and reflect an individual's feelings towards their family and parents at that specific moment in time.

meaning the families devoted time every day of the week sharing meals together, cleaning the house, and enjoying each other's company. On average, families scored a 12.87 indicating they spent a relative amount of time together.

The parent role model index was included as the previous research shows a correlation between parent role models and recidivism (Case and Katz 1991). Furthermore, social learning theories suggest that having positive influences can reduce criminal propensity (Akers 1998 as cited in Hope and Paat 2015). If children saw their parents as positive role models, they may learn that criminal behavior has negative consequences and thus refrain. The parent role model index measured how influential the respondent viewed their respective mother or father and was composed of how highly a respondent thought of their mother or father, if they wanted to be like their mother or father, and if they enjoyed spending time with their mother or father. Each of these sub-variables were recorded on a metric of 0-4, 0 indicating negative feelings towards their parents and 4 indicating positive attitudes. I then created binary variables for each of; 1= a response of 3 or 4. I then interacted each of these to create a role model index ranging from 0-3; 0 indicating the respondent did not view their mother or father as a positive influence and 3 indicating the respondent felt their mother or father had a profound influence on their life. Overall, respondents viewed their mothers as somewhat of a role model figure (1.19 out of 3) with the average respondent seemingly lacking a fatherly role—averaging .772 out of 3. Only 24% of respondents felt their mother was an influential role model (noted as 3 out of 3) and even less felt they had a sound father figure role model—17% Comparatively, of the greater population of youths in the US

(the original 8,984 individuals interviewed), 30% of respondents noted having a powerful mother as a role model, while 23% looked up to their fathers completely.

The supportive family index captured how supportive a respondent's parent's attitude was towards their development. This was measured separately for the mother and father and was composed of how supportive the respondent felt their parent was—did they receive praise for their accomplishments, were they encouraged to pursue their goals, how often were they criticized for their ideas, and how supported they felt overall. Each of these sub-measurements were originally answered on a scale from 0-4, 0 meaning they did not feel supported in these areas and 4 meaning they felt incredibly supported. I created binary variables for each subcategory, 1=positive feelings of support from the mother or father (noted as answering a 3 or 4 for each of the questions). For the criticism measurement it was inversed, 1=respondent did not feel his or her parent's criticized their ideas (noted as answering 0 or 1 on this question). I then interacted these 4 binary variables to create a supportive index variable ranging on a scale from 0-4, 0 indicating a renounced home environment and a 4 indicating an encouraging home environment. Evidently, on average respondents viewed their parents as having similar influences on their lives—ranking 1.83 and 1.29 (out of 3) respectively. Similarly, the entirety of the youth population in the U.S. reported feeling some support from their mother and father figures—1.3 and 1.5 respectively.

A parent involvement index was also included to measure how present a parent was in a respondent's life. This was composed through levels of communication with respondent's friends and parents of these friends, supervision of respondent's after school

activities and whereabouts, and involvement in the respondent's education. Similarly to the previous family variables, these were all measured on a scale from 0-4, 0 indicating a lack of involvement and 4 indicating incredibly present parents. I created binary variables for these as well, setting 1=to any response with the value of 3 or 4. I interacted each of these to create the father and mother involvement indices each ranging on a scale from 0-5, 0 indicating parental neglect and 5 indicating an involved and present mother or father figure. Seemingly, individuals felt their mothers were more involved in comparison to their fathers, which aligned with the overall original sampled population—1.19 mother and .848 father compared to 1.52 mother and .716 father (all out of 4).

Lastly, the abuse index was created by measuring how respondents were treated when they misbehaved. These questions ranged on a scale from 1-7, 1 indicating that parents calmly discussed the issue with the child and 7 indicating the use of physical punishment.⁴I also created binary variables for each of these questions with 1= physical abuse, or any response equaling 7. I then interacted each of these binary variables to create an abuse index, with 1 meaning they had experienced abuse. While the average abuse was noted as .022, of the entire sample 8% of the individual's experienced parental abuse at least once, in comparison to the .08% of individuals that experienced abuse at least once for the control population.

Overall, the respondents in this sample appear to have relatively interactive relationships with their families. However, when looking at different aspects of parental relationships, comprehensively these relationships are weaker. The mother relationships

⁴ Responses for 2-6 are as follows. 2: indifferent reaction 3: silent treatment 4: take away of a privilege or grounding 5: empty threats 6: screaming, yelling, and shouting

do appear to be slightly incrementally stronger than that of the fathers, but not by substantial amounts. Additionally, abuse does seem prevalent in the average home, relative to the overall youth population.

