

The Relation of Juvenile Delinquency and Adult Incarceration:

Does Parental Incarceration Matter?

A Dissertation

Presented to

The Faculty of the Curry School of Education

University of Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Of Doctor of Philosophy

By

Victoria Phillips

Charlottesville, Virginia

B.A. Yale University, 2005

M.A. Teachers College, Columbia University, 2009

M.Ed. University of Virginia, 2010

ABSTRACT

Adult criminals tend to have a history of juvenile delinquency and a family history of criminal activity. Prior to investigating these topics, measures capturing the correct information must prove reliable and valid. The Delinquency Scale on the National Longitudinal Adolescent Health Survey (Add Health) has face validity, but appears to cover a large array of delinquent behaviors. The Delinquency Scale can be divided into three factors which measure increasing severity of rule-violating behavior. These scales, Minor Transgressions, Transgressions for Personal Gain, and Violent Transgressions, have adequate reliability. Analyses demonstrated that the three factors that different types of juvenile delinquency and transgressions (Minor, For Personal Gain, and Violent) as measured by the Delinquency Scale can contribute to the prediction of adult incarceration, depending on which gender and factor is being used. The Minor Transgressions factor was not a significant predictor for either gender, whereas both Transgressions for Personal Gain and Violent Transgressions factors did significantly predict adult incarceration in different magnitudes for each gender.

Few studies have looked at a possible association between juvenile delinquency and parental incarceration and the effects of that association on adult incarceration. Some types of juvenile transgressions and a history of parental incarceration significantly contributed, independently, to the prediction of adult incarceration. The product, or interaction, of the two, however, was not significant. Parental incarceration appeared to contribute more to the prediction of adult incarceration than did juvenile delinquency. This suggests resources should be focused on the offspring of incarcerated parents in an effort to prevent juvenile delinquency or adult crimes before they occur.

Dedication

I would like to dedicate this dissertation to my sister, Caroline. Throughout my life she has served as my confidante, laughed at all of my jokes, and believed in me when I was filled with self-doubt. During these past five years, I realized just how invaluable my sister's support is and how I could not have grown personally, and thereby professionally, had it not been for her influence. Caroline provided me with strength, perspective, and confidence when I was most in need. The dedication of this dissertation is only a small token of my enormous gratitude for having her in my life.

Acknowledgements

The completion of this dissertation would not have been possible without the support and guidance of many people. I have an enormous amount of gratitude for Ann Loper, my committee chair and research advisor, who has served as a mentor, professor, champion, and inspiration throughout this process. Ann's ability to know exactly which role to play and when during my graduate career has left an indelible mark on my personal and professional development. Peter Sheras is another committee member whom I would like to thank profusely. His guidance throughout my time at Curry and support, in whichever capacity he was serving, helped me stay the course many times. I would also like to thank my other committee members: Ron Reeve, for helping guide my development in the Curry Program as a tireless leader, teacher, and advocate, and Tim Konold, who patiently led me through my first true forays into statistical analyses and always made time to answer my many questions.

My growth through my many academic programs would not have been nearly as productive or rewarding without the unwavering support and unconditional love of my family. My parents, Sharon and Barnet Phillips, encouraged my intellectual curiosity as a child, taught me that nothing worth achieving is done easily, and inspired me to leave the world a better place than I found it. I am forever grateful for their humor, warmth, and editing skills during this process. I would be remiss if I did not acknowledge how instrumental Atty has been in this process by providing me with love and companionship. Finally, I would not have survived graduate school if it were not for the camaraderie and infectious spirits of the other women in my Curry cohort, Neill Cox, Karyn Hartz-Mandell, Emily Nichols, and especially Jenna Marshall.

TABLE OF CONTENTS

	Page
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
CHAPTER	
I. STATEMENT OF THE PROBLEM	1
II. REVIEW OF THE LITERATURE	4
Theoretical foundations of delinquency	4
Effects of incarceration on children	6
Juvenile delinquency and adult offending	12
Measuring delinquency	16
Summary and present study	21
III. METHODOLOGY	23
National Longitudinal Study of Adolescent Health	23
Procedures	23
Participants	24
Measures	25
Data analyses	28
IV. RESULTS	32
Objective 1:	32
Confirmatory factor analysis (CFA)	

	of a 3-factor model of the Delinquency Scale	
	Objective 2:	36
	Relation between juvenile delinquency and adult incarceration	
	Objective 3:	39
	Moderating effect of parental incarceration on the relation between juvenile delinquency and adult incarceration	
V.	DISCUSSION	42
	Factor analysis of the Delinquency Scale	42
	Relation between juvenile offending and adult incarceration	44
	Gender differences	46
	Parental incarceration	48
	Limitations	52
	Implications and conclusions	54
	REFERENCES	57
	APPENDICES	74
	DISSERTATION APPROVAL	79

LIST OF TABLES

TABLE	Page
1. Model Fit Indices for 3-Factor Model of Delinquency Scale	34
2. Cronbach's Alpha for the 3 Factors	34
3. CFA Regression Weights for 3-Factor Model of the Delinquency Scale	35
4. Logistic Regression Predicting Reported Adult Incarceration (Men)	38
5. Logistic Regression Predicting Reported Adult Incarceration (Women)	38
6. Logistic Regression Predicting Adult Incarceration – Including Parental Incarceration	40
7. Logistic Regression Predicting Reported Adult Incarceration with Parental Incarceration as a Moderating Variable (Men)	41
8. Logistic Regression Predicting Reported Adult Incarceration with Parental Incarceration as a Moderating Variable (Women)	41

LIST OF FIGURES

FIGURE	Page
1. Uniform Crime Reporting Classifications	17
2. Proposed 3-Factor Model of the Delinquency Scale	33

CHAPTER I

Statement of the Problem¹

Prison populations are a growing concern in many countries worldwide (Walmsley, 2009). The United States (US) is no exception to this trend. In 2009, over 2.2 million people were incarcerated in U.S. prisons or jails, creating increased fiscal demands on limited public resources (Glaze, 2010; Taifa & Beane, 2009). While justice policies continue to rely on incarceration as a major approach to addressing crime, there appears to be little evidence that public safety is greatly enhanced by such methods (Taifa & Beane). Evidence does exist, however, that higher incarceration rates, rising from 100 per 100,000 persons in 1970 to more than 500 per 100,000 in 2009, have led to negative consequences for the families of incarcerated individuals (Clear, Rose, Waring, & Scully, 2003; Comfort, 2008; Sabol & West, 2010; Travis & Waul, 2003; Visher & Travis, 2003).

Increasingly, researchers are investigating the “collateral consequences” of incarceration (Hagan & Dinovitzer, 1999). Children of incarcerated individuals have been called the “forgotten victims of crime” (Matthews, 1983) and the “orphans of justice” (Shaw, 1992). According to Glaze and Maruschak’s (2008) analyses of data from 2004, about half of U.S.

¹ This research uses data from Add Health, a program project directed by Kathleen Mullan Harris and designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill, and funded by grant P01-HD31921 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. Special acknowledgment is due to Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Information on how to obtain the Add Health data files is available on the Add Health website (<http://www.cpc.unc.edu/addhealth>). No direct support was received from grant P01-HD31921 for this analysis.

Note: Use of this acknowledgment requires no further permission from the persons named.

prisoners were parents of children under the age of 18 years. Of those minor children, 22% were ages 4 years or younger, 30% were 5 to 9 years, 32% were 10 to 14 years, and 16% were 15 to 17 years. In effect, more than one third of these children were expected to reach 18 years of age while their parent was incarcerated. The number of children with mothers in prison more than doubled between 1991 and 2007, up by 131%, and the number of children with a father in prison grew by 77% (Murray, Farrington, & Sekol, 2012). Researchers and policy makers alike recognize the need to enact initiatives that focus on family strengthening and positive parenting techniques for those in correctional settings (Lindquist & Bir, 2008).

It is generally accepted that children with incarcerated parents are at risk for a variety of negative mental health and behavioral outcomes, despite current intervention strategies (Murray et al., 2012). The literature suggests that parental separation due to imprisonment can have profound consequences for children, including perpetuating intergenerational patterns of criminal behavior (Taifa & Beane, 2009). While no single factor or set of factors can directly cause an individual to become involved in crime, risk factors, such as parental incarceration, are often seen as cumulative in their effect (Taifa & Beane). There is ample evidence that parental incarceration can affect offspring criminality throughout the offspring's lifespan, from adolescence through adulthood (Farrington, Jolliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001; Fergusson, Horwood, & Nagin, 2000; Murray, Janson, & Farrington, 2007).

Research has also demonstrated that many adult offenders, whether or not the offenders experienced parental incarceration, persist in criminal behavior that generally began when the individuals were adolescents in contact with the juvenile criminal system (Taifa & Beane, 2009). There are mixed findings on the general mechanisms that lead some juvenile offenders to persist into adult criminality while other young offenders desist after adolescence. One promising

avenue of exploration is the concept of developmental trajectories of delinquency. Sampson and Laub (1993) pose a dynamic theory of the development of criminal behavior, where crime can be understood as a product of both individual differences and environmental, or life, events.

Building on attachment and social control theories, Sampson and Laub posit that (1) delinquency in childhood and adolescence can be explained by structural context, which is mediated by family and other social controls, and (2) there is a substantial amount of continuity in criminal behavior from childhood through adulthood (Piquero, Farrington, & Blumstein, 2003).

The goal of the present study is to examine more closely the mechanisms through which criminality develops in accordance with Sampson and Laub's (1993) theory. In particular, I measure different subtypes of juvenile offending and examine the likelihood of trajectories for each subtype leading to adult offending. In keeping with Sampson and Laub's theory that familial social controls mediate delinquency, I examine parental incarceration as a possible moderator for observed patterns of association between delinquency types and adult offending.

CHAPTER II

REVIEW OF THE LITERATURE

Part I: Theoretical Foundations of Delinquency

Attachment, Social Control, and Criminality

Previous research has investigated multiple theories in an effort to explain the mechanisms through which parental incarceration may affect children (Geller, Garfinkel, & Western, 2011). Some have drawn on attachment theory (Bowlby, 1973) to develop the concept that forced separation can disrupt parent-child bonds and harm children's social and emotional well-being (Sroufe, 1988). Based on these notions, the lack of quality contact between parents in prison and their children further exacerbates the negative outcomes associated with disrupted attachment patterns (Swisher & Waller, 2008).

Family, the primary socializing institution of youth, has long been recognized as important for predicting delinquency (Gault-Sherman, 2012). Social control theorists consider parenting as an important, if not the definitive, factor in predicting delinquency (Gault-Sherman). Social control theory, often referred to as social bonds framework, assumes that individuals are naturally inclined to engage in self-serving behaviors to benefit themselves, even though such behaviors may harm or take advantage of others. However, the bonds that people have to their beliefs and to other people stop individuals from engaging in more self-serving behaviors (Gault-Sherman). Hirschi (1969), in his examination of social control and social bond theories, describes the foundation of these theories: "a person is free to commit delinquent acts because his ties to the conventional order have somehow been broken" (Hirschi, p.3).

Hirschi (1969) argued that there are four elements of social bonds: attachment, commitment, involvement, and belief. Each bond is related to delinquent behavior.

Alternatively, the more one is bonded to others through one of the four elements the stronger the bonds become through the other elements. Social control can be enacted through different paths. The absence of one element of social control, though, increases the likelihood of delinquency and the eventual loss of all other elements of social control (Hirschi).

Sampson and Laub's Model of Criminality

While attachment and social control theories both account for individual differences between delinquent and non-delinquent populations, the theories fail to incorporate environmental effects, such as parental incarceration, which are beyond the control of, and interact with, the individual. Sampson and Laub (1993) address this interaction in their model on criminal careers. Crime, according to Sampson and Laub, is a product of individual differences and life events. This model is built upon three assumptions: (1) adolescent delinquency can be explained by structural context and is mediated by informal social controls (e.g., family and school); (2) there is a large degree of continuity of antisocial behaviors, across multiple life domains, from childhood through adulthood; and (3) variations in the quality of social bonds in adulthood, such as changes in family structure and individual responsibilities, can explain changes in criminality over the life course.

Research using different samples, indicators of life circumstance, methodologies, and periods of life course, indicates that both persistent individual differences and local life circumstances are important for understanding criminal activity over the life course (e.g., Horney, Osgood, & Marshall, 1995; Laub, Nagin, & Sampson, 1998; Piquero, MacDonald, & Parker, 2002; Sampson & Laub, 1993). In 1997, Sampson and Laub extended their dynamic model by identifying “cumulative disadvantage” (Piquero et al., 2003, p. 401). Specifically, involvement in delinquent behavior has “a systematic attenuating effect on social and

institutional bonds linking adults to society (e.g., labor force attachment, marital cohesion)” (Sampson & Laub, 1997, p. 144). The cumulative disadvantage postulate links delinquency to adult criminal activity in that delinquency can lead to failure in multiple life dimensions (school, incarceration, the labor market) and will likely lead to further adult crime (Piquero et al., 2003). Thus, according to Sampson and Laub’s (1993) model, an individual who has a predisposition to antisocial or rebellious behavior and experiences the environmental effect of parental incarceration is more likely to have broken social bonds and engage in delinquent acts. The disruption of social bonds in youth increases the prospect of that individual becoming an adult criminal.

Part II: Effects of Incarceration on Children

General Outcomes

Children of parents in prison are at risk for a variety of problems that affect social, emotional, and academic development (Dallaire & Wilson, 2010; Murray & Farrington, 2008; Murray et al., 2012; Murray, Farrington, Sekol, & Olsen, 2009; Wilbur et al., 2007). Parental incarceration has been linked to many negative effects on the child’s emotional state, and multiple studies confirm that these children are at heightened risk for (1) attachment disruption (Poehlmann, 2005; Poehlmann, Dallaire, Loper, & Shear, 2010), (2) internalizing disorders (Murray et. al, 2012; Murray & Murray, 2010), (3) mental health and (4) substance abuse disorders (Maruschak, Glaze, & Mumola, 2010). Geller, Garfinkle, Cooper, and Mincy (2009) also found that children exposed to parental incarceration are more likely to experience financial strain and display aggressive behaviors than their peers whose parents have not been incarcerated.

Murray et al. (2012) performed a meta-analysis of existing literature pertaining to the impact of parental incarceration on children and found that those with imprisoned parents are at risk for negative delinquent outcomes. Specifically, children with a history of parental incarceration were twice as likely to exhibit antisocial behaviors as children without incarcerated parents (Murray et al.). In their study, Murray and colleagues argued that children with incarcerated parents may be at risk for a wide range of behavioral outcomes including antisocial behaviors, mental health problems, drug use, and poor educational performance. They reviewed empirical evidence from 40 studies in a meta-analysis and controlled for behaviors prior to parental incarceration (e.g., parental criminality and children's antisocial behavior prior to parent's incarceration). Their analyses demonstrated a pooled effect size with an odds ratio (OR) = 1.4 ($p < .01$) (approximately 10%) indicating increased risk for antisocial behavior for children of incarcerated parents in comparison to their peers without parental incarceration. None of the other behavioral outcomes (mental health problems, drug use, and educational performance) had a significant association with parental incarceration.

