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Assessing racial differences in offending trajectories: A life-course view of the race-crime relationship

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Assessing racial differences in offending trajectories:

A life-course view of the race-crime relationship

by

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A dissertation submitted in partial fulfillment
of requirements for the degree of
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Abstract

The developmental and life-course criminology (DLC) paradigm has become increasingly popular over the last two decades. A primary limitation of this paradigm is the lack of consideration of race and ethnicity within its framework. Race unquestionably matters in today's society and yet it has generally been ignored within the context of DLC theories. The current study aims to contribute to the literature informing DLC by viewing life-course theories through the lens of race and ethnicity. Utilizing nationally-representative data from the National Longitudinal Survey of Youth 1997, the current study examines race-specific developmental trajectories of offending over 11 years during the transition from adolescence to adulthood. The current study employs semiparametric group-based mixture modeling (SPGM) in order to assess heterogeneity in the development of offending both in general and across race and ethnicity. Racial and ethnic differences in offending trajectories are explored and the relevance of these findings is discussed in relation to extant DLC theories. Additionally, the current study explores the utility of theoretically relevant risk and protective factors for distinguishing between offending trajectories and examines whether or not the ability of these factors to distinguish trajectories varies across race and ethnicity. In examining the generality of risk factors across offending trajectories, the current research also explores the utility of general versus developmental theories of offending.

The results of the current study indicate that there are stark similarities in the number and patterns of offending trajectories that emerge across race and ethnicity. Additionally, the current study finds support for both general and race-specific effects regarding the ability of risk and protective factors to distinguish offending trajectories. The finding that some risk factors have race-specific effects has implications for DLC theories which predict racial invariance in the causal processes that influence offending throughout the life-course. Additionally, the current study finds little evidence of trajectory-specific etiologies across the full study sample. This finding supports general over developmental theories and is consistent with prior research which indicates that risk factors are best able to distinguish between offenders and non-offenders rather than between offenders who follow divergent developmental trajectories. Overall, the current study findings contribute to the growing body of empirical research examining key DLC issues in the context of race and ethnicity.

Chapter 1: Introduction

As the title of Cornel West's (1993) influential book unequivocally proclaims, "Race Matters" in America (West, 1993, 1). Without question, race is a central organizing principle of American society (Peterson, Krivo, & Hagan, 2006). Although the United States is considered a desegregated nation, it experiences a "deep and persistent racial divide" in many key areas of society (Lynch, Patterson, & Childs, 2008, 13). Throughout the life-course, race and ethnicity have the potential to impact, among other things, access to income, access to health care, quality of and access to education, employment, poverty, and contact with the criminal justice system.

The growing body of life-course research in the field of criminology has often neglected the idea that race does in fact matter in shaping the lives of individuals in the United States. While scholars have acknowledged this limitation and research has begun to explore the mechanisms through which race and ethnicity influence developmental patterns of offending and antisocial behavior, the lack of consideration of race and ethnicity remains a limitation of extant developmental life-course theories. Life-course theories do not generally acknowledge the role that race and ethnicity may play in influencing the factors that shape offending behaviors throughout the life-course or how key causal processes may vary across race and ethnicity.

The current study aims to contribute to the literature informing developmental and life-course (DLC) criminology by viewing life-course theories through the lens of race

and ethnicity. Utilizing nationally-representative data from the National Longitudinal Survey of Youth 1997, the current study examines race-specific developmental trajectories of offending during the transition from adolescence to adulthood. Racial and ethnic differences in offending trajectories are explored and the relevance of these findings is discussed in relation to extant DLC theories. Additionally, the current study explores the utility of theoretically relevant risk and protective factors for distinguishing between offending trajectories and examines whether or not the ability of these factors to distinguish trajectories varies across race and ethnicity. In examining the generality of risk factors across offending trajectories, the current research also explores the utility of general versus developmental theories of offending.

Within the field of criminology, the relationship between race and offending has received considerable theoretical and empirical attention, but this issue has generally been tackled with some reservation. Race has been referred to as the “most controversial demographic of crime”, a reality that is reflected in the reluctance of many criminological scholars to study the issue (Sampson, 1997; South & Messner, 2000, 87). The existence of a relationship between race and crime has been fairly well-established within the field, but the mechanisms underlying this association have received considerably less attention. For instance, while official statistics consistently show that minorities are disproportionately involved in serious offending there is little agreement about the causes of this empirical finding. Additionally, there is a considerable amount of discrepancy regarding the magnitude of racial disparities in offending when official statistics are compared to self-report data. While the relationship between race and crime has received a fair amount of empirical attention, criminological theories have not been able to

account for this relationship very well at all (see Hawkins, Laub, & Lauritsen, 1998; Sampson & Lauritsen, 1997). Further dissection of the complex relationship between race and crime is needed and a better understanding of the issue has both theoretical and practical implications.

In recent years, social scientists have increasingly applied a life-course perspective to the understanding of human behavior (see Elder, 1985). Criminologists have utilized the life-course perspective in an attempt to better understand the etiology and patterning of antisocial behaviors and delinquency over the life span by focusing on trajectories or patterns of behavior and the life events and transitions which shape the behaviors of individuals over time (Elder, 1985). When applied to antisocial behavior, the perspective suggests that crime and delinquency are age-graded and the product of specific developmental processes. Life-course criminology typically focuses on continuity and/or change in offending trajectories over time and the events that impact these trajectories. Within the field of criminology, the life-course perspective