In order to analyze the effects of family relationships on recidivism rates, it was important to control for historically causal factors such as race, gender, family criminal history, education, and household income, these are included in the Table 1 as well. Family criminal history is a binary variable with 1=the respondent has a family member that has been incarcerated in the past or was currently incarcerated at the time of the interview. Education was measured by highest grade completed by the respondent's parents measured on a scale from 0-7—0=no schooling, 1=1st-8th grade, 2=9th-11th grade, 3=12th grade, 4=some college, 5=college degree, 6=some grad school, and 7=graduate or professional degree. Household income was measured as overall gross household income in 1997.

8.7% of the population had incarcerated relatives compared to .07% of the entire youth population. On average both mother and father completed some high school (2 indicated some high school) and combined, on average the parents completed high school (3 indicated completion of high school). Contrastingly, combined parents from the overall youth population, on average, had a college degree. This is important to note that the overall sample was less educated with some parents struggling to complete high school. Additionally, the average income for the sample was \$38,404.85, with about 20% of families living at or below the poverty line in 1997, compared to the overall population average of \$46,392.49 with about 17% living at or below the poverty line in 1997.

Ostensibly, the families represented in this sample are less educated and are less affluent than the larger population, which may ultimately play a larger role in predicting which individuals will recidivate. Furthermore, it is important to consider the population's overall potential higher propensity to crime, as they have already been arrested by the time they were 20 years old. If it is true that child delinquency is correlated with adult criminal behavior (Sampson and Laub 1992), this may have a profound influence on predicting recidivism.

Additionally, it is important to note that for the purpose of this paper I use the term mother figure and father figure for mother and father relationships. While the survey did ask respondents to define the relationship they had with their parent figures i.e. whether it was their biological parent, foster parent, another relative etc., I did not incorporate these relationship clarifications. Family composition can be complicated and incredibly varied and I did not want to alter the results. Furthermore, because I was looking solely at the relationships between a parent and their child I did not include other household dynamic factors such as households with single parents. While these are important, I refrained from using them because I wanted to learn more about the relationship aspects themselves between parents and their children—regardless of their living situations. It should be noted however that 59.8% lived with both of their parents, compared to the overall 68.76% of individuals that lived with both parents.

III. Methodology

In examining my data, I first employed bivariate linear regression analyses to examine the role that family relationships have in predicting recidivism. I then ran these

same bivariate linear regressions on a different recidivism measurement: habitual recidivism. For the purpose of this study, recidivism is defined as any re-arrest an individual experienced, while habitual recidivism, denoted as “serial recidivism,” is measured as greater than the average arrest record for the sample, i.e. anything above or equal to 5 arrests. Including a habitual recidivism output variable was important for increasing robustness as it corrected for any errors in re-arrest measurements—arrests can occur for a variety of reasons, thus one re-arrest should not automatically define an individual as a chronic criminal offender. The habitual recidivism variable corrected for these discrepancies and more adequately isolated the backgrounds of those that are prone to recidivate. Furthermore, the family indices were separated from one another in the different bivariate analyses to avoid collinearity as many of the relationships questions measured similar and possibly conflicting attitudes. The two bivariate equations are listed below.

$$recidivism_i = \alpha + \beta_j familyfactors_i + u_i$$

$$serialrecidivism_i = \alpha + \beta_j familyfactors_i + u_i$$

While these simple regression analyses do provide insight into the relationships between family relations and recidivism, other exogenous factors play a critical role in determining recidivism. Therefore, I conducted various multivariate linear regressions to further examine the role these family indices played in predicting recidivism rates, when controlling for other statistically proven recidivating determinants such as race, income, family education, and family criminal history. These regressions present a more robust

depiction of the effect that family relationships have on recidivism. The equations for these analyses are listed below.

$$\text{recidivism}_i = \alpha + \beta_1 \text{familyfactors}_i + \beta_2 \text{income}_i + \beta_3 \text{race}_i + \beta_4 \text{familycriminalhistory}_i + \beta_5 \text{familyeducation}_i + u_i$$

$$\text{serialrecidivism}_i = \alpha + \beta_1 \text{familyfactors}_i + \beta_2 \text{income}_i + \beta_3 \text{race}_i + \beta_4 \text{familycriminalhistory}_i + \beta_5 \text{familyeducation}_i + u_i$$

V. Empirical Results

In this section I present the main results of the different regression analyses in order of parental relationship measurements.