Effects Beyond Parental Incarceration

Caution must be taken when interpreting the results of research on the offspring of incarcerated populations. Incarcerated populations are typically comprised of young, minority, and poorly educated individuals (Petersilia, 2003; Western, 2006). Consequently, the offspring of this population have many risk factors for negative outcomes even without consideration of incarceration of the parent (Geller, Cooper, Garfinkel, Schwartz-Soicher, & Mincy, 2012). However, children of incarcerated parents appear to be at heightened risk for multiple problems beyond the risk associated with similar disadvantaged populations (Dallaire & Wilson, 2010; Laubacher, 2010; Murray et al., 2012; Poehlmann, Park, Bouffiou, Abrahams, Shlafer, & Hahn,

2008). Wildeman (2010) addressed this issue by focusing on intra-family changes to examine the effects of incarceration on childhood aggression. Wildeman also found that paternal incarceration increases children's physical aggression (when comparing their pre- and post-paternal incarceration behaviors).

Geller et al. (2012) expanded on Wildeman's (2010) approach by using the same longitudinal sample to observe pre- and post-parental incarceration behaviors in children and adolescents. They extended those investigations by comparing in greater number and detail children whose fathers were absent due to incarceration to children whose fathers were absent for other reasons. Geller et al. used data from approximately 3,000 urban children who took part in the Fragile Families and Child Wellbeing Study, and applied cross-sectional and longitudinal regression models to results from measures on pre-incarceration child development and family fixed effects (e.g., behavioral ratings, family structure, and parental IQ) (Geller et al.). In addition to the advantage of having pre- and post-incarceration data, the use of a population-based sample provided a large comparison sample of children who were not selected based on convenience, as is commonly seen in a majority of the research (Geller et al.).

The results of Geller et al.'s (2012) investigation indicated that children whose fathers were incarcerated demonstrated increases in aggressive behaviors and attention problems, in comparison to their behaviors prior to paternal incarceration (Geller et al.). In their analyses, the authors were also able to estimate the effects of the types of paternal absence, such as divorce, death, incarceration, or estrangement. Paternal incarceration had significantly stronger effects on child development than other forms of paternal absence (Geller et al.).

Intergenerational Crime

Child and adolescent crimes. One of the greatest risks for children of incarcerated parents is committing illegal and delinquent acts as adolescents (Dallaire & Wilson, 2010; Laubacher, 2010; Murray et al., 2012; Poehlmann et al., 2008). In a nationally representative longitudinal study of adolescents in the United States, Roettger and Swisher (2011) compared rates of serious and violent delinquent behavior between 784 males whose fathers had been incarcerated and 5,344 males whose fathers had not been incarcerated. The males were in grades 7 through 12 at the time of the survey. Parental incarceration predicted serious and violent delinquency with an OR = 1.8. Thus, the odds that an adolescent male will perform a serious or violent delinquent act are nearly doubled if their fathers have been incarcerated (Roettger & Swisher).

Murray and Farrington (2005) compared the different outcomes between children who had experienced parental incarceration and children who had experienced parental criminality. Parental criminality was defined as a parent who has been convicted of a crime, but never has been incarcerated (Murray & Farrington). They found that parental incarceration positively predicted antisocial behavior and delinquency among working-class males in London, even after controlling for parental criminality and other childhood risk factors. Murray and Farrington also compared boys who had experienced parental incarceration and boys who had been separated from their parents for other reasons. A greater percentage of boys who experienced parental incarceration in the first decade of their life went on to be convicted (through adolescence up to age 32) than those boys who were separated from their parents for other reasons, at 48% and 25%, respectively. In another study in the U.S. among 138 juvenile delinquents from various ethnic groups, 42% of the juveniles came from homes with parents who had a criminal history (Murray et al., 2012; Myner, Santman, Cappelletty, & Perlmutter, 1998).

Research has also demonstrated that recidivism in young offenders is associated with parent criminality (Huesmann, Eron, Lefkowitz, & Walder, 1984; Niarhos & Routh, 1992; Osborn & West, 1979; Rutter & Giller, 1984). In the U.S., Katsiyannis, Zhang, Barrett, and Flaska (2004) conducted a 3-year study in the Midwest to ascertain factors associated with recidivism among juvenile offenders. They found that family pathology variables, such as parental criminality, were shown to predict recidivism in the juveniles, in addition to other factors.

Adult offending. Parental incarceration has also been linked with offspring adult offending (Farrington et al., 2001; Fergusson et al., 2000; Smith, 1991). Murray et al. (2007) conducted a study of 15,117 children born in Sweden in the same year (1953) as an English cohort used in Murray and Farrington's (2005) previous study, to test whether results in England were replicated in Sweden. Parental incarceration was generally a stronger predictor of offspring crime than parental conviction without incarceration (Murray et al.). If a parent was incarcerated when the offspring was between the ages of 0 to 6 years, 25% of those offspring went on to offend between the ages of 19 and 30 years. A comparison between the Swedish and English cohorts demonstrated that the effects of parental incarceration during childhood were more evident in England (OR = 4.1; CI = 1.1, 4.5) than in Sweden, (OR = 1.3; CI = 0.7, 2.5). The difference in OR was significant at $p < .01$ (Murray et al.).

In an analyses of data from the mother child sample of the National Longitudinal Survey of Youth 1979 (NLSY-1979), Huebner and Gustafson (2007) examined the effects of maternal incarceration on adult offspring crime. They hypothesized that adult offspring of incarcerated mothers would be more likely to come into contact with the adult criminal system, either through conviction of a crime or a sentence of probation (Huebner & Gustafson). In comparison to

offspring from non-incarcerated mothers, the offspring of incarcerated mothers were significantly more likely to be involved in the criminal justice system as adults, even after controlling for maternal separation, maternal criminality (or criminal acts that did not result in incarceration) and other risk factors. Huebner and Gustafson highlight, however, that, similar to previous studies, the original sample of incarcerated mothers was small ($N = 26$), leading to a small sample of offspring ($N = 31$), so these results must be interpreted with caution.

Parenting Influences on Trajectories

As the scientific interest in the development of juvenile delinquent behaviors has increased (Doherty, Laub, & Sampson, 2009; Miller, Malone, & Dodge, 2010), it has also been suggested that different parenting styles can affect developmental trajectories of delinquency (Gault-Sherman, 2012; Hoeve et al., 2007; Hoeve, Dubas, Eichelsheim, van der Laan, Smeenk, & Gerris, 2009). Strict authoritarian control (Farrington, 1989) and harsh punishment (Farrington, Loeber & Stouthamer-Loeber, 2003) are linked to high levels of delinquent and antisocial behavior, although effect sizes vary substantially across studies (Loeber & Stouthamer-Loeber, 1986).

There has been relatively little research examining the association of parental incarceration with offense specializations. In the study of Swedish youth, Murray and colleagues (2007) investigated parental incarceration and types and lengths of offspring offenses. Parental incarceration predicted higher rates of chronic offending than parental conviction without incarceration (Murray et al.). Parental incarceration also predicted different types of offspring crimes (committed between ages 19 to 30 years) with similar strength, reflecting the versatility of criminal careers (Murray et al.). In comparison to children whose parents had never been incarcerated, offspring of incarcerated parents had odds ratios of 2.7 (CI = 1.7, 4.1) for violence

and 3.0 (CI = 0.8, 3.2) for theft. These findings concurred with earlier findings examining an English cohort (Murray & Farrington, 2005).

Part III: Juvenile Delinquency and Adult Offending

Developmental Trajectories

General links between juvenile and adult incarceration have been found in various countries. In an Australian study, 91% of the juvenile offenders who were released under the Australian equivalent of probation went on to be involved in the adult corrections system, with at least half of those offenders serving some form of jail or prison sentence (Lynch, Buckman, & Krenske, 2003). In another study using a sample of Swiss men, characteristics of juvenile criminal history (e.g., versatility, violence, frequency) were better predictors of adult violent offending than socio-economic or psychiatric risk factors (Laubacher, 2010).

Tracy and Kempf-Leonard (1996) followed the criminal histories (up to age 26) for a 1958 birth cohort of 27,160 boys and girls from Philadelphia. They analyzed career continuity, finding that continuity was more common than discontinuity. Adult crime was more likely among former delinquents, while non-delinquents remained non-criminals as adults (Tracy & Kempf-Leonard). Interestingly, they also found that males who experienced probation rather than incarceration had a significantly lower probability of becoming adult offenders (the analyses were insignificant for females), indicating that juvenile incarceration did not necessarily inhibit or deter adult offenses (Piquero et al., 2003).

In a longitudinal study of adolescent males in South London, Farrington (2002) led a research team in collecting data over more than 30 years. The subjects were interviewed nine times - at ages eight, ten, fourteen, sixteen, eighteen, twenty-one, twenty-five, thirty-two, and forty-six. Other measures (including parent interviews, peer ratings, and criminal records) were

collected as well during this period. One of the many findings from the study was that 40% of the entire cohort was convicted of criminal offenses through the age of forty, indicating that a substantial number of the cohort persisted in offending through adulthood (Farrington, 2002, Piquero et al., 2003).

Criminal careers. With increasing empirical evidence linking adolescent delinquency to adult incarceration, there have been multiple theories as to the association between juvenile delinquency and adult offenses. For example, research on the correlations between age of first rule-violating behaviors and commission of a criminal activity has been extensively studied in the last four decades (e.g., Britt, 1992; Greenberg, 1974; Piquero et al., 2003; Rowe & Tittle, 1977; Steffenmeister, Allan, Harer, & Streifel, 1989; Tittle, 1988; Tittle & Grasmick, 1997). From these studies has arisen the “criminal career” theoretical approach. A criminal career is “the longitudinal sequence of crimes committed by an individual offender” (Blumstein, Cohen, Roth, & Visher, 1986, p. 12). This approach separates the aggregate rate of offending into two components: participation and frequency (Blumstein et al.). Additional dimensions of duration and seriousness can also affect the aggregate crime rates.

Gottfredson and Hirschi (1986, 1987, & 1988) critiqued the criminal career approach, claiming that attempts to identify lifespan incidents of individuals’ crimes were doomed to fail due to the necessary analyses of longitudinal research. Specifically, they doubted that longitudinal research designs could resolve questions of causal order. Ensuing research addressed these issues, leading to methodological advances in the study of longitudinal sequences of criminal career (Piquero et al., 2003). Most notably, research showed that “while the between-individual patterning of criminal careers was important, the within-individual differences in criminal activity over time...were more important” (Piquero et al., p.362).

Classifications of developmental trajectories. Research on within-individual differences in criminal careers has grown and with it has different classifications of developmental trajectories. For example, Moffitt (1993) argued for adolescence-limited and life-course persistent offenders as two patterns of offending. Some adolescent delinquents ceased their criminal activity before becoming adults, while other adolescents persisted in offending as adults. Nagin and Land (1993) examined delinquency patterns among a British male sample of adolescents and delineated four distinct offending trajectories: adolescence-limited, high-level chronics, low-level chronics, and non-offenders.

In accordance with the criminal career approach, Hoeve and colleagues (2007) identified five distinct delinquency trajectories by incorporating the level and change over time in seriousness of offenses. Using a sample of approximately 500 boys between the ages of 10 to 19 years in the Pittsburgh metropolitan area, they identified 27.2% of the boys as “non-delinquent” (self-reports of little to no delinquency), 27.6% as “minor-persisting” (non-serious delinquency), 6.8% of the boys were identified on a “moderate desisting” trajectory (more serious delinquency in early teens, followed by a steep decline), 24.2% of the boys were placed on “serious persisting” trajectory (due to reporting of continuous serious delinquency throughout the follow-up period), and 14.3% of the boys were on the “serious desisting trajectory” (they reported high levels of serious delinquency, peaking in teenage years, but showing marked desistance later on). The serious persisting trajectory was the most concerning of these five types of delinquency. Boys identified in this group engaged more frequently in delinquent acts and a higher proportion of theft and violent activities in comparison to boys in other delinquency pathways (Hoeve et al.).

Research on offense specialization has also grown in the quest to identify developmental trajectories of delinquency and crime. Thus far, the literature has demonstrated mixed results on the versatility in offending (Deane, Armstrong, & Felson, 2005). Initially, researchers demonstrated versatility in offending (Blumstein, Cohen, Das, & Moitra, 1988; Bursik, 1980; Farrington, Snyder, & Finnegan, 1988; Kempf, 1987; Klein, 1984; Lattimore, Visher, & Linster, 1994; Osgood, Johnston, O'Malley, & Bachman, 1988; Piquero 2000; Piquero, Paternoster, Mazerolle, Brame, & Dean, 1999). Horney and colleagues (1995) conducted a longitudinal study and observed that offenders did not tend to repeat the same type of offense, but rather switched between offenses. Osgood and colleagues (1988) showed via factor analyses that individual differences in criminal violence reflect a general tendency towards crime rather than a specific tendency towards a type of crime or violence. For example, it has been shown that individuals who commit violent crimes tend to commit nonviolent crimes as well (Gottfredson & Hirschi, 1990).

At first glance criminals may appear to commit a variety of crimes, yet a closer look reveals some themes in individuals' offenses. Differences in frequencies and persistence, in addition to violent versus nonviolent tendencies, have been demonstrated. Piquero (2000) found that cognitive testing served to discriminate between frequent offenders, violent offenders, and frequent and nonviolent offenders. Others argue that frequency of offending is enough to distinguish violent and nonviolent offenders because increased offenses also meant increased breadth of those offenses including violent crimes (Farrington, 1991; Piquero).

Deane et al. (2005) used marginal logit modeling to analyze nine self-reported delinquent behaviors (with a tenth category representing "No Offense") from the Add Health study (N = 15, 629). They found that violent offenders were more likely to engage in additional violent

offenses, and that nonviolent offenders persisted in committing nonviolent offenses. Item specific analyses did not yield evidence of offense generalization between violent and nonviolent offenses (Deane et al.). When generalization was present at the item level, it was generally weak against the specialization effect (Deane et al.)

Part IV: Measuring Delinquency

The quantification of delinquency has generally been achieved through two methods: self-report and review of official records (Elliot, 1998; Piquero et al., 2003; Piquero, Macintosh, & Hickman, 2002). Each method is vulnerable to sources of error. Official reports only identify those individuals who are caught committing criminal acts and the data tends to reflect gender and social status biases (Piquero, Macintosh, et al., 2002). Self-reports for delinquency, introduced first by Short and Nye (1957), are less susceptible to biases and have generally shown that all youth, regardless of race, gender, or social class, engage in some form of delinquent or criminal behavior and that many offenses escape detection by organized law enforcement (Piquero, Macintosh, et al., 2002).

Official reports were the first to reflect the differences between offenses, in part because they were developed prior to the existence of self-report measures. The separation of different crimes based on the seriousness of the offense began in the 1920's when the Uniform Crime Reporting (UCR) program was developed by the International Association of Chiefs of Police (IACP) (Mosher, Miethe, & Phillips, 2002). The UCR was intended to provide more uniformity in definitions of crimes and allow for more accurate data collection on crime rates. Participation in the UCR program is voluntary for law enforcement, but as of 1999 different national, state, and municipal agencies reported on a total of 97% of the U.S. population (Mosher et al.).

By developing the UCR program, IACP formally acknowledged that not all crimes are equally important and devised an Index of Crimes that separated the different offenses (Mosher et al., 2002). Part I Offenses, or the seven major types of crime that are generally serious in nature and identified by victims or witnesses, are those most likely to be reported to police (Mosher et al.). Part I Offenses (also known as Index Offenses) are separated into two categories, Violent Crime and Property Crime. Part II offenses (also referred to as Nonindex Offenses), encompass other, lesser crimes. Examples of these, and the Part I offenses, can be found in Figure 1.

Index Crimes	
Part I Offenses	Part II Offenses
<i>Violent Crime</i>	Other assaults
Murder/Nonnegligent Manslaughter	Forgery/Counterfeiting
Forcible Rape	Fraud
Robbery	Embezzlement
Aggravated Assault	Vandalism
<i>Property Crime</i>	Stolen property (buying, receiving, possessing)
Burglary	Vandalism
Larceny-Theft	Prostitution/Commercialized Vice
Motor Vehicle	Weapons (Carrying, possessing, etc.)
Arson	Sex Offenders (except forcible rape)
	Drug Abuse Violations
	Gambling
	Offenses against Family & Children
	Driving Under the Influence
	Liquor Laws
	Drunkenness
	Disorderly Conduct
	Vagrancy
	All Other Offenses (except Traffic)
	Suspicion
	Curfew/Loitering
	Runaway

Figure 1. Uniform Crime Reporting Classifications (Mosher, Miethe, & Phillips, 2002).

Self-report measures of crime and correlates were intended to capture and describe the full scope of illegal behavior outside of the information of official statistics. Short and Nye's (1958) seminal work on the measurement of youth involvement in delinquent activities demonstrated, among other things, that (1) self-reported delinquent behavior is similar to official reports on delinquency in terms of trends in offending (e.g., gender differences, arrest rates) and (2) self-report results revealed a more even distribution of reports of delinquency across the socioeconomic groups, as opposed to official reports that had concentrated reports of delinquency in lower socioeconomic groups (Short & Nye; Mosher et al., 2002). Another difference between official reports and self-report data, as pointed out by critics of Short and Nye's measure and other self-report instruments, is that the focus tends to be less on serious offenses, and more on "trivial" behaviors (e.g., defying parents, truancy) (Mosher et al.).

Self-report measures have been used extensively in the 50 years following Short and Nye's (1957) work (Mosher et al., 2002). As statistical methods have become more advanced and sophisticated, so too has the research using the self-report instruments. One such example is the National Youth Survey (NYS), developed by Elliot (1976) and funded by the National Institute of Mental Health, which was designed to "provide prevalence and incidence estimates of the commission of delinquent activities by youth" (Mosher et al., p. 109). In a face-to-face interview, respondents were asked to report on the number of times they were engaged in delinquent or criminal activities, with follow up questions based on the initial responses (Elliot, Huizinga, & Morse, 1986). The 47 activities that were examined directly paralleled the offenses listed in the UCR program, including all Part I offenses (with the exception of homicide), and 75% of Part II offenses (Elliot; Mosher et al.). When reporting results from the different groups of respondents between 1976 and 1980, Huizinga and Elliott (1987) grouped responses from the

47 activities into (a) General Delinquency, including less serious offenses (e.g., minor theft, minor assault, property damage), status offenses, and serious offenses (e.g., felony theft, felony assault, robbery); (b) Index Offenses (all UCR Part I offenses except homicide and minor larcenies); (c) Felony Assault (aggravated assaults, sexual assaults, and gang fights); and (d) Felony Theft (grand theft, auto theft, burglary, and possession of stolen goods).

Elliot, Ageton, and Huizinga (1985) developed the Self Report of Delinquency (SRD) based on the items that Elliot (1976) included in the NYS survey. One of the main self-reports used in current studies, the SRD, has been shown to have concurrent, criterion, and predictive validity (Farrington et al., 1996; Huizinga, 1991) and studies have demonstrated that the SRD has “acceptable levels of reliability and validity” (Huizinga & Elliott, 1986, p.294). The psychometric properties of self-report measures pertaining to delinquency, such as those items used on the SRD and NYS, have not been extensively studied in the literature, with research focusing mostly on response error (Bridges, 1987; Wyner, 1981) and testing, maturation, and panel effects (Lauritsen, 1998). Some scholars contend that the SRD and other self-report measures are subject to testing effects or changes in content validity associated with the age of the respondent (Lauritsen; Piquero, Macintosh, et al., 2002).

Despite the difficulties associated with the SRD and other self-reports of criminal and delinquent acts, many argue that data provided by these measures are invaluable (Piquero, Macintosh, et al., 2002). Researchers have encouraged methodological studies to further assess the psychometric soundness of different scales to capture the wide breadth of delinquent activities that are reported on using the SRD (Bridges, 1987; Farrington, Loeber, Stouthamer-Loeber, van Kammen, & Schmidt, 1996; Huizinga, 1991). Unfortunately, there are only a handful of papers on this subject.

Piquero, Macintosh, et al. (2002) attempted to address this issue by using data from the first wave of the National Youth Survey to test whether the 24-item SRD (Elliott et al., 1985) included in the survey met requirements of fundamental measurement and was consistent across subgroups (e.g., gender, age, race, and place of residence). They used the Rasch measurement model to analyze the data. The Rasch method is an item response model where the persons being measured are separated from the specific sample items chosen for the test, in an attempt to control for specific objectivity (Fox & Jones, 1998; Piquero, Macintosh, et al.). Based on their results, Piquero, Macintosh, et al. concluded that there was a general and significant misfit of delinquency items from the original Elliott et al. scale across different subgroups, and suggested that an alternative 9-item version, of the SRD be used (Piquero, Macintosh, et al.).

The National Longitudinal Study of Adolescent Health (Add Health) uses a 15-item version of the SRD (Harris et al., 2009). The developers of the Add Health survey have not indicated in their documentation whether there was a theoretical or statistical reason for using a shorter version of the original 24-item SRD (Harris et al., 2009). This is especially interesting given Piquero, Macintosh, et al.'s (2002) suggestion of using the 9-item version. There has yet to be a study that investigates the psychometric properties and the possibility of a multiple-factor structure of the 15-item version of the SRD used on the Add Health survey.

In keeping with the classification system of the UCR, the theoretical differences in offending (as presented above in previous sections), and the method in which Huizinga and Elliot (1987) originally presented their results, it is logical to assume that there could be three different types of offending captured by using any version (24-item, 9-item, or 15-item) of the SRD: Violent Transgressions, Property Theft, and Minor Transgressions. The items provided on the Add Health survey include delinquent behaviors that may or may not have been understood

as criminal activity. For example, the item “Took part in a fight with a group of your friends” may or may not have had a criminal context. Delinquent behaviors represent antisocial behaviors that may or may not be prosecutable. Thus, a better theoretical delineation of the three subtypes of criminal activities, when applied to juvenile delinquency, may be a distinction between violent transgressions, transgressions for personal gain, and mischief or minor transgressions. The possible presence of these factors or subscales on the SRD needs to be investigated in order to look more closely at possible developmental pathways and specification of crimes for individual delinquents (Lauristen, 1998; Piquero, Macintosh et al.).

Part IV: Summary and The Present Study

Current literature reveals that while several studies have investigated delinquency rates among youth, many have used either smaller data sets or have been performed in other countries (Laubacher, 2010; Murray et al., 2007; Murray & Farrington, 2005; Murray et al., 2012). Those longitudinal studies which have been performed in the U.S., using, for example, data from the Fragile Families and Child Well Being study, the National Youth Survey, or Add Health, have focused on individual traits, such as social class, genes, or delinquency subtypes (Guo, Roettger, & Shih, 2007; Nagin & Tremblay, 1999) or, alternatively, environmental factors, such as parental incarceration, peer groups, or neighborhood effects (Gellar et al, 2012; Haynie, 2001; Peeples & Loeber, 1994). Research has yet to look at developmental trajectories of delinquency through both the lenses of individual subtypes of delinquency and parental incarceration.

The goal of the present study was to examine the effects of parental incarceration on the developmental trajectory of delinquency into adult criminality. In accordance with Sampson and Laub’s (1993) theory that criminal careers are generally dynamic and subject to persistent individual differences and life events, the broader aim of this study was subdivided into three

objectives to address the differences in criminal careers and life events which may affect an individual's progression from a delinquent youth to an adult offender. First, this study investigated whether there are specific offense-related subtypes of delinquency as evaluated by the Add Health measures. Next, the relation between different delinquency subtypes and incidence of adult offending was examined. Finally, the role of parental incarceration was examined to observe whether having a parent incarcerated (before the subject was 18 years old) moderated the trajectories between the different delinquency subtypes and incidence of adult offending.

CHAPTER III

METHODOLOGY

National Longitudinal Study of Adolescent Health

Data for the present study were collected through the National Longitudinal Study of Adolescent Health (Add Health). Add Health is a school-based longitudinal study of a nationally-representative sample of adolescents in grades 7 through 12 in the United States in 1994-1995 (Harris et al., 2009). Through multiple collection components (e.g., in-home interviews, self-reports, peer-reports) data were collected from adolescents, their peers, school administrators, parents, siblings, and romantic partners. There are currently four waves of data collection available, including four respondent in-home interviews and surveys. The purpose of the Add Health study was to collect data to use in “exploring the influences of both the individual attributes of respondents and the attributes of their various environments on health and health-related behavior” (Harris et al.).

Procedures

Add Health employs a complex survey design that includes regional stratification, a cluster sample design using schools as primary sampling units, and oversamples of special populations to select a probability-based and representative sample of school students from grades 7 through 12 in the U.S. (Harris et al., 2009). A school was eligible participation in the study if it included an 11th grade and had a minimum enrollment of 30 students. Incorporation of systematic sampling methods and implicit stratification into the Add Health study design ensured this sample was representative of U.S. schools with respect to region of country, urbanicity, school size, school type, and ethnicity (Harris et al.).

As part of the first wave (Wave I) data collection for Add Health, participating adolescents took a Computer-Assisted Personal Interview (CAPI)/Audio Computer-Assisted Self Interview (ACASI). Written informed consent was obtained from the parent or legal guardian and the adolescent. Trained interviewers went to participants' homes, set up the CAPI/ACASI system, and asked more sensitive questions in person.

In 2008 and 2009, a fourth in-home interview was conducted with the original Wave I respondents (Harris et. al., 2009). The interviews consisted of the CAPI (for less sensitive questionnaire items) and the CASI (for more sensitive questionnaire items). Following the 90-minute interview, interviewers took physical measurements and collected biological specimens, which are not relevant to the current study (Harris et al.).

Participants

Participants attended 144 schools in 80 school districts and completed an in-school questionnaire (Wave I). Those who did not complete a questionnaire but were on the school roster were still eligible for selection in the study (N = 90,000). Between April and December 1995, a sample of these students (N = 27,000) and their parents was selected for in-home interviews (Wave I). Of the 27,000 students deemed eligible, 20,745 adolescents participated in the in-home interviews and 17,669 parents completed the parent questionnaires.

The Wave I sample included 10,263 (49.5%) males and 10,480 (50.5%) females with a mean age of 16.13 years (range 11 to 21) and in grades 7 through 12. Sixty-two percent of participants were identified as White, 23% as African American, 6.4% as Asian or Pacific Islander, 6.6% as Other, and 1.2% as American Indian or Native American. In a separate item on the self-report questionnaire, 17% of the sample identified as Hispanic, while 82.7% did not.

At the time of the Wave I interview, 11.2% of the sample (N = 2,326) was receiving federal aid or food stamps and 85.8% (N = 17,792) was not.

At the time of the Wave IV interview, the participants were 24 to 34 years old (mean age of 29 years). Participants were living in all 50 states and a total of 80.3% (N = 15,701) of eligible sample members were interviewed (92.5% of the original Wave I sample was located). The race of the participants was reported to be 69.7% White (N = 10,945), 23.1% Black or African American (N = 3,620), 6.1% Asian or Pacific Islander (N = 953), and 1.0% American Indian or Alaska Native (N = 155). Of those interviewed, 23.7% (N = 3,716) reported that they or someone else in their household had received public assistance, welfare payments or food stamps, while 76.1% (N = 11,952) reported not having received such assistance.

Measures

Measures for the current study contain items regarding juvenile delinquency acts, adult criminal acts, and parental incarceration. For the purposes of these analyses, data collected via self-report questionnaires at two different time points, Wave I (1994 – 1995) and Wave IV (2007 – 2008), were used.

Sample weighting. Stratum, cluster, and individual weights as provided in the Add Health database were incorporated to account for the complex survey design.

Covariates. There are multiple demographic and familial correlates with delinquency and incarceration that require statistical control (e.g., Deane et al., 2005; Gault-Sherman, 2012; Huebner & Gustafson, 2007). Mirroring previous research, this study accounts for these covariates in the analyses by including participant demographic variables of age, race, gender, and socioeconomic status in the models as controls which were collected during Wave I. Demographic variables are based on responses to items delineated in Appendix A.

Delinquency scale. The self-report of delinquency scale (SRD; Elliott et al., 1985) has formed the basis of much understanding of delinquency today (Piquero et al., 2002). Multiple studies, including the National Youth Survey (Elliott, Huizinga, & Menard, 1989), the three Office of Juvenile Justice and Delinquency Prevention-funded longitudinal studies in Rochester (Thornberry, Krohn, Lizotte, & Chard-Wiershem, 1993), Denver (Huizinga, Esbensen, & Weiher, 1991), and Pittsburgh (Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi 1998), and the National Gang Resistance Education Training programs (Esbensen & Osgood, 1999) utilized the SRD, or a variation of the SRD (Piquero et al.).

Fifteen items from the Delinquency Scale were obtained during the self-administered portion of the Wave I in-home interview and survey. The Add Health survey was constructed by incorporating heterogeneous items from different scales. The authors of the Add Health survey (Harris et al., 2009) state that the Delinquency Scale used on their survey is also derived from the Elliott et al. SRD (1985). However, the authors do not comment on why they chose only those 15 items out of the original 24 items. All 15 items from the SRD on the Add Health survey were analyzed for a few reasons. Currently, there do not appear to be any studies which have looked at the reliability and validity of the Delinquency Scale from the Add Health survey. Although there are only 15 items from the SRD on the survey, the authors made a calculated decision to use those items, and it is worth examining whether this was a psychometrically sound decision. Additionally, Piquero et al. (2002) made their recommendation to use a 9-item version of the SRD in place of the 24-item SRD after comparing the two measures. Piquero et al. (2002) did not compare the 9-item SRD to a 15-item SRD, so there is no empirical evidence that points to using a 15-item version rather than the 9-item version.

The 15-item Delinquency Scale used during the Wave I in-home questionnaire of the Add Health Survey was administered via ACASI software, described above. Participants had 5 answer choices for all 15 items: “never,” “1-2 times,” “3-4 times,” “5 or more times,” and “I don’t know.” The software scoring the responses also recorded “legitimate skips” and “refused to answer.” A copy of the Delinquency Scale can be found in Appendix B.

Adult incarceration and parental incarceration. Adult incarceration data is captured by an item on the Wave IV Add Health survey. The item asks how long the subject has spent in jail or prison since their 18th birthday (See Appendix C). A dichotomous variable was constructed to reflect the responses from the item, where those individuals who have spent any amount of time in prison or jail were coded as a “1” (Adult Incarceration). Those individuals who stated that they spent no time in prison or jail were coded as “0” (No Adult Incarceration). Individuals who left the question blank or refused to answer were coded as missing data.