Recidivism Percentages

As noted earlier, recidivism is measured through re-arrests, re-convictions, and returns to prison (National Institute of Justice 2014). For the purpose of this study, recidivism was measured solely in the form of re-arrests. While incarceration rates were also measured in the 1997 National Longitudinal Study of Youth, a significantly smaller proportion of individuals were incarcerated which, if used, may have led to an inadequate analysis due to small sample size. However, from these individuals in this smaller cohort (individuals that have been arrested by the time they were 20), 25.4% were incarcerated. From this, 13.6% of the overall sample had been incarcerated more than once. In terms of arrest record, the overall recidivism rate for the entirety of the sample was 67%. Figure 3 graphically depicts recidivism rates across demographic breakdowns.

Evidently, not only did a significant portion of the population recidivate once, but an even larger percentage of the individuals surveyed, recidivated more than once.

Respondents across the demographic breakdowns averaged about 20% for recidivating

just once while averaging about 44.2% for recidivating multiple times. Overall, black individuals recidivated in total 70.7%, hispanic individuals recidivated 70%, and white individuals recidivated 64.3%. It is apparent that recidivating just once isn't the only issue, but rather habitual recidivism also is a significant concern and not just for one population of individuals but across the spectrum of identities.

Race, Gender, Income, Family Criminal History, and Family Education

When independently analyzed, race —defined as being a minority figure—had a significant effect in increasing recidivism by about 6% and 5% for serial recidivism. However, when being controlled for in the multivariate regressions, race universally did not play a part in reducing recidivism. Of this sample, almost 3/4ths of respondents were re-arrested across all racial demographics (70% of black individual's recidivated, 64% of whites' recidivated, and 70% of hispanic respondents recidivated). Because the percentages for recidivating were close in value across the different racial demographics, being a minority in this sample had relatively no effect. In regards to gender, across all the regression analyses employed, being a female significantly reduced the propensity for recidivism and serial recidivism by almost 24% and 14% respectfully. While this is a large percentage, this is most likely the result of a small proportion of females included in the sample. Refer to Table 2, Row1, Column 2-3 for regressions results for Gender, and refer to Table 2, Row 3, Column 2-3 for independent regression results for Race

For the purpose of the regression analysis, the log of income was used to account for any potential outliers that may skew the data as the income of the populations fell across a broad spectrum ranging from 0\$ to \$246,474. In both the bivariate regression for

income and when controlling for income in the different multivariate regressions, income remained significant in reducing recidivism and serial recidivism from about .03 to almost .04 percentage points consistently. This can be interpreted, as any 1% increase in an individual's income, recidivism and serial recidivism will decline by almost .04 percentage points. Although these numbers may seem low, when compared to a base of 67% of recidivating individuals, this is a significant reduction. Refer to Table 2, Row 5, Columns 2-3 for independent regression results for Income.

Having a family member that was currently or had previously been incarcerated had a profound effect on increasing the recidivism and serial recidivism by almost 20% consistently throughout the bivariate and multivariate regressions. This is not surprising—having an incarcerated family member not only interrupts family processes and disrupts family dynamics but also has other extenuating consequences. Incarceration can take parents out of the home, which can have long-lasting damages on parent and child relationships. Furthermore, incarceration hurts an individual's employment opportunities and ultimately can hurt a family financially. Additionally, when a potential role model is sent to prison this sets a certain precedent for younger children that can ultimately affect their concept of crime and its respective consequences in their adulthood. Refer to Table 2, Row 7, Columns 2-3 for independent regressions results for Family Criminal History.

When independently analyzed, the parents' education level has a significant effect in reducing both recidivism and serial recidivism—a 1 point increase in education level resulted in a reduction of 2.8% and 1.9% respectively. This can be understood, that

parents who are highly educated will encourage their children to stay and do well in school which has a significant effect in reducing crime. Furthermore, parents who are well educated typically will have higher incomes than those who are less educated and thus be able to provide for their children in ways that may help prevent criminal activity. Refer to Table 2, Row 9, Columns 2-3, for the independent regression results for parent education.

Family Interaction

Independently and when controlling for exogenous factors, the amount of time spent interacting with one's family had no significant effect on recidivism or serial recidivism. While family interaction definitely has value in developing social bonds and instilling a sense of family values, the measurements used for this specific index were narrow and may have not adequately represented family social bonds. The index only included how often a family ate dinner together, did housework with one another, and had fun with one another. Furthermore, because family composition was not taken into account and may have affected family interaction, the variable makeup could be weak. Refer to Table 3 for the regression results for family interactions effect on recidivism.