The Wave IV in-home questionnaire of Add Health queries respondents on the incarceration of respondents’ fathers and mothers. Unfortunately, there is no item that specifically asks whether a parent was incarcerated prior to or after the respondent’s 18th birthday. In order to quantify parental incarceration during childhood and adolescence, a dichotomous variable was constructed based on the responses to four items that reflect whether and when the respondent experienced parental incarceration (Appendix D). If either parent had been incarcerated, and the respondent revealed that the parent was incarcerated between the respondent ages of 0 (less than a year) to 18 years, the respondent received a “1” (Parental Incarceration). If neither parent had been incarcerated or the parent was incarcerated before respondent’s birth or after the respondent’s 18th birthday, the respondent received a “0” (No Parental Incarceration).

Previous studies have used self-reports and official records to gather information on both parental incarceration and offspring adult crime (e.g., Huebner & Gustafson, 2007; Murray et al., 2007; Murray et al., 2012). Official records are not available for the Add Health data set. However, in the absence of those records, self-report measures have been demonstrated to provide reliable information (Elliott & Ageton, 1980; Piquero et al., 2002).

Data Analyses

Data analyses were conducted using Mplus version 6.12 for Windows and IBM SPSS version 20 for Windows. Analyses were conducted with three primary objectives: (1) to investigate the possibility of a three-factor structure of the 15-item Delinquency Scale from Wave I of the Add Health Survey, (2) to examine the adult incarceration rates of the Wave IV respondents as an external criterion for the presence of the three-factor model of the Delinquency Scale from Wave I, and (3) to identify whether a relation existed between juvenile delinquency trends (as indicated by factor scores on the Delinquency Scale), adult incarceration rates, and parental incarceration.

Objective 1

Analyses conducted for Objective 1 were designed to explore whether items on the Delinquency Scale from Wave I would load onto different factors. Confirmatory factor analysis (CFA) was performed towards this end. Two of the items, “steal something for less than \$50” and “take something from a store without paying for it”, appeared to capture the same type of information. Thus, based on theoretical rationale, the “steal something for less than \$50” item was removed. The remaining 14 items from the Delinquency Scale were used in the CFA. With these items, factor correlations were freely estimated and error terms were uncorrelated. CFA was used to evaluate the model as it provides a more rigorous examination of a test’s factorial

structure than exploratory factor analytic procedures (Greenbaum & Dedrick, 1998). The robust weighted least squares (WLSMV) estimator in Mplus v. 6.21 was used for CFA, as there are less than 5 measured categories (“never,” “1-2 times,” “3-4 times,” and “5 or more times,” all other responses were coded as missing) for each of the 14 items. One advantage to using Mplus was the ability to utilize the full model as WLSMV is a full information maximum likelihood estimator. Another advantage to using the full model is that listwise deletion was not required.

A three-factor structure was proposed based on a review of the literature, theoretical conceptualizations of the scale, and exploratory analyses. The three factors were meant to identify increasingly serious delinquent behaviors. The Minor Transgressions scale was comprised of the six items which captured the least severe delinquent behaviors. More serious criminal behaviors were captured had five items included on the Transgressions for Personal Gain. The most egregious behaviors delineated on the Delinquency Scale comprised the Violent Transgressions scale (three items). See Figure 2 for division of items onto the three proposed scales.

There are different measures for evaluating the model of fit. In this analysis the Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), and the Tucker Lewis Index (TLI). The CFI and TFI usually range between 0 and 1 and a larger value indicates a better the fitting model. In this case values of .90 or greater were considered as evidence of a marginal fitting model and values of .95 or greater were considered as evidence of a good fitting model. The conventional guidelines for RMSEA, where a smaller value indicates a better fitting model ($\geq .10$, poor fit; $\leq .08$, adequate; and $\leq .05$, good) were used (Muthen & Muthen, 2009). Alpha reliabilities were also computed for each scale.

Participants who were missing sample weights for Wave I, demographic information, or did not provide an answer to one or more of the delinquency scale items, were not included in the CFA.

Objective 2

The focus of Objective 2 was to investigate the relation between the types of juvenile offending (as delineated by the different factors on the Delinquency Scale) and adult incarceration. Aggregate scores were computed from the individual items for the different delinquency factors (“Minor Transgressions,” or MT, “Transgressions for Personal Gain,” or TPG, and “Violent Transgressions”, or VT) using SPSS version 20. Using Mplus version 6.21 weighted logistic regressions using maximum likelihood ratios (MLR) were then conducted with demographic variables (age, gender, race, and socioeconomic status) to assess the contribution of each variable to adult incarceration. Next, each factor score was added to the weighted regression one by one, starting with MT, then TPG, and finally VT, to examine the contribution of the individual factor scores to adult incarceration.

Objective 3

The aim in the final step of the analyses was to examine whether parental incarceration had a moderating effect on the previously demonstrated relations of the three factors with adult incarceration. A series of three separate weighted logistic regression analyses were performed using MPlus v. 6.12 to look at the possible interaction effects of parental incarceration by factor score on adult incarceration. The variables entered into the weighted logistic regression were the covariates (age, gender, race, and SES), factor scores, parental incarceration, and the factor score interaction with parental incarceration, which was dependent on which individual factor was being assessed in the regression (e.g., Minor Transgressions x Parental Incarceration).

Interactions were considered significant when $p < .05$. Maximum likelihood ratios (MLR) were used to analyze the model estimates.

CHAPTER IV

RESULTS

This chapter is divided into several sections, following the outlined objectives in Chapter III. The first section presents results from the confirmatory factor analysis (CFA) and the proposed three-factor structure of the Delinquency Scale. The second section explores the possible contribution of demographic variables to the dependent variable, adult incarceration. After those findings are reviewed, the associations between each of the factors Minor Transgressions (MT), Transgressions for Personal Gain (TPG), and Violent Transgressions (VT) are presented, looking at the additive effects of the factors in order of least serious offenses to most serious. The third and final section of this chapter identifies possible effects of parental incarceration on adult incarceration, above and beyond the contributions of demographic variables and factor scores, and examines any interaction effects between parental incarceration and the individual factors.

Objective 1: Confirmatory Factor Analysis (CFA) of a 3-Factor Model of the Delinquency Scale

The hypothesized three factor structure for the Delinquency Scale is presented in Figure 2. Individuals who were administered the Wave I in-home interview (N = 20,745) were considered for inclusion in the confirmatory factor analysis (CFA) to examine whether the proposed three-factor model met criteria for a good fitting model. Those participants who did not answer one or more of the delinquency scale items were omitted from further analyses (N=6,004) leaving a sample size of N = 14,741. Measures of model fit for the hypothesized three factor model described above are presented in Table 1. All indices were generally favorable and in-line with historically good fitting model recommendations in that the CFI and TLI were equal to or greater than .90. The RMSEA also met the recommendations for goodness

of fit (<.05). Internal consistencies for the three scales were measured using Cronbach's alpha and are presented in Table 2. The α 's of the three scales (range .70 to .76) were on the low end what is generally accepted as the cutoff point for internal consistency (.70-.95) (Tavakol & Dennick, 2011).

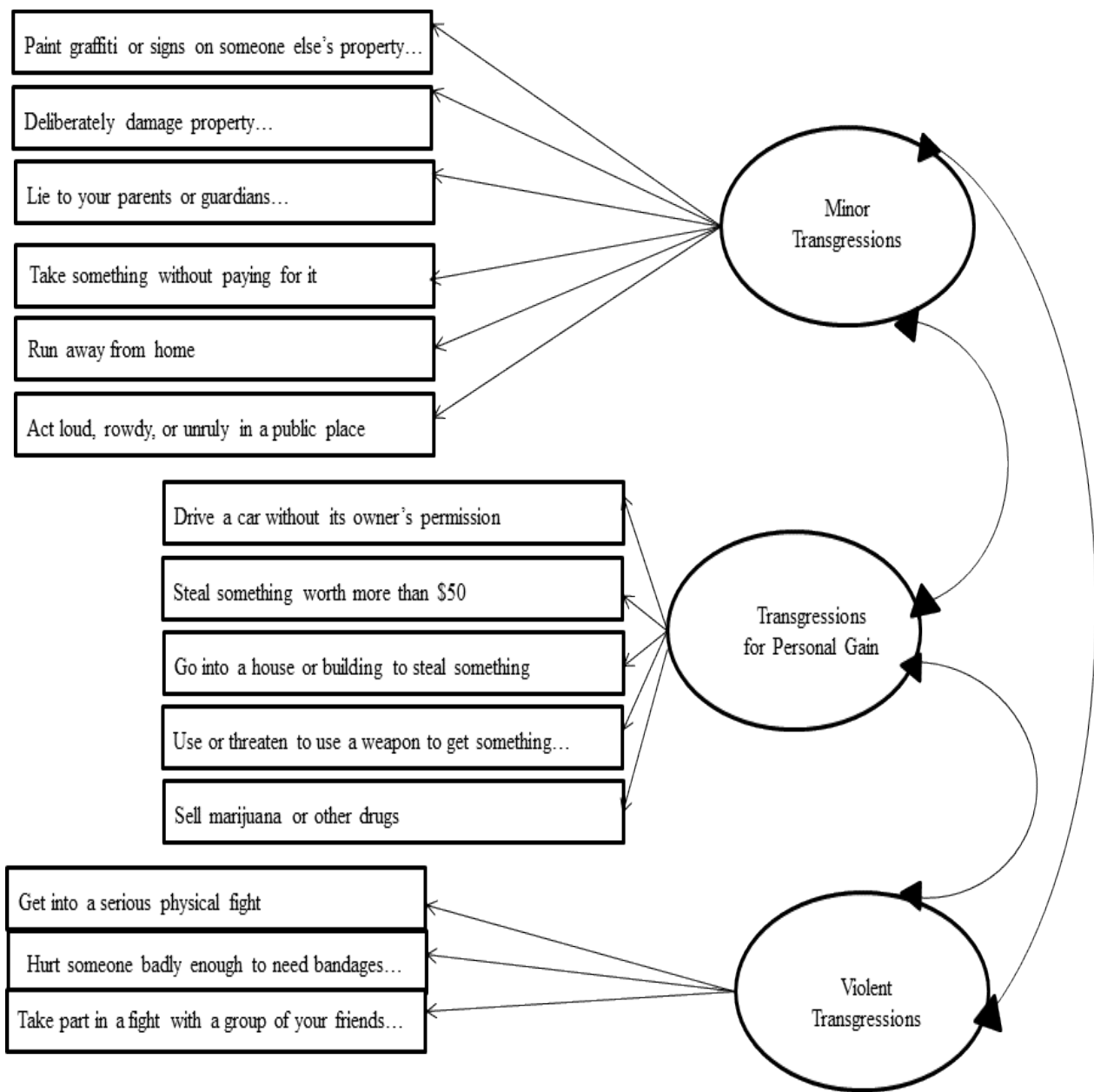


Figure 2. Proposed 3-Factor Model of the Delinquency Scale.

Table 1

Model Fit Indices for 3-Factor Model of Delinquency Scale

	<i>TLI</i>	<i>CFI</i>	<i>RMSEA</i>
Hypothesized Three-Factor Model	.91	.93	.04

Table 2

Cronbach's Alpha for the 3 Factors

<i>Scale</i>	<i>α</i>
Minor Transgressions	.71
Transgressions for Personal Gain	.70
Violent Transgressions	.76

With the CFA, inspection of the factor loadings linking each item to their respective factors revealed that all were moderately large (range .42-.83) and statistically significant, $p < .001$. For specific item loadings, refer to Table 3. A correlational matrix of the individual items can be found in Appendix E. The MT and TPG were moderately correlated with one another, ($r = .57$). The VT was moderately correlated with the MT and TPG Scales, $r = .31$ and $r = .45$, respectively.

Table 3

CFA Regression Weights for 3-Factor Model of the Delinquency Scale

<i>Variable</i>	<i>Estimate</i>	<i>SE</i>	<i>P</i>
Factor 1: Minor Transgressions			
Paint graffiti or signs on someone else's property or in a public place	.75	.02	<.01
Deliberately damage property that didn't belong to you	.76	.01	<.01
Lie to your parents or guardians about where you had been or whom you were with	.42	.01	<.01
Take something without paying for it	.69	.02	<.01
Run away from home	.51	.02	<.01
Act loud, rowdy, or unruly in a public place	.51	.01	<.01
Factor 2: Transgressions for Personal Gain			
Drive a car without owner's permission.	.60	.02	<.01
Steal something worth more than \$50	.83	.01	<.01
Go into a house or building to steal something	.77	.02	<.01
Use/Threaten to use a weapon to get something from someone	.81	.02	<.01
Sell marijuana or other drugs	.77	.02	<.01

Factor 3: Violent Transgressions

Get into a serious physical fight	.75	.01	<.01
Hurt someone badly enough to need bandages or care from a doctor or a nurse.	.81	.01	<.01
Take part in a fight where a group of your friends was against another group	.78	.01	<.01

Objective 2: Relation between juvenile delinquency and adult incarceration

Prior to examination of the relation between juvenile delinquency and adult incarceration, analyses were run to investigate the effects of demographic variables of age, gender, race, and socioeconomic status (SES) on adult incarceration. Those individuals who did not have a Grand Sample Weight for Wave IV or who did not answer one or more items that were being used in the analyses (delinquency scale and adult incarceration variables) were excluded (N = 6,411). Analyses revealed no significant differences in adult incarceration rates between groups defined by a 2-category race variable of White and Other (Black, American Indian/Native Alaskan, Hispanic, Asian/Pacific Islander, or Other) or SES. There were significant gender differences in reported rates of adult incarceration across the three scales (MT, TPG, and VT). Given this finding, separate analyses were run for men (N = 6,602) and for women (N = 7,732) in the examination of the possible link between juvenile delinquency subtypes and adult incarceration rates.

Weighted logistic regression analysis using maximum likelihood ratios (MLR) was employed to evaluate the relation of the factor scores for each participant and his/her self-reported experiences of incarceration as an adult (18 years or older).

Three sets of analyses were run for each gender, resulting in six analyses total. MT factor scores did not significantly predict whether or not adult incarceration was reported for both males and females. Regression analyses for males and females on the TPG factor indicated that TPG factor scores significantly contributed to reported rates of adult incarceration, above and beyond control variables (age, race, and SES) and the contribution of the MT scale. Additionally, logistic regression of adult incarceration on the VT factor was also significant for both genders (above and beyond contributions from control variables, the MT factor, and the TPG factor). For both the TPG and VT regressions, the Adjusted R^2 and the change in the Adjusted R^2 were calculated. For men, the unique contribution of the TPG factor on adult incarceration was .01, but that of the VT factor was relatively larger, $\Delta R^2 = .02$. For women, the inverse was found, in that the unique contribution of the VT factor to adult incarceration was smaller (.02) than the contribution of the TPG factor to reported adult incarceration (.06). Tables 4 and 5 present the standardized regression coefficients (β) and change in Adjusted R^2 values (for the appropriate regressions) for each step of the analyses for men and women, respectively.

Table 4

Logistic Regression Predicting Reported Adult Incarceration (Men)

<i>Variable</i>	β	<i>SE</i>	<i>p</i>	<i>Adjusted R²</i>	ΔR^2
Covariates (Age, Race, SES)	.17	.20	.41	.01	
Minor Transgressions	< .00	.02	.93	.03	.02
Transgressions for Personal Gain	.07	.03	.03**	.04	.01
Violent Transgressions	.14	.02	.00*	.06	.02

* $p < .01$ ** $p < .05$

Table 5

Logistic Regression Predicting Reported Adult Incarceration (Women)

	β	<i>SE</i>	<i>p</i>	<i>Adjusted R²</i>	ΔR^2
Covariates (Age, Race, SES)	-.27	.15	.08	.01	
Minor Transgressions	<.00	.02	.95	.01	.01
Transgressions for Personal Gain	.07	.03	.04**	.07	.06
Violent Transgressions	.08	.03	.000*	.09	.02

* $p < .01$ ** $p < .05$

Objective 3: Moderating effect of parental incarceration on the relation between juvenile delinquency subtype and adult incarceration

Parental incarceration was captured by the computation of a new variable (Parent/Parent Figure Incarcerated, PPFi) based on the information gathered through six items on the Wave IV In-Home interview. These six items captured whether a respondents Mother, Mother-figure, Father, or Father-figure spent time in jail or prison, and how old the respondent was when the individual was incarcerated (See Appendix D for exact items). Subjects who responded Yes to either of the items asking about parental incarceration and reported being between birth and 18 years old at the time of their parent's incarceration were coded as "1." Those who responded No were coded as "0" as well as those individuals who responded Yes, but reported the incarceration occurred before they were born or after their 18th birthday. Individuals who answered "I don't know," and skipped the item (either legitimately or refused to answer) were coded as missing data (N = 166).

The first step in determining whether parental incarceration has a possibly moderating effect on the relations between juvenile delinquency and adult incarceration was to investigate whether parental incarceration significantly affected offspring's adult incarceration. For both males and females separately, the adult incarceration (AI) variable was regressed on the demographic variables, the scale variables (as presented above), and the PPFi variable. For males, PPFi was significant at $p < .01$ and contributed to the prediction of adult incarceration over and above the contributions of demographic variables and all of the delinquency subscales with $\Delta R^2 = .02$. For females, PPFi was significant at $p < .05$ and $\Delta R^2 = .00$. Table 6 presents the standardized regression coefficients (β) and change in Adjusted R^2 values (based on Adjusted R^2

values from the regressions including the covariates and all three scale scores, presented above) for both males and females for the PPFi variable.

Table 6

Logistic Regression Predicting Adult Incarceration – Including Parental Incarceration

<i>Variable</i>	β	<i>SE</i>	<i>p</i>	<i>Adjusted R²</i>	ΔR^2
PPFI – Males	.16	.02	.00*	.08	.02
PPFI – Females	.06	.02	.01**	.09	.00

* $p < .01$

** $p < .05$

To investigate the possible moderating effect of parental incarceration on the relation between the subtypes of juvenile delinquency and adult incarceration, an interaction was computed for each subscale of delinquency. The interactions were defined by their components. Interaction 1 (Inx 1) was the product of the parental incarceration variable (PPFI) and the MT scale score for each respondent while Interaction 2 (Inx 2) was the product of PPFi and the TPG scale score. Interaction 3 (Inx 3) was the product of PPFi and a respondent's VT scale score. Each interaction was regressed on Adult Incarceration, with the demographic variables (Age, Race, SES), scale scores (MT, TPG, VT), and PPFi as covariates. Separate logistic regressions, using maximum likelihood ratios (MLR), were conducted for each gender. None of the interactions were significant at $p < .01$ or $p < .05$. Tables 7 and 8 display the standardized regression coefficients (β), standardized errors, and p -values for both men and women included in the analyses.

Table 7

Logistic Regression Predicting Reported Adult Incarceration with Parental Incarceration as a Moderating Variable (Men)

	<i>B</i>	<i>SE</i>	<i>p</i>
Inx 1 (PPFI x MT)	.08	.04	.09
Inx 2 (PPFI x TPG)	-.05	.04	.22
Inx 3 (PPFI x VT)	.03	.05	.54

Table 8

Logistic Regression Predicting Reported Adult Incarceration with Parental Incarceration as a Moderating Variable (Women)

	<i>B</i>	<i>SE</i>	<i>p</i>
Inx 1 (PPFI x MT)	.01	.04	.85
Inx 2 (PPFI x TPG)	.02	.04	.56
Inx 3 (PPFI x VT)	.00	.04	.95

CHAPTER V

DISCUSSION

In the current study, I examined the contribution of parental incarceration, occurring during the participants' childhood and adolescence, in predicting adult incarceration rates and the existence of a moderating effect of parental incarceration on the relation between juvenile delinquency and adult incarceration. In order to achieve this objective, I first confirmed a hypothesized factor structure for a widely used measure of delinquency and investigated the relation between factor scores and adult incarceration. Thus, I could eventually examine whether parental incarceration moderated that aforementioned relation.

Factor Analysis of the Delinquency Scale

This study examined the factor structure of the 15-item Delinquency Scale included on all four waves of the Add Health survey (Harris et al., 2009). Specifically, I proposed a 3-factor structure to capture the different types of offending about which participants were questioned. The Minor Transgressions (MT) factor incorporated 6 items that denoted less serious, nonviolent behaviors while the Transgressions for Personal Gain (TPG) factor included five items that captured non-violent behaviors that typically resulted in the monetary gain or the acquisition of physical property. The Violent Transgressions (VT) factor was comprised of three items that probed participants about violent behavior resulting in physical injury to others. The remaining item of the scale was removed from analysis due to empirical and theoretical concerns.

Confirmatory factor analysis supported the existence of the proposed three factor model based on select measures of fit: Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), and the Tucker Lewis Index (TLI). The CFI and TLI, .93 and .91, respectively, were evidence of a marginally good fitting model and the RMSEA (.04) indicated a

good fit (Muthen & Muthen, 2009). All but one of the 14 items included in this analysis had standardized estimates above .5, indicating that the items had sufficient factor loadings onto their proposed factors.

The presence of the different factors allows a closer look at the nature of one's delinquent acts, as captured by the Add Health survey. For example, two participants in the study, Person A and Person B, may both answer affirmatively on 7 of the items on the delinquency scale, leading to the interpretation that both A and B are equally "delinquent." By breaking down the larger Delinquency Scale into these factors, one may observe that 5 out of Person A's responses were on the Minor Transgressions factor, while Person B's affirmative responses were all on the Transgressions for Personal Gain and Violent Transgressions factors. Closer examination of these two participants' delinquency may highlight their differences rather than result in a general categorization of their behaviors.

These findings are in agreement with the Criminal Career Paradigm (Piquero et al., 2003), which argues that there are different types of offending and that the types of crimes that individuals often engage in vary across the lifespan. There is evidence that while offenders, both juvenile and adult, tend to engage in a diversity of crime types, there is a "somewhat greater tendency to repeat the same crime or to repeat with the group of property crimes or the group of violent crimes" (Piquero et al., p.380). The topic of offense specialization (e.g., an offender who commits the same crime multiple times) is a controversial subject, as there are multiple studies to support a more generalist (committing multiple types of crimes) criminal career perspective. Many have argued, however, that prior to dismissing the idea of offense specialization, instruments that are less general and have more robust psychometric properties are necessary, particularly for juvenile populations (Sullivan, McGloin, Caudy, & Ray, 2009).

The investigation of the different factors of the delinquency scale is not meant to support either argument in the debate on generalist versus specialization theories of career criminals. The identification of these factors merely provides more specific information to address the question at hand. In future studies, an analysis of the participants' delinquency factor scores over the different waves (I-III) may provide useful information for the current debate. Generally, offense specialization tends to increase with age (see Blumstein et al. 1986; Le Blanc & Frechette, 1989; Stattin, Magnusson, & Reichel 1989; Piquero et al. 1999), yet research thus far tends to focus on the difference in age between juveniles and adults, as opposed to trends between different ages of juveniles.

Another benefit of identifying different factors on the delinquency scale is that future research using the Add Health dataset which focuses on delinquent and violent behavior can use the factors in their analyses. Researchers looking at specific behaviors can use one of the factor scales as opposed to picking individual items from the delinquency scale that would necessitate separate analyses. Blum, Ireland, and Blum (2003), for example, examined gender differences in juvenile violence using the Add Health data set and in one part of their analyses they used individual items from the delinquency scale (e.g., taking part in a group fight). For studies such as this, the use of the Violent Transgressions factor would afford better measurement, as the factor may add different dimensions of violence without increasing the number of items used in analyses.

Relation between Juvenile Offending and Adult Incarceration

The second aim of this study was to confirm the previously documented relation between juvenile offending and adult incarceration and, specifically, to identify subtypes of delinquency that afforded better prediction. Prior to analyzing this relation, preliminary analyses

demonstrated that gender was the only covariate which significantly affected the dependent variable (adult incarceration) which has been demonstrated in previous research (Moffitt, Caspi, Rutter, & Silva, 2001; Piquero, 2000; Piquero et al., 2003; Silverthorn & Frick, 1999; Steffensmeier & Allan, 1996) and is discussed in greater detail below. Regardless of gender, the results from this study were in agreement with the hypothesis that less serious delinquent behaviors (as captured on the Minor Transgressions, MT, scale) would not predict adult incarceration rates. For both genders, the less violent and potentially more serious juvenile delinquent behaviors (as captured on the Transgressions for Personal Gain, TPG, scale) was a significant predictor of adult incarceration, even when controlling for MT scale behaviors. Finally, the Violent Crime (VT) scale, as was hypothesized, significantly contributed to predicting adult incarceration rates for both genders above and beyond the contributions of MT and TPG scales.

These results address a significant gap in the literature regarding criminal recidivism of adolescents during adulthood, as most studies have been of criminal recidivism during solely adolescence or solely adulthood (Benda, Corwyn, & Toombs, 2001). In their study of “serious offending juveniles” in Arkansas, Benda et al. found that history of prior incarceration was the most significant static predictor of 2-year recidivism. Findings from this study indicate that the behaviors reported on in the VT and TPG factors are those behaviors which, if the subject is caught by law enforcement, are more likely to result in juvenile incarceration, making them similar to the “serious offending juveniles” from Benda et al.’s study. Additionally, the factor scores of the VT and TPG scales significantly contribute, and at a greater magnitude than the MT scale, to predicting adult incarceration.

The identification of a link between juvenile delinquency and adult incarceration provides further evidence for Sampson and Laub's (1993) social control theory of criminality. Those youth who have more serious offenses are also more likely to disrupt social bonds (e.g., feeling connected with school, having close family relationships) which contribute to adult criminality. Additionally, the finding that violent juvenile delinquents are more likely to persist in their criminal careers through adulthood than their less violent counterparts supports the dynamic models of criminal careers and supports the taxonomy of trajectories which delineate between the serious/persisting offenders and less-serious/desisting offenders (Moffitt et al., 2001).

Gender Differences

Previous research has demonstrated strong gender differences in rates of both juvenile delinquency and adult incarceration (Moffitt et al., 2001; Piquero, 2000; Piquero et al., 2003; Silverthorn & Frick, 1999; Steffensmeier & Allan, 1996). A review of the Providence National Collaborative Perinatal Project data by Piquero and Buka (2002), for example, found that 19% of males had court contact by the age of 18, whereas 5% of females had been involved with the court by age 18. In a study of a 1970 Puerto Rico birth cohort, 11.3% of males and 2.3% of females were arrested by the age of 17 (Nevares, Wolfgang, & Tracy, 1990).

Analyses also demonstrated differences between the genders in their factor scores and the contributions of those scores in predicting adult incarceration. For both genders, as mentioned above, TPG and VT factor scores contributed to adult incarceration. For males, the comparison of the changes in R^2 for the TPG and VT factors (.01 and .02, respectively), indicate that the VT factor is a relatively stronger predictor of adult incarceration than the TPG factor. For females,

the inverse is true, as the TPG factor accounted for almost 6% increase in predicting adult incarceration, while the VT factor accounted for just over 1.5% increase in prediction.

These findings are consistent with previous examinations of male and female differences in offending (Jones, Marris, & Hornsby, 1995). Lanctôt and Le Blanc (2002) reported in their review of gender differences in deviance that official data indicates that females become involved with juvenile justice due to status offenses or minor thefts. In an examination of conduct disorder variables (as defined by the DSM-5, American Psychiatric Association, 2013), Keenan, Loeber, and Green (1999) found that violations of rules and physical aggression were more prevalent, severe, and began at younger ages for boys than for girls. Elliot (1994), through close examination of the National Youth Survey (NYS) data, demonstrated that peak age in prevalence for serious and violent offending was actually earlier for females, but the decline was also steeper, resulting in a greater gender differential as participants grew older. Males were consistently more likely than females to be involved in serious and violent offending, but the ratio at which this occurred grew larger with each age group (Elliot, 1994).

In an examination of adult offending, Warren, Hurt, Loper, Bale, Friend, and Chauhan (2002) also demonstrated similar trends. Offenses committed by females were examined in relation to types and severity of psychiatric symptoms in a sample (N = 802) of female felons incarcerated in Virginia. Among other findings, they found that drug-related crimes (or stealing in order to obtain drugs) accounted for 43% of the most serious crimes for which the women in the sample were incarcerated. Only 141 women (18%) were charged with “Violent Offenses” which included murder, robbery, and weapons charges (Warren et al., 2002).

There are varying opinions as to whether self-report data accurately reflects the gender gap in delinquency. Chesney-Lind and Sheldon (1992), for example, argue that self-report data

often attenuate the gender gap. In reality, the proportions of girls and boys involved in problem behaviors (classified as “status offenses” in the justice system) are more equal than unequal, and girls charged with status offenses are significantly overrepresented in the juvenile justice system (Chesney-Lind, 1989; Lanctôt & Le Blanc, 2002). On the other hand, self-report data from the National Youth Survey (Elliott et al., 1989) indicated that significant gender differences exist in all forms of delinquency across the different waves of the study. Self-report data from the Bureau of Justice Statistics from 1999 demonstrated that the male/female ratio for minor thefts was less than 2:1 while the ratio for fights where other individuals were injured was close to 4:1 (Lanctôt & Le Blanc). These self-report findings could be evidence that males demonstrate more acting-out behaviors (such as aggression and violence) while females have less overt behavior problems and more subtle forms of deviance that do not involve harming others (Blum et al., 2003; Piquero et al., 2003).

In summary, the findings from the present study are in agreement with those from Elliott et al. (1989), Lanctôt and Le Blanc (2002), and others who have found gender differences in self-reports of delinquency. For males, the VT factor was a relatively more significant predictor of adult incarceration in comparison to the other factors. For females, the TPG factor contributed relatively more to the prediction of adult incarceration than did the other factors.

Parental Incarceration

The primary aim of this study was to investigate the effects of parental incarceration on the relation between juvenile delinquency and adult incarceration. It was hypothesized that parental incarceration would significantly contribute to the prediction of adult incarceration. It was also hypothesized that parental incarceration would moderate the relation between juvenile delinquency and adult incarceration. Parental incarceration was found to contribute significantly

to adult incarceration predictions, regardless of gender, above and beyond the contributions of the three factor scores.