Influential Role Models

The bivariate regressions for males and females reveal that the influence of a positive father figure has a profound effect (at the 5% and 1% significance levels) in reducing recidivism and serial recidivism—a one point increase in the index, reduced recidivism between roughly 2-4%. When controlling for other explanatory factors, having a strong father role model remained significantly effective in reducing recidivism and

serial recidivism—2.8% (at the 1% significance level) and 2.3% (at the 5% significance level) respectively. The bivariate regressions revealed that having a powerful mother figure as a role model did have significant effect for males in reducing recidivism (1.7% at the 5% significance level), but did not have any effect for serial recidivism nor for reducing recidivism for females. When controlling for other figures, having a supportive mother figure for a role model reduced recidivism by 1.8% (at the 10% significance lever) and reduces potential serial recidivism by 1.9% (at the 5% significance level). Refer to Table 4 for the effect parent role models have on recidivism.

Supportive Parents

Similarly to the role model influence effect, the bivariate and multivariate regressions show a significant relationship (at the 1% and 5% significant levels), between supportive mother and father figures for both recidivism and serial recidivism, from a 2% to almost 4% reduction. However, when analyzing the effects of the supportive mother and father figures between genders, it appears that having a supportive mother figure had no effect on reducing recidivism or serial recidivism for females, but did for males. Having a supportive mother or father figures provides for a safe environment for children and also a serves as the foundation of support for these individuals post release from their first arrest—which may ultimately play a crucial role in reducing their chances from being re-arrested. Refer to table 5 for the regression results for the supportive parent indices.

Parental Supervision and Involvement

Again, like both the parental supportive and role model indices, there appears to be significant relationships between involved mother figures (reduction by about 2% for males), and present father figures (about 1-2% reduction for both males and females) in reducing recidivism. In terms of reducing habitual recidivism, having a supportive mother and or father had relatively no effect.⁵ Furthermore, having an involved mother figure was only significant in reducing recidivism by about 2% for males, and had no effect on females and similarly had no effect when controlling for other variables. With males, having a present father figure reduced the potential for recidivism by 2.3% and with females with an involved father figure by 1.3%. Refer to Table 6 for the regression results of parental supervision indices on recidivism.

Abusive Parental Relationships

Unlike other family relationships measurements, abusive parental relationships did not have a significant effect in reducing recidivism or chronic recidivism among respondents. While literature and previous studies suggest a correlation between violence and abuse in childhood and crime (Sampson and Laub 2001), this may have not been accurately represented through the questions I used from 1997 NLYS survey. For this study, abuse was measured solely by how a respondent's parents resolved issues when they misbehaved and used the term "physical punishment" broadly without specifying exactly what this entailed—potentially affecting responses and ultimately skewing the data. Furthermore, only a small percentage of individuals recorded being punished, and

⁵ Having a positive mother figure did reduce serial recidivism for males by 2% at the 5% significance level

therefore may have lacked influence due to small sample size. Refer to Table 7 for the effect of abusive relationships on recidivism.

VI. Discussion and Limitations to the Study

Discussion of Results

Overall I found there to be a significant correlation between parents as positive role models, supportive parents, and parents that are involved with their children's lives with reducing recidivism. After controlling for race, income, family criminal history, and family education levels, these measurements remained, on average, significant. This may indicate some causality between recidivism and family environments and suggests that these family relationships may not just be products of other predicting factors such as income and level of education, but are themselves independently influencing.

Specifically, I found the relationships between father and sons and mother and sons to have a more profound effect compared to these same relationships with daughters.

Studies report that parent and family ties differentially affect male and females (Hill and Atkinson 1988). Furthermore, research has shown that while females have stronger connections with their mother figures, the effect of similarly strong relationships between males and their father figures, comparatively, have a more profound effect in reducing crime (Simpson and Ellis 1995; Petrosino, Derzon, and Lavenberg 2009).

Limitations

There are a variety of limitations and incongruences in this study. Firstly, the sample is composed of individuals that already have committed crimes, thus they already

have some propensity for criminal activity that may have initially been influenced by their family relationships.

Furthermore, the sample was created to include individuals that have committed crimes by the time they were 20 years of age. While imposing this condition allowed for a larger cohort of individuals to be examined, individuals with early criminal histories often times have a higher propensity to continue committing crimes throughout their lives. This returns to the idea that human behavior revolves around social bonds and socialization. Individuals that are prevented from these vital connections early on—on account that they have been ostracized or isolated from society because of their criminal behavior, will be lacking in their social bonds, lose this sense of attachments or source of deterrents to crime and thus continue to habitually pursue crime.

Additionally, the factors in the different family indices factors are subjective in nature and potentially biased. These responses could be skewed in a variety of different ways—how they were feeling about their parents on that specific day may be different to how they feel on an overall basis, if they were in a rush to complete the questionnaire quickly they have may have gone through the questions hastily, without taking the time to consider their best answer etc. Essentially all of these measurements are subject to human error and therefore not as sound or legitimate as needed to understand the true impact these aspects have on recidivism.

Another setback to the data is the fact that the family measurements included in this study were only the responses from the first time respondents were interviewed and did not include the responses for these same questions from the subsequent years to

follow. The response recorded and used in this study represented the structures and relationships between children and their parents when the child was between 12 and 16 years of age. As discussed earlier, relationships transcend through the years and many of these relationships and bonds between family and child may have deteriorated or strengthened throughout the years. They were not recorded at the time of each individual's first arrest, nor were they recorded at the subsequent arrests that may have followed. Future research could delve into the importance of social bonds and familial relationships with inmates while they are currently serving time or post release. This would potentially provide a more accurate depiction of the role family plays in helping prisoners re-integrate back into society and avoid returning to prison in the future.

Another point to consider when looking at this research is that the output variables of recidivism and serial recidivism represent incredibly broad measurements. For the purpose of this study, I wanted to understand what causes an individual to recidivate and in answering this question I simplified and broadened the definition of recidivism to entail "re-arrests." This did not include re-convictions or re-incarcerations. While this still is an accurate and important aspect to research, it does not take into account how arbitrary arrests can be nor does it account for the spectrum of arrests that can occur. Arrests can entail a simple parole violation to a homicide—the data I included did not specify the terms and conditions under how these arrests took place. Furthermore, I did not control for types of crimes committed or past sentences. Criminal activity varies in severity and consequences with the backgrounds of the individuals committing these different crimes varying as well. For example, if I had only looked at recidivism in

violent crimes would the abuse index prove to be more significantly correlated? This would be something important to control for in the future.

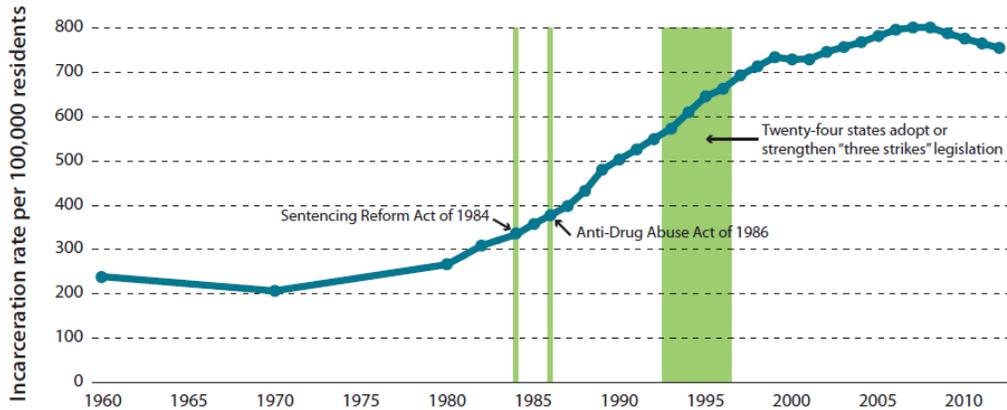
VII. Conclusion

Mass incarceration is a troubling issue impacting America's justice system, with recidivating criminals playing an integral role to this epidemic. State and federal governments are continuing to increase their spending on prison facilities and programs aimed to prevent recidivism, but it continues to exist. The roots of recidivism do not rest solely in the prison experience itself, nor do they stem solely from poor prison-re-entry reforms—there is more going on that developed years before these individuals were initially arrested. The family experiences a child has, plays a significant role in predicting criminal behavior and ultimately on an individual's decision to pursue a life of crime in adulthood. The family relationships and social bonds developed in a child's younger and adolescent years serve as deterrents to criminal activity—the more durable and sound the relationships are, the more in check a child is on their behavior (Akers 1998 as cited in Hope and Paat 2015). Similarly, family relationships have a role model effect and can teach children, by example, how to succeed in a life free of crime (Sampson and Laub 1993 as cited in Hope and Paat 2015).

Emphasizing the integral value of social relationships overall is important and should be incorporated into post-imprisonment initiatives. Perhaps, if prisons and correctional facilities incorporated post-release programs aimed at building relations and social bonds, this might help to reduce increasing returns to prison.