Studies from several countries have demonstrated that parental criminality predicts children's own criminality, both as children/adolescents and in later life (Benda et al., 2003; Farrington et al., 2001, Fergusson et al., 2000; Glueck & Glueck, 1950; Murray & Farrington, 2005; Piquero et al., 2003). While juvenile delinquency and parental incarceration have both been studied as risk factors for adult incarceration, they have rarely been incorporated into the same study. Benda and colleagues were able to do so, however, when they examined adult recidivism rates of juvenile delinquents (N = 441) in Arkansas. In their study individual discrete (categorical) and dynamic (continuous) variables were analyzed for individual significance on recidivism versus nonrecidivism using Pearson chi squares and *t* tests. Variables which were identified as significant in preliminary analyses included prior incarceration, relationships with parents, and age of first incarceration among others; family incarceration (which included all immediate family members), however, was not significant. A logistic regression was then used to analyze the relative significance of both the discrete and dynamic variables which had been identified as individually significant in the preliminary analyses, and the prior incarceration variable was the most significant risk factor (Benda et al.).

The results of the present study are interesting in comparison to those of Benda et al. (2003). First, parental incarceration was identified to be a significant predictor of adult incarceration in this study, while immediate family member incarceration in the Benda et al. study was not. This may be a result of looking at just parental incarceration in the present analyses as opposed to including siblings in the analyses as was done by Benda et al. Previous research, however, suggests that having multiple immediate family members incarcerated

increases the probability that one will have negative academic outcomes (Nichols & Loper, 2012).

Another interesting area of comparison is in regards to the contributions of parental incarceration and juvenile delinquency. In the present study parental incarceration contributed, albeit a small contribution, to adult incarceration over and above the effects of all three juvenile delinquency factors, while in the Benda et al. study, prior incarceration was the most significant predictor. Similar to the comparison of the parental incarceration and family member incarceration variables, the juvenile delinquency factors and prior incarceration variables in the two studies are not exactly the same.

The effects of parental incarceration on offspring have been researched extensively as incarceration rates have increased (Foster & Hagan, 2013). As mentioned previously, children and adolescents are at greater risk for social, emotional, academic, and physical and mental health outcomes if at least one of their parents is incarcerated (Dallaire & Wilson, 2010; Farrington et al., 2012; Lee, Fang, & Luo, 2013; Murray & Farrington, 2008). Research has also demonstrated that children with a history of parental incarceration are at risk for negative delinquent outcomes (Murray et al., 2010), antisocial behaviors (Murray et al.), and aggressive behaviors (Gellar et al., 2009). No previous study, however, has examined data from a nationally representative study in the U.S., to this writer's knowledge, and identified a link between parental incarcerations during one's youth with adult incarceration when those youths become adults.

When the parental incarceration variable was combined with the various factor scores (MT, TPG, VT) to form an interaction, and adult incarceration was regressed on these interactions, however, there was no evidence that there was a moderating effect. This finding

was not altogether surprising for the MT scale, as previous analyses (see above), demonstrated that for both males and females MT factor scores failed to increase the predictability of adult incarceration. For the TPG and VT factors, which significantly increased the predictability of adult incarceration for both genders, my hypothesis was not confirmed.

There are a few possible explanations for the lack of a moderating effect of parental incarceration on the relation between juvenile delinquency and adult incarceration. The case of a lack of interaction between the VT scale and parental incarceration may be explained by postulates of social control theory (Sampson & Laub, 1993). If a youth is a violent offender, he is more likely to spend a significant amount of time in juvenile detention, placing more strain on his relationship with his parents. If a parent is incarcerated, the offspring already has limited contact with that parent (Poehlmann et al., 2010). The act of the juvenile's incarceration may sever the bond completely, truncating any possible interaction effect of parental incarceration on the relation between violent juvenile offending and adult incarceration.

Another possible explanation can be found in the more recent theories on criminal careers. Developmental theories of criminal trajectories, such as Moffitt et al.'s (2001), posit that regardless of the type of crime a juvenile is involved in or additional risk factors that the juvenile may be exposed to, such as parental incarceration, there are definite trends in offending which depend on the individual's developmental stage. Research in this area has supported the idea that those who are life-course persistent criminals (Moffitt et al.) will commit crimes from late childhood through adolescence and well into adulthood, and those who are adolescence-limited offenders are more likely to desist in criminal activity before they enter young adulthood. These trajectories are not dictated by additive risk factors, but rather developmental changes in the individual's life, such as maturation and becoming less susceptible to peer influences (Piquero, et

al., 2003). Introducing more risk factors will not change the trajectory, but reducing criminogenic needs (dynamic factors which produce crime and are strongly correlated with risk, e.g., peer groups, value system, lack of problem-solving skills) (Lowenkamp & Latessa, 2005) may change long-term outcomes. In accordance with this developmental perspective on criminal trajectories the interactions between juvenile delinquency scales and parental incarceration, which are both risk factors, do not produce significant findings.

Limitations

As with any study, especially those using longitudinal datasets, there are a number of limitations, both statistical and logistical, which need to be taken into account when interpreting the previously presented results. Due to the retrospective nature of the measure, many of the items may be underestimated due to recall bias, lack of awareness/knowledge, and failure to report due to social desirability and stigma (Lee et al., 2013). Other limitations common to large, longitudinal datasets that affected this study include that the dataset was not constructed specifically for this study, thereby limiting the type of information and the manner in which it was gathered. Analyses are conducted post facto as opposed to creating a survey with certain objectives considered a priori. Sample attrition, in addition to exclusion of those who did not respond to every item used, resulted in a loss of approximately 30% of the sample between Wave I and Wave IV. It is likely that the very people who may have been most relevant (e.g., those who are still involved in the criminal justice system but not incarcerated) to the study were those who were not reached, those who were contacted but refused to participate, or those who were unable to participate in Wave IV data collection.

Due to the thoroughness of the Add Health survey (the measure consisted of more than 2,000 items), there were multiple items which captured violent and deviant behaviors that were

not included in these analyses. For example, there is a “Violence Scale” and items on school-focused sections of the survey related to school violence which may have added to the information from the delinquency scale items. These additional items could have been included in factor analyses, especially because some of the VT scale was comprised of only three items, while the literature generally suggests that a scale be comprised of at least five items.

An additional statistical limitation was the difficulty with measuring reliability of the three different scales. While Cronbach’s alpha is a widely used measure of reliability, there has been recent debate as to the efficacy of this measure, especially when there are low item numbers or a wide heterogeneity of constructs (Raykov, 2002 & 2007; Tavakol & Dennick, 2011). Statistical research from the past decade suggests that internal consistency of scales on a factor analysis may be more appropriately measured using an equation for multi-component reliability analysis (Raykov, 2002 & 2007). However, such equations have been devised for use with independent variables that are continuous (5 or more response options for each item), but are not available for factor analyses using categorical independent variables, which applies to the variables in the analyses of the present study. Thus, Cronbach’s alpha was the next best choice for reliability analyses, and unfortunately all three factors (MT, TPG, and VT) had low reliability ratings.

Future analyses may consider including more specific information which the literature is currently focusing on in relation to juvenile delinquency and parental incarceration. For example, much of the research pertaining to developmental trajectories of juvenile delinquents pertains to the age at which youth begin offending, as this has proven to be a marker of the type of criminal a juvenile will or will not become (Piquero et al., 2003). The scope of this study did

not include information regarding the age at which the offspring was when he or his parents were incarcerated, which is a focus of the current research on parental incarceration (Piquero et al.).

Implications and Conclusions

The primary goal of this study was to contribute to two rapidly growing bodies of literature: (1) the connection between juvenile delinquency and offending in later life and (2) the long term effects on children when their parents are incarcerated before their 18th birthday. Current research has focused on the outcomes for juvenile delinquents in later life (Piquero et al., 2003) and the shorter term effects of parental incarceration on children (Murray et al., 2012). This study was the first to use a nationally representative sample to look at the long term effects of juvenile delinquency and parental incarceration together. The results presented above indicate that there may not be a relation between juvenile delinquency and parental incarceration which affects the probability of adult incarceration, above and beyond the sum of their individual contributions. While this main hypothesis was not ultimately validated, the findings leading up to this conclusion are worth further consideration.

This study has confirmed that juvenile delinquency is related to adult incarceration using a nationally representative sample. The link between delinquent behavior and adult incarceration was previously established in a number of studies using smaller populations or samples from abroad (Farrington et al., 2001; Fergusson et al., 2000; Murray et al., 2007; Smith, 1991). Results from this study also confirm that parental incarceration is linked to adult incarceration. Again, no other study has used a nationally representative sample from the U.S. to provide evidence for this relation.

While the confirmation of the relations between juvenile delinquency and parental incarceration with adult incarceration were expected, closer examination of the results reveals a

rather surprising outcome: the contribution of parental incarceration to the prediction of adult incarceration was above and beyond the contribution of all three factors measuring juvenile transgressions. Public policy and opinion tends to focus on rehabilitation, alternative placements, and restitution programs for juvenile delinquents in an effort to derail those delinquents from growing into adult criminals. The findings from this study suggest that resources should be used to support families of incarcerated parents. Interventions are needed to support the children of incarcerated individuals because they have a greater risk for becoming adult criminals than do their counterparts who do not have a parent incarcerated but do commit acts of delinquency.

This finding has social implications as well. Common culture often glorifies criminality amongst youth as seen in popular music, television, clothes, and social media. Research has shown that the opposite is true for having a parent incarcerated; there is significant stigma associated with having an immediate family member incarcerated (Nichols & Loper, 2012). These results contribute to the argument that those who interact with children on a regular basis (e.g., teachers, health professionals, caregivers, peer's parents) should be sensitive to the shame that children with incarcerated parents likely experience.

The results from this study also imply that the Add Health version of the Delinquency Scale can be divided into different scales based on activities and is an adequate measure of juvenile delinquency and rule-violating behaviors. As mentioned above, the measurement of crime in general has been debated over multiple centuries and been approached in different ways (Mosher et al., 2002). The results from this study suggest that further investigation into the psychometric properties of the Delinquency Scale continue and a more detailed examination of the items (e.g., answers across the different waves, age of onset of delinquency etc.) would also contribute to this research. In the meantime, however, the 15-item version of the Elliot et al.

(1985) self-report Delinquency Scale can be added to the limited number of instruments aimed at capturing information about delinquency behaviors for youth.

In summary, the results from this study have contributed to the research both on the measurement of crime and the avenues in which future resources may prove most effective. It is of paramount importance that society begins to focus less on intervening to change delinquents' trajectory into adult incarceration. Rather, the emphasis should be placed on the prevention of delinquency in youth. As extrapolated from the results of this current study, one way to accomplish this task is to recognize the larger collateral costs of incarcerating parents.

REFERENCES

- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Benda, B.B., Corwyn, R.F., & Toombs, N.J. (2001). Recidivism among adolescent serious offenders: Prediction of entry into the correctional system for adults. *Criminal Justice and Behavior*, 28, 588-613 . doi: 10.1177/009385480102800503
- Bowlby, J. (1973). *Separation: Anxiety and anger*. New York: Basic Books.
- Blum, J., Ireland, M., & Blum., R.W. (2003). Gender differences in juvenile violence: A report from Add Health. *Journal of Adolescent Health*, 32, 234-240. doi: 10.1016/S1054-139X(02)00448-2
- Blumstein, A., Cohen, J., Das, S., & Moitra, S. (1988). Specialization and seriousness during adult criminal careers. *Journal of Quantitative Criminology*, 4, 303-345.
- Blumstein, A., Cohen, J., Roth, J.A., & Visher, C.A. (Eds.) (1986). *Criminal careers and "career criminals"* (2 Vols.). Panel on Research on Career Criminals, Committee on Research on Law Enforcement and the Administration of Justice, Commission on Behavioral and Social Sciences and Education, National Research Council. Washington, D.C.: National Academy Press.
- Bridges, G.S. (1987). An empirical study of error in reports of crime and delinquency. In M.W. Wolfgang, T.P. Thornberry, & R.M. Figlio (Eds.), *From boy to man, from delinquency to crime* (pp. 180-194). Chicago: University of Chicago Press.
- Britt, C.L. (1992). Constancy and change in the U.S. age distribution of crime: A test of the 'Invariance Hypothesis.' *Journal of Quantitative Criminology*, 8, 175-187. doi: 10.1007/BF01066743

- Bursik, R.J. (1980). The dynamics of specialization in juvenile offenses. *Social Forces*, 58, 851-864. doi: 10.2307/2577188
- Chesney-Lind, M. (1989). Girls' crime and woman's place: Toward a feminist model of female delinquency. *Crime and Delinquency*, 35, 5-29. doi:10.1177/0011128789035001002
- Chesney-Lind, M., & Shelden, R.G. (1992). *Girls, delinquency and juvenile justice*. Pacific Grove, A: Brooks/Cole.
- Clear, T.R., Rose, D.R., Waring, E., & Scully, K. (2003). Coercive mobility and crime: Incarceration and social disorganization. *Justice Quarterly*, 20, 33-64. doi:10.1080/07418820300095451
- Dallaire, D.H., & Wilson, L. (2010). The relation of exposure to parental criminal activity, arrest, and sentencing to children's maladjustment. *Journal of Child and Family Studies*, 19, 404-418. doi: 10.1007/s10826-009-9311-9
- Deane, G., Armstrong, D.P., & Felson, R.B. (2005). An examination of offense specialization using marginal logit models. *Criminology*, 43, 955-988. doi: 10.1111/j.1745-9125.2005.00030.x
- Doherty, E.E., Laub, J.H., & Sampson, R.J. (2009). Group-based trajectories in life course criminology. In G.H. Elder, Jr. & J.Z. Giele (Eds.), *The craft of life course research* (pp. 187-210). New York; The Guilford Press.
- Elliott, D.S. (1976). National Youth Survey. Boulder, CO: Inter-University Consortium for Political and Social Research.
- Elliott, D.S. (1994). Serious violent offenders: Onset, developmental course, and termination. *Criminology*, 32, 1-22. doi: 10.1111/j.1745-9125.1994.tb01144x

- Elliott, D.S., & Ageton, D.S. (1980). Reconciling race and class differences in self-reported and official estimates of delinquency. *American Sociological Review*, *45*, 95-110.
- Elliott, D.S., Ageton, S.S., & Huizinga, D. (1985). *Explaining delinquency and drug use*. Beverly Hills, CA: Sage.
- Elliott, D.S., Huizinga, D., & Menard, S. (1989). *Multiple problem youth: Delinquency, substance use, and mental health problems*. New York: Springer.
- Elliott, D. S., Huizinga, D., & Morse, B. (1986). Self-reported violent offending: A descriptive analysis of juvenile violent offenders and their offending careers. *Journal of Interpersonal Violence*, *1*, 472-514.
- Esbensen, F.A., & Osgood, D.W. (1999). Gang resistance education and training (GREAT): Results from the national evaluation. *Journal of Research in Crime and Delinquency*, *36*, 194-225. doi: 10.1177/0022327899036002004
- Farrington, D.P. (1989). Early predictors of adolescent aggression and adult violence. *Violence and Victims*, *4*, 79-100.
- Farrington, D.P. (1991). Childhood aggression and adult violence: Early precursors and later life outcomes. In D.J. Pepler & K.H. Rubin (Eds.), *The development and treatment of childhood aggression*. Hillsdale, NJ: Lawrence Erlbaum.
- Farrington, D.P. (2002). Families and crime. In J.Q. Wilson & J. Petersilia (Eds.), *Crime: Public policies for crime control* (pp. 129-148). Oakland, CA: Institute for Contemporary Studies Press.
- Farrington, D.P., Jolliffe, D., Loeber, R., Stouthamer-Loeber, M., & Kalb, L.M. (2001). The concentration of offenders in families, and family criminality in the prediction of boys' delinquency. *Journal of Adolescence*, *24*, 579-596. doi: 10.1006/jado.2001.0424