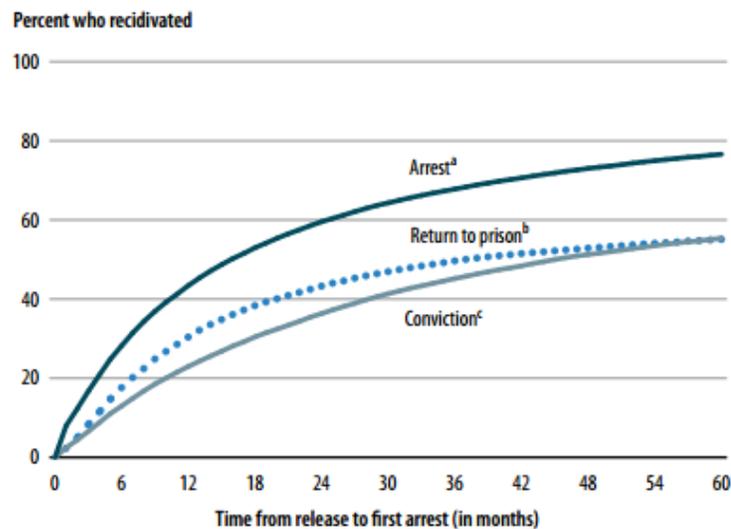
VIII. Tables and Graphs

Figure 1: Incarceration Rates in the United States, 1960-2012



(The Hamilton Project: Ten Economic Facts about Crime and Incarceration in the United States, 2014)

Figure 2: Recidivism of Prisoners in 30 states in 2005, by time from release to first arrest that led to recidivating event



Note: Prisoners were tracked for 5 years following release in 30 states. Some states were excluded from the specific measures of recidivism. See *Methodology*.

^aBased on time from release to first arrest among inmates released in 30 states.

^bBased on time from release to first arrest that led to a prison sentence or first prison admission for a technical violation without a new sentence among inmates released in 23 states.

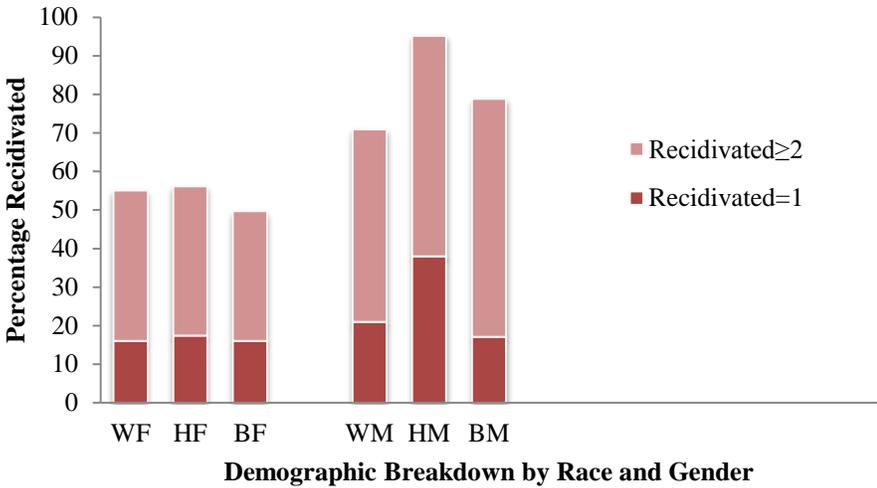
^cBased on time from release to first arrest that led to a conviction among inmates released in 29 states.

(Bureau of Justice Statistics: Recidivism of Prisoners Released in 30 States in 2005: Patterns from 2005 to 2010, 2014)

TABLE 1
SUMMARY STATISTICS FOR FAMILY RELATIONSHIP AND CONTROL VARIABLES

Variables	Mean	Standard Deviation
Family Interaction Index	12.87	4.83
Time Spent with Family Eating Dinner		
Time Spent with Family Doing Housework		
Time Spent with Family Having Fun		
Positive Role Model Parent Relationships:		
Positive Mother Relationship Index	1.19	1.25
Think Highly of Mother		
Look Up to Mother		
Enjoy Spending Time with Mother		
Positive Father Relationship Index	.772	1.19
Think Highly of Father		
Look Up to Father		
Enjoy Spending Time with Father		
Supportive Parent Relationships:		
Supportive Mother Index	1.83	1.43
Praise		
Criticism of Ideas		
Supportive of Goals		
Overall Support		
Supportive Father Index	1.29	1.49
Praise		
Criticism of Ideas		
Support of Goals		
Overall Support		
Involvement Index:		
Mother Involvement Index	1.19	1.41
Monitors Friends		
Communicate with Other Parents		
Monitor After School Activities		
Hands on Involvement with Academics		
Father Involvement Index	.848	.318
Monitors Friends		
Communicate with Other Parents		
Monitor After School Activities		
Hands on Involvement with Academics		
Abusive Index	.022	.188
Family History of Incarceration	.087	.282
Gender:		
Male	.697	.459
Female	.303	.459
Race:		
White	.484	.499
Black	.300	.458
Hispanic	.205	.404
Gross Household Income	38,404.85	36,775.25
Parent Education Background	3.31	1.41
Highest Grade Completed by Mother	2.41	1.35
Highest Grade Completed by Father	2.45	1.59