- Farrington, D.P., Loeber, R., & Stouthamer-Loeber, M. (2003). How can the relationship between race and violence be explained? In D.F. Hawkins (Ed.), *Violent crime: Assessing race and ethnic differences* (pp. 213-237). Cambridge, UK: Press Syndicate of the University of Cambridge.
- Farrington, D.P., Loeber, R., Stouthamer-Loeber, M., van Kammen, W.B., & Schmidt, L. (1996). Self-reported delinquency and a combined delinquency seriousness scale based on boys, mothers, and teachers: Concurrent and predictive validity for African-Americans and Caucasians. *Criminology*, *34*, 493-517. doi: 10.1111/j.1745-9125.1996.tb01217.x
- Farrington, D.P., Snyder, H.N., & Finnegan, T.A. (1988). Specialization in juvenile court careers. *Criminology*, *26*, 461-488. doi: 10.1111/j.1745-9125.1988.tb00851.x
- Fergusson, D.M., Horwood, L.J., & Nagin, D.S. (2000). Offending trajectories in a New Zealand birth cohort. *Criminology*, *38*, 525-552. doi: 10.1111/j.1745-9125.2000.tb00898.x
- Foster, H., & Hagan, J. (2013). Maternal and paternal imprisonment in the stress process. *Social Science Research*, *42*, 650-669. doi: 10.1016/j.ssresearch.2013.01.008
- Fox, C.M., & Jones, J.A. (1998). Uses of Rasch modeling in counseling psychology research. *Journal of Counseling Psychology*, *45*, 30-45. doi: 10.1037/0022-0167.45.1.30
- Gault-Sherman, M. (2012). It's a two-way street: The bidirectional relationship between parenting and delinquency. *Journal of Youth and Adolescence*, *41*, 121-145. doi: 10.1007/s10964-011-9656-4
- Geller, A., Cooper, C.E., Garfinkel, I., Schwartz-Soicher, O., & Mincy, R.B. (2012). Beyond absenteeism: Father incarceration and child development. *Demography*, *49*, 49-76. doi: 10.1007/s13524-011-0081-9

- Geller, A., Garfinkel, I., Cooper, C.E., & Mincy, R.B. (2009). Parental incarceration and child wellbeing: Implications for urban families. *Social Science Quarterly*, *90*, 1186-1202. doi: 10.1111/j.1540-6237.2009.00653.x
- Geller, A., Garfinkel, I., & Western, B. (2011). Incarceration and support for children in fragile families. *Demography*, *48*, 25-47. doi: 10.1007/s13524-010-0009-9
- Glaze, L.E. (2010). *Correctional populations in the United States, 2009*. Washington, DC: Bureau of Justice Statistics.
- Glaze, L.E., & Maruschak, L.W. (2008). *Bureau of Justice statistics special report: Parents in prison and their minor children*. Washington, DC: Bureau of Justice Statistics.
- Glueck, S., & Glueck, E. (1950). *Unraveling juvenile delinquency*. New York: Commonwealth Fund.
- Gottfredson, M.R., & Hirschi, T. (1986). The true value of lambda would appear to be zero: An essay on career criminals, criminal careers, selective incapacitation, cohort studies, and related topics. *Criminology*, *24*, 13-24. doi: 10.1111/j.1745-9125.1986.tb01494.x
- Gottfredson, M.R., & Hirschi, T. (1987). The methodological adequacy of longitudinal research on crime. *Criminology*, *25*, 581-614. doi: 10.1111/j.1745-9125.1987.tb00812.x
- Gottfredson, M.R., & Hirschi, T. (1988). Science, public policy, and the career paradigm. *Criminology*, *26*, 37-55. doi: 10.1111/j.1745-9125.1988.tb00830.x
- Gottfredson, M.R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- Greenberg, D. F. (1974). The incapacitative effect of imprisonment: Some estimates. *Law and Society Review*, *9*, 541-580. doi: 10.2307/3053339

- Greenbaum, P., & Dedrick, R.F. (1998). Hierarchical confirmatory analysis of the Child Behavior Checklist, 4-18. *Psychological Assessment, 10*, 149-155. doi: 10.1037/1040-3590.10.2.149
- Guo, G., Roettger, M.E., & Shih, J.C. (2007). Contributions of the *DAT1* and *DRD2* genes to serious and violent delinquency among adolescents and young adults. *Human Genetics, 121*, 125-136. doi: 10.1007/s00439-006-0244-8
- Hagan, J., & Dinovitzer, R. (1999). Collateral consequences of imprisonment for children, communities, and prisoners. In M. Tonry & J. Petersilia (Eds.), *Crime and justice: A review of research: Prisons* (Vol. 26, pp. 121-162). Chicago IL: University of Chicago Press.
- Harris, K.M., Halpern, C.T., Whitsel, E., Hussey, J., Tabor, J., Entzel, P., & Udry, J.R. (2009). The National Longitudinal Study of Adolescent Health: Research Design. Retrieved 11/29/2011 from <http://www.cpc.unc.edu/projects/addhealth/design>
- Haynie, D.L. (2001). Delinquent peers revisited: Does network structure matter? *American Journal of Sociology, 106*, 1013-1057. doi: 10.1086/320298
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley, CA: University of California Press.
- Horney, J.D., Osgood, W., & Marshall, I.H. (1995). Criminal careers in the short-term: Intra-individual variability in crime and its relation to local life circumstances. *American Sociological Review, 60*, 655-673. doi: 10.2307/2096316
- Hoeve, M., Dubas, J.S., Eichelsheim, V.I., van der Laan, P.H., Smeenk, W., & Gerris, J.R.M. (2009). The relationship between parenting and delinquency: A meta-analysis. *Journal of Abnormal Child Psychology, 37*, 749-775. doi: 10.1007/s10802-009-9310-8

- Hoeve, M., Smeenk, W.H., Loeber, R., Stouthamer-Loeber, M., van der Laan, P.H., Gerris, J.R.M., et al. (2007). Long term effects of parenting and family characteristics on delinquency of male young adults. *European Journal of Criminology*, 4, 116-194. doi: 10.1177/1477370807074854
- Huebner, B.M., & Gustafson, R. (2007). The effect of maternal incarceration on adult offspring involvement in the criminal justice system. *Journal of Criminal Justice*, 34, 283-296. doi: 10.1016/j.jcrimjus.2007.03.005
- Huesmann, L.R., Eron, L.D., Lefkowitz, M.M., & Walder, L.O. (1984). Stability of aggression over time and generations. *Developmental Psychology*, 20, 1120-1134. doi: 10.1037/0012-1649.20.6.1120
- Huizinga, D. (1991). Assessing violent behavior with self-reports. In J.S. Milner (Ed.), *Neuropsychology of aggression* (pp. 47-66). Boston: Kluwer Academic.
- Huizinga, D., & Elliot, D.S. (1986). Reassessing the reliability and validity of self-report delinquency measures. *Journal of Quantitative Criminology*, 2, 293-327.
- Huizinga, D., & Elliott, D. S. (1987). Juvenile offenders: Prevalence, offender incidence, and arrest rates by race. *Crime and Delinquency*, 33(2), 206-223.
- Huizinga, D., Esbensen, F.A., & Weiher, A.W. (1991). Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology*, 82, 83-118.
- Hurley, A.E., Scandura, T.A., Shriesheim, C.A., Brannick, M.T., Seers, A., Vandenberg, R.J., & Williams, L.J. (1997). Exploratory and confirmatory factor analysis: Guidelines, issues, and alternatives. *Journal of Organizational Behavior*, 18, 667-683. doi: 10.1002/(SICI)1099-1379(199711)18:6<667::AID-JOB874>CO;2-T

- Jones, I. H., Marris, B., & Hornsby, H. (1995). Psychiatric characteristics of female prisoners in Tasmania. *Australian and New Zealand Journal of Psychiatry*, 29, 671-677.
- Katsiyannis, A., Zhang, D., Barrett, D.E., & Flaska, T. (2004). Background and psychosocial variables associated with recidivism among adolescent males: A 3-year investigation. *Journal of Emotional and Behavioral Disorders*, 12, 23-29. doi: 10.1177/10634266040120010301
- Keenan, K., Loeber, R., & Green, S. (1999). Conduct disorder in girls: A review of the literature. *Clinical Child and Family Psychology Review*, 2, 3-19. doi: 10.1023/A:1021811307364
- Kempf, K.L. (1987). Specialization and the criminal career. *Criminology*, 25, 399-417. doi: 10.1111/j.1745-9125.1987.tb00803.x
- Klein, M.W. (1984). Offense specialization and versatility among juveniles. *British Journal of Criminology*, 24, 85-194.
- Lanctôt, N., & Le Blanc, M. (2002). Explaining deviance by adolescent females. *Crime and Justice*, 29, 113-202.
- Lowenkamp, C. T., & Latessa, E. J. (2005). Increasing the effectiveness of correctional programming through the risk principle: Identifying offenders for residential placement. *Criminology & Public Policy*, 4, 263-290. doi:10.1111/j.1745-9133.2005.00021.x
- Lattimore, P.K., Visher, C.A., & Linster, R.L. (1994). Specialization in juvenile careers: Markov results for a California cohort. *Journal of Quantitative Criminology*, 10, 291-316. doi: 10.1007/BF02221278
- Laub, J.H., Nagin, D.S., & Sampson, R.J. (1998). Good marriages and trajectories of change in criminal offending. *American Sociological Review*, 63, 225-238. doi: 10.2307/2657324

- Laubacher, A. (2010). Adolescent delinquency as precursor to adult violent offending: A prospective study of a representative sample of Swiss men. *European Psychiatry, 25*, 687. doi: 10.1016/S0924-9338(10)70681-7
- Lauristen, J.L. (1998). The age-crime debate: Assessing the limits of longitudinal self-report data. *Social Forces, 77*, 125-155.
- Le Blanc, M., & Frechette, M. (1989). *Male criminal activity from childhood through youth: Multilevel and developmental perspectives*. New York: Springer.
- Lee, R.D., Fang, X., & Luo, F. (2013). The impact of parental incarceration on the physical and mental health of young adults. *Pediatrics, 131*, e1188-e1195. doi: 10.1542/peds.2012-0627
- Lindquist, C., & Bir, A. (2008). *The national evaluation of the responsible fatherhood, marriage and family strengthening grants for incarcerated and re-entry fathers and their partners: Program overview and evaluation summary (ASPE Research Brief)*. Washington, DC: U.S. Department of Health and Human Services.
- Loeber, R., Farrington, D.P., Stouthamer-Loeber, M., Moffit, T.E., & Caspi, A. (1998). The development of male offending: Key findings from the first decade of the Pittsburgh Youth Study. *Studies on Crime and Crime Prevention, 7*, 141-172.
- Loeber, R., & Stouthamer-Loeber, M. (1986). Family factors as correlates and prediction of juvenile conduct problems and delinquency. *Crime and Justice, 7*, 29-149. doi: 10.1086/449112
- Lynch, M., Buckman, J., & Krenske, L. (2003). Youth justice: Criminal trajectories. *Trends and issues in crime and criminal justice, 265*.

- Maruschak, L., Glaze, L., & Mumola, C. (2010). Incarcerated parents and their children: Findings from the Bureau of Justice Statistics. In M. Eddy & J. Poehlmann (Eds.), *Children of parents in prison: A handbook for researchers and practitioners* (pp. 33-51). Washington, DC: Urban Institute Press.
- Matthews, J. (1983). *Forgotten victims: How prison affects the family*. London, England: National Association for the Care and Resettlement of Offenders.
- Miller, S., Malone, P.S., & Dodge, K.A. (2010). Developmental trajectories of boys' and girls' delinquency: Sex differences and links to later adolescent outcomes. *Journal of Abnormal Child Psychology*, 38, 1021-1032. doi: 10.1007/s10802-010-9430-1
- Moffitt, T.E. (1993). 'Life-Course-Persistent' and 'Adolescence-Limited' antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674-701. doi: 10.1037/0033-295X.100.4.674
- Moffitt, T.E., Caspi, A., Rutter, M., & Silva, P.A. (2001). *Sex differences in antisocial behavior: Conduct disorder, delinquency, and violence in the Dunedin Longitudinal Study*. Cambridge: Cambridge University Press
- Mosher, C.J., Miethe, T.D., & Phillips, D.M. (2002). *The mismeasure of crime*. Thousand Oaks, CA: Sage Publications.
- Murray, J., & Farrington, D.P. (2005). Parental imprisonment: Effects on boys' antisocial behavior and delinquency through the life-course. *Journal of Child Psychology and Psychiatry*, 46, 1269-1278. doi: 10.1111/j.1469-7610.2005.01433.x
- Murray, J., & Farrington, D. P. (2008). The effects of parental imprisonment on children. In M. Tony (Ed.), *Crime and justice: A review of research* (Vol. 37, pp. 133-206). Chicago: University of Chicago Press.