FIGURE 3: PERCENTAGE RATES OF RECIDIVISM (RE-ARRESTS) BY RACE AND GENDER



Note: Sample sizes for the demographic groups: black=660, black female=181, black male=479, white=1087, white female=354, white male=718, hispanic=451, hispanic female=124, hispanic male=327.

TABLE 2
ORDINARY LEAST SQUARES BIVARIATE REGRESSIONS OF THE EFFECT OF RACE, INCOME, EDUCATION, AND FAMILY CRIMINAL HISTORIES (CONTROL VARIABLES) ON BOTH RECIDIVISM AND SERIAL RECIDIVISM

	Recidivism	Serial Recidivism
Gender	.203*** <i>(.021)</i>	.133*** <i>(.012)</i>
Race (minority)	.059*** <i>(.020)</i>	.047*** <i>(.018)</i>
Gross Household Income (log)	-.038*** <i>(.010)</i>	-.033*** <i>(.009)</i>
Family Criminal History	.158*** <i>(.035)</i>	.159*** <i>(.032)</i>
Family Education	-.028*** <i>(.008)</i>	-.019** <i>(.007)</i>

Robust Standard Errors Italicized in Parentheses

***p<.01, **p<.05, *p<.0.1

TABLE 3
ORDINARY LEAST SQUARES REGRESSION OF THE EFFECT OF FAMILY INTERACTIONS ON BOTH RECIDIVISM AND SERIAL RECIDIVISM WHEN CONTROLLING FOR RACE, INCOME, EDUCATION AND FAMILY CRIMINAL HISTORY

	Recidivism		Serial Recidivism		Recidivism	Serial Recidivism
	Male	Female	Male	Female		
Family Interactive Index	-.024	-.015	-.002	-.002	-.002	-.001
	<i>(.032)</i>	<i>(.048)</i>	<i>(.003)</i>	<i>(.005)</i>	<i>(.003)</i>	<i>(.003)</i>
Race (minority)	-		-		.004	-.023
					<i>(-.035)</i>	.034
Gross Household Income (log)	-		-		-.042***	-.046***
					<i>(.015)</i>	<i>(.014)</i>
Gender	-		-		-.207***	-.139***
					<i>(.034)</i>	<i>(.033)</i>
Family Criminal History	-		-		.135**	.125**
					<i>(.052)</i>	<i>(.051)</i>
Family Education	-		-		-.024**	-.006
					<i>(.012)</i>	<i>(.011)</i>

Robust Standard Errors Italicized in Parentheses

***p<.01, **p<.05, *p<.10

TABLE 4
ORDINARY LEAST SQUARES REGRESSION OF THE INFLUENCE OF PARENTS AS ROLE MODELS ON BOTH RECIDIVISM AND SERIAL RECIDIVISM WHEN CONTROLLING FOR RACE, INCOME, EDUCATION, AND FAMILY CRIMINAL HISTORY

	Recidivism		Serial Recidivism		Recidivism	Serial Recidivism
	Male	Female	Male	Female		
Positive Role Model Influence						
Positive Mother Figure	-.017** <i>(.009)</i>	.011 <i>(.016)</i>	-.013 <i>(.009)</i>	-.005 <i>(.013)</i>	-.018* <i>(.009)</i>	-.019** <i>(.009)</i>
Positive Father Figure	-.029*** <i>(.091)</i>	-.038** <i>(.019)</i>	-.024** <i>(.009)</i>	-.032** <i>(.015)</i>	-.028*** <i>(.010)</i>	-.023** <i>(.009)</i>
Race (minority)	-		-		.016 <i>(.026)</i>	.008 <i>(.026)</i>
Gross Household Income (log)	-		-		-.031*** <i>(.012)</i>	-.037*** <i>(.011)</i>
Gender	-		-		-.233*** <i>(.026)</i>	-.139*** <i>(.026)</i>
Family Criminal History	-		-		.179*** <i>(.042)</i>	.153*** <i>(.009)</i>
Family Education	-		-		-.017** <i>(.124)</i>	-.009 <i>(.009)</i>