- Murray, J., Farrington, D.P., & Sekol, I. (2012). Children's antisocial behavior, mental health, drug use, and educational performance after parental incarceration: A systematic review and meta-analysis. *Psychological Bulletin, 138*, 175-210. doi: 10.1037/a0026407
- Murray, J., Farrington, D.P., Sekol, L., & Olsen, R. (2009). Effects of parental imprisonment on child antisocial behavior and mental health: A systematic review. *Campbell Systematic Reviews, 4*, doi: 10.4073-csr.2009.4.
- Murray, J., Janson, C.G., & Farrington, D.P. (2007). Crime in adult offspring of prisoners: A cross-national comparison of two longitudinal samples. *Criminal Justice and Behavior, 34*, 133-151. doi: 10.1177/0093854806289549
- Murray, J., & Murray, L. (2010). Parental incarceration, attachment and child psychopathology. *Attachment & Human Development, 12*, 289-309. doi: 10.1080/14751790903416889
- Muthen, L.K., & Muthen, B.O. (2009). *Mplus user's guide* (5th ed.). Los Angeles, CA: Muthen & Muthen.
- Myner, J., Santman, J., Cappelletty, G.G., & Perlmutter, B.F. (1998). Variables related to recidivism among juvenile offenders. *International Journal of Offender Therapy and Comparative Criminology, 42*, 65-80. doi: 10.1177/0306624X9821006
- Nagin, D.S., & Land, K.C. (1993). Age, criminal careers, and population heterogeneity: Specification and estimation of a nonparametric, mixed Poisson model. *Criminology, 31*, 327-362. doi: 10.1111/j.1745-9125.1993.tb01133.x
- Nagin, D., & Tremblay, R.E. (1999). Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and nonviolent juvenile delinquency. *Child Development, 70*, 1181-1196. doi: 10.1111/1467-8624.00086

- Niarhos, F.J., & Routh, D.K. (1992). The role of clinical assessment in the juvenile court: Predictors of juvenile dispositions and recidivism. *Journal of Clinical Child Psychology, 21*, 151-159. doi: 10.1207/s15374424jccp2102_7
- Nichols, E. B., & Loper, A. B. (2012). Incarceration in the household: Academic outcomes of adolescents with an incarcerated household member. *Journal of Youth and Adolescence, 41*(11), 1455-1471. doi:10.1007/s1094-012-9780-9
- Nevarés, D., Wolfgang, M.E., & Tracy, P.E. (1990). *Delinquency in Puerto Rico: The 1970 birth cohort study*. New York: Greenwood
- Osborn, S.G., & West, D.J. (1979). Conviction records of fathers and sons compared. *British Journal of Criminology, 19*, 120-133.
- Osgood, D.W., Johnston, L.D., O'Malley, P.M., & Bachman, J.G. (1988). The generality of deviance in late adolescence and early adulthood. *American Sociological Review, 53*, 81-93. doi: 10.2307/2095734
- Peeples, F., & Loeber, R. (1994). Do individual factors and neighborhood context explain ethnic differences in juvenile delinquency? *Journal of Quantitative Criminology, 10*, 141-157. doi: 10.1007/BF02221156
- Petersilia, J. (2003). *When prisoners come home: Parole and prisoner reentry*. Oxford, England: Oxford University Press.
- Piquero, A.R. (2000). Frequency, specialization and violence in offending careers. *Journal of Research in Crime and Delinquency, 37*, 392-418. doi: 10.1177/0022427800037004003
- Piquero, A.R., Buka, S.L. (2002). Linking juvenile and adult patterns of criminal activity in the Providence cohort of the National Collaborative Perinatal Project. *Journal of Criminal Justice, 30*, 1-14. doi: 10.1016/S0047-2352(02)00128-9

- Piquero, A.R., Farrington, D.P., & Blumstein, A. (2003). The criminal career paradigm. *Crime and Justice*, 30, 359-506.
- Piquero, A.R., MacDonald, J., & Parker, K.E. (2002). Race, local life circumstances, and criminal activity over the life-course. *Social Science Quarterly*, 83, 654-670. doi: 10.1111/1540-6237.00107
- Piquero, A.R., Macintosh, R., & Hickman, M. (2002). The validity of self-reported delinquency scale: Comparisons across gender, age, race and place of residence. *Sociological Methods & Research*, 30, 492-592 .doi: 10.1177/0049124102030004002
- Piquero, A.R., Paternoster, R., Mazerolle, P., Brame, R., & Dean, C.W. (1999). Onset age and offense specialization. *Journal of Research in Crime and Delinquency*, 36, 275-299. doi: 10.1177/0022427899036003002
- Poehlmann, J. (2005). Representations of attachment relationships in children of incarcerated mothers. *Child development*, 76, 679-696. doi: 10.1111/j.1467-8624.2005.00871.x
- Poehlmann, J., Dallaire, D., Loper, A.B., & Shear, L.D. (2010). Children's contact with their incarcerated parents: Research findings and recommendations. *American Psychologist*, 65, 575-598. doi: 10.1037/a0020279
- Poehlmann, J., Park, J., Bouffiou, L., Abrahams, J., Schlafer, R., & Hahn, E. (2008). Representations of family relationships in children living with custodial grandparents. *Attachment and Human Development*, 10, 165-188. doi: 10.1080/14616730802113695
- Raykov, T. (2002). Analytic estimation of standard error and confidence interval for scale reliability. *Multivariate Behavioral Research*, 37(1), 89-103. doi: 10.1207/S15327906MBR3701_04

- Raykov, T. (2007). Longitudinal analysis with regressions among random effects: A latent variable modeling approach. *Structural Equation Modeling, 14*(1), 146-169.
doi:10.1207/s15328007sem1401_8
- Roettger, M.E., & Swisher, R.R. (2011). Associations of fathers' history of incarceration with sons' delinquency and arrest among Black, White, and Hispanic males in the United States. *Criminology, 49*, 1109-1147. doi: 10.1111/j.1745-9125.2011.00253.x
- Rowe, A.R., & Tittle, C.R. (1977). Life cycle changes and criminal propensity. *Sociological Quarterly, 18*, 223-236. doi: 10.1111/j.1533-8525.1977.tb01409.x
- Rutter, M., & Giller, H. (1984). *Juvenile delinquency: Trends and perspectives*. New York: Guilford Publications.
- Sabol, W.J., & West, H.C. (2010). *Prisoners in 2009*. Washington, DC: U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.
- Sampson, R.J., & Laub, J.H. (1993). *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press.
- Sampson, R. J., & Laub, J. H. (1997). A life-course theory of cumulative disadvantage and the stability of delinquency. *Developmental Theories of Crime and Delinquency, 7*, 133-161.
- Shaw, R. (1992). Imprisoned fathers and orphans of justice. In R. Shaw (Ed.), *Prisoners' children: What are the issues?*(pp. 41-49). London, England: Routledge.
- Short Jr., J.F., & Nye, F.I. (1957). Reported behavior as a criterion of deviant behavior. *Social Problems, 5*, 207-213. doi: 10.1525/sp.1957.5.3.03a00050
- Short, J. F., & Nye, F. I. (1958). Extent of unrecorded juvenile delinquency: tentative conclusions. *The Journal of Criminal Law, Criminology, and Police Science, 49*, 296-302.

- Silverthorn, P., & Frick, P. J. (1999). Developmental pathways to antisocial behavior: The delayed-onset pathway in girls. *Development and psychopathology, 11*, 101-126. doi:10.1017/S0954579499001972
- Smith, W.R. (1991). *Project Metropolitan Research Report No. 33: Social structure, family structure, child rearing, and delinquency: Another look*. Stockholm, Sweden: Department of Sociology, University of Stockholm.
- Sroufe, L.A. (1988). The role of infant-caregiver attachment in development. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 18-40). Hillsdale, NJ: Lawrence Erlbaum.
- Stattin, H., & Magnusson, D. (1989). The role of early aggressive behavior in the frequency, seriousness, and types of later crime. *Journal of Consulting and Clinical Psychology, 57*, 710-718. doi:10.1037/0022-006X.57.6.710
- Steffenmeister, D., & Allan, E. (1996). Gender and crime: Toward a gendered theory of female offending. *Annual Review of Sociology, 22*, 459-487. doi:10.1146/annurev.soc.22.1.459
- Steffenmeister, D.J., Allan, E.A., Harer, M.D., & Streifel, C. (1989). Age and the distribution of crime. *American Journal of Sociology, 94*, 803-831. doi: 10.1086/229069
- Sullivan, C.J., McGloin, J.M., Caudy, M., & Ray, J. (2009). Detecting specialization in offending: Comparing analytic approaches. *Journal of Quantitative Criminology, 25*, 419-441. doi:10.1007/s10940-009-9074-x
- Swisher, R.R., & Waller, M.R. (2008). Confining fatherhood: Incarceration and paternal involvement among nonresident White, African American, and Latino fathers. *Journal of Family Issues, 29*, 1067-1088. doi: 10.1177/0192513X08316273

- Taifa, N., & Beane, C. (2009). Integrative solutions to interrelated issues: A multidisciplinary look behind the cycle of incarceration. *Harvard Law & Policy Review*, 3, 283-306.
- Tavakol, M., & Dennick, R. (1991). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53-55. doi: 10.5116/ijme.4dfb.8dfd
- Thornberry, T.P., Krohn, M.D., Lizotte, A.J., & Chard-Wierschem, D. (1993). The role of juvenile gangs in facilitating delinquent behavior. *Journal of Research in Crime and Delinquency*, 30, 55-87. doi: 10.1177/0022427893030001005
- Tittle, C.R. (1988). Two empirical regularities (maybe) in search of an explanation: Commentary on the age/crime debate. *Criminology*, 26, 75-85. doi: 10.1111/j.1745-9125.1988.tb00832.x
- Tittle, C.R., & Grasmick, H.G. (1997). Criminal behavior and age: A test of three provocative hypotheses. *Journal of Criminal Law and Criminology*, 88, 309-342. doi: 10.2307/1144079
- Tracy, P.E., & Kempf-Leonard, K. (1996). *Continuity and discontinuity in criminal careers*. New York: Plenum.
- Travis, J., & Waul, M. (Eds.) (2003). Prisoners once removed: The children and families of prisoners. In J. Travis & M. Waul (Eds.), *Prisoners once removed: The impact of incarceration and reentry on children, families, and communities* (pp.1-29). Washington, DC: Urban Institute.
- Visher, C.A., & Travis, J. (2003). Transitions from prison to community: Understanding individual pathways. *Annual Review of Sociology*, 29, 89-113. doi: 10.1146/annurev.soc.29.010202.095931

- Walmsley, R. (2009). *World prison population list* (8th ed.). London, England: International Centre for Prison Studies, Kings College London.
- Warren, J. I., Hurt, S., Loper, A. B., Bale, R., Friend, R., & Chauhan, P. (2002). Psychiatric symptoms, history of victimization, and violent behavior among incarcerated female felons: An American perspective. *International Journal of Law and Psychiatry*, 25(2), 129-149.
- Western, B. (2006). *Punishment and inequality in America*. New York: Russell Sage Foundation.
- Wilbur, M.B., Marani, J.E., Appugliese, D., Woods, R., Siegel, J.A., Sabral, H.J., & Frank, D. (2007). Socioemotional effects of fathers' incarceration on low-income, urban, school-aged children. *Pediatrics*, 130, e678-e685. doi: 10.1542/peds.2006-2166
- Wildeman, C. (2010). Paternal incarceration and children's physically aggressive behaviors: Evidence from the Fragile Families and Child Wellbeing Study. *Social Forces*, 89, 285-309. doi: 10.1353/sof.2010.0055
- Wyner, G.A. (1981). Response errors in self-reported number of arrests. In G.W. Bohrnstedt & E.F. Borgatta (Eds.), *Social measurement* (pp. 169-85). Beverly Hills, CA: Sage.

Appendix A: Demographic Variables

Wave I	
Interviewer Observations & In-Home Questionnaire	
<i>Item</i>	<i>Response</i>
<i>Gender (Section A: Setup of CAPI Interview)</i>	
<i>Interviewer:</i> Please confirm that R's sex is (male) female. (Ask if necessary)	Male/Female
<i>Race (Section 1: General Introductory)</i>	
4. Are you of Hispanic or Latino origin? 6. What is your race?	Yes/No White Black American Indian or Native American Asian or Pacific Islander Other
<i>Socioeconomic Status (Section 14: Resident Mother)</i>	
9. Does she (resident mother) receive public assistance, such as welfare?	Yes/No
<i>Socioeconomic Status (Section 15: Resident Father)</i>	
9. Does he (resident father) receive public assistance, such as welfare?	Yes/No

Appendix B: Delinquency Scale

Wave I, Section 29**In-Home Questionnaire - ACASI****Delinquency Scale**

*In the past 12 months, how often did you ...

1. paint graffiti or signs on someone else's property or in a public place?
2. deliberately damage property that didn't belong to you?
3. lie to your parents or guardians about where you had been or whom you were with?
4. take something from a store without paying for it?
5. get into a serious physical fight?
6. hurt someone badly enough to need bandages or care from a doctor or a nurse?
7. run away from home?
8. drive a car without its owner's permission?
9. steal something worth more than \$50?
10. go into a house or building to steal something?
11. use or threaten to use a weapon to get something from someone?
12. sell marijuana or other drugs?
13. steal something worth less than \$50?
14. take part in a fight where a group of your friends was against another group?
15. act loud, rowdy, or unruly in a public place?

*Possible answer choices: Never, 1 or 2 times, 3 or 4 times, 5 or more times, Refused, Don't Know, Not Applicable

Appendix C: Adult Incarceration

Wave IV, Section 22	
In-Home Interview	
Involvement with Criminal Justice System	
<i>Item</i>	<i>Response</i>
25. Since your 18 th birthday, about how much total time have you spent in jail or prison? Years: Months:	Continuous

Appendix D: Parental Incarceration

Wave IV: Section 2	
In-Home Interview	
Parental Support and Relationships	
<i>Item</i>	<i>Response</i>
3. (Has/did) your biological mother ever (spent/spend) time in jail or prison?	Yes/No
5. How old were you when your biological mother went to jail or prison (the first time)?	Continuous
6. How old were you when your biological mother was released from jail or prison (most recently)?	Continuous
9. (Has/did) your biological father ever (spent/spend) in jail or prison?	Yes/No
11. How old were you when your biological father went to jail or prison (the first time)?	Continuous
12. How old were you when your biological father was released from jail or prison (most recently)?	Continuous
16. (Has/did) your (mother figure) ever (spent/spend) time in jail or prison?	Yes/No
18. How old were you when your (mother figure) went to jail or prison (the first time)?	Continuous
19. How old were you when your (mother figure) was released from jail or prison (most recently)?	Continuous
30. (Has/did) your (father figure) ever (spent/spend) time in jail or prison?	Yes/No
32. How old were you when your (father figure) went to jail or prison (the first time)?	Continuous
33. How old were you when your (father figure) was released from jail or prison (most recently)?	Continuous

Appendix E: Correlational Matrix for Three Factor Structure of Delinquency Scale

	<i>DS1</i>	<i>DS2</i>	<i>DS3</i>	<i>DS4</i>	<i>DS5</i>	<i>DS6</i>	<i>DS7</i>	<i>DS8</i>	<i>DS9</i>	<i>DS10</i>	<i>DS11</i>	<i>DS12</i>	<i>DS14</i>	<i>DS15</i>
<i>DS1</i>	1.00													
<i>DS2</i>	.57	1.00												
<i>DS3</i>	.32	.32	1.00											
<i>DS4</i>	.52	.53	.28	1.00										
<i>DS5</i>	.30	.30	.16	.27	1.00									
<i>DS6</i>	.32	.32	.17	.29	.61	1.00								
<i>DS7</i>	.38	.39	.21	.35	.20	.21	1.00							
<i>DS8</i>	.40	.41	.22	.37	.31	.33	.26	1.00						
<i>DS9</i>	.57	.57	.31	.52	.44	.47	.38	.49	1.00					
<i>DS10</i>	.53	.53	.29	.48	.40	.43	.35	.46	.64	1.00				
<i>DS11</i>	.55	.55	.30	.50	.42	.45	.37	.48	.67	.62	1.00			
<i>DS12</i>	.48	.48	.26	.43	.37	.39	.32	.41	.58	.54	.56	1.00		
<i>DS14</i>	.31	.31	.19	.28	.59	.63	.21	.32	.45	.42	.44	.38	1.00	
<i>DS15</i>	.39	.39	.21	.35	.20	.21	.26	.27	.38	.35	.37	.32	.21	1.00

Curry Programs in Clinical and School Psychology
Curry School of Education
University of Virginia
Charlottesville, VA

APPROVAL OF THE DISSERTATION

This dissertation, “The Relation of Juvenile Delinquency and Adult Incarceration: Does Parental Incarceration Really Matter?,” has been approved by the Graduate Faculty of the Curry School of Education in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Ann Booker Loper, Ph.D., Committee Chair

Peter L. Sheras, Ph.D., Committee Member

Ronald Reeve, Ph.D., Committee Member

Timothy Konold, Ph.D., Committee Member