Robust Standard Errors Italicized in Parentheses,
***p<.01, **p<.05, *p<0.1

TABLE 5
ORDINARY LEAST SQUARES REGRESSION OF THE EFFECT OF SUPPORTIVE PARENT FIGURES ON BOTH RECIDIVISM AND SERIAL RECIDIVISM WHEN CONTROLLING FOR RACE, INCOME, EDUCATION, AND FAMILY CRIMINAL HISTORY

	Recidivism		Serial Recidivism		Recidivism	Serial Recidivism
	Male	Female	Male	Female		
Supportive Family Environment Index						
Supportive Mother Figure	-0.0171**	.011	-.024***	-.0135	-.016**	-.022***
	<i>(.009)</i>	<i>(.016)</i>	<i>(.008)</i>	<i>(.011)</i>	<i>(.008)</i>	<i>(.008)</i>
Supportive Father Figure	-.029***	-.037**	-.023***	-.027**	-.021***	-.023***
	<i>(.091)</i>	<i>(.019)</i>	<i>(.008)</i>	<i>(.011)</i>	<i>(.008)</i>	<i>(.008)</i>
Race (minority)	-		-		.010	.007
					<i>(.027)</i>	<i>(.026)</i>
Gross Household Income (log)	-		-		-.025**	-.036***
					<i>(.012)</i>	<i>(.011)</i>
Gender	-		-		-.238***	-.143***
					<i>(.026)</i>	<i>(.026)</i>
Family Criminal History	-		-		.179***	.149***
					<i>(.042)</i>	<i>(.041)</i>
Family Education	-		-		-.018**	-.007
					<i>(.123)</i>	<i>(.122)</i>

Robust Standard Errors Italicized in Parentheses

***p<.01, **p<.05, *p<0.1

TABLE 6
ORDINARY LEAST SQUARES REGRESSION OF THE EFFECT OF PARENTAL INVOLVEMENT FIGURES ON BOTH
RECIDIVISM AND SERIAL RECIDIVISM WHEN CONTROLLING FOR RACE, INCOME, EDUCATION, AND FAMILY CRIMINAL
HISTORY

	Recidivism		Serial Recidivism		Recidivism	Serial Recidivism
	Male	Female	Male	Female		
Parental Involvement Index						
Involved Mother Figure	-.019** <i>(.008)</i>	-.008 <i>(.014)</i>	-.020** <i>(.008)</i>	.007 <i>(.011)</i>	-.009 <i>(.008)</i>	-.011 <i>(.008)</i>
Involved Father Figure	-.023*** <i>(.008)</i>	-.013*** <i>(.015)</i>	-.011 <i>(.008)</i>	-.017 <i>(.012)</i>	-.019** <i>(.009)</i>	-.008 <i>(.008)</i>
Race (minority)	-		-		.013 <i>(.027)</i>	.005 <i>(.026)</i>
Gross Household Income (log)	-		-		-.032*** <i>(.012)</i>	-.037*** <i>(.011)</i>
Gender	-		-		-.232*** <i>(.026)</i>	-.138*** <i>(.025)</i>
Family Criminal History	-		-		.178*** <i>(.017)</i>	.152*** <i>(.042)</i>
Family Education	-		-		-.017* <i>(.008)</i>	-.008 <i>(.009)</i>

Robust Standard Errors Italicized in Parentheses
***p<.01, **p<.05, *p<0.1

TABLE 7
ORDINARY LEAST SQUARES REGRESSION OF THE INFLUENCE OF ABUSIVE RELATIONSHIPS ON BOTH RECIDIVISM AND SERIAL RECIDIVISM WHEN CONTROLLING FOR RACE, INCOME, EDUCATION, AND FAMILY CRIMINAL HISTORY

	Recidivism		Serial Recidivism		Recidivism	Serial Recidivism
	Male	Female	Male	Female		
Abusive Relationship	-0.11 <i>(.056)</i>	.036 <i>(.126)</i>	.082 <i>(.060)</i>	-.056 <i>(.102)</i>	.015 <i>(.070)</i>	.090 <i>(.070)</i>
Race (minority)	-		-		.013 <i>(.027)</i>	.005 <i>(.026)</i>
Gross Household Income (log)	-		-		-.031*** <i>(.012)</i>	-.037*** <i>(.012)</i>
Gender	-		-		-.232*** <i>(.026)</i>	-.140*** <i>(.027)</i>
Family Criminal History	-		-		.179*** <i>(.043)</i>	.150*** <i>(.042)</i>
Family Education	-		-		-.017* <i>(.009)</i>	-.009 <i>(.009)</i>

Robust Standard Errors Italicized in Parentheses

***p<.01, **p<.05, *p<0.1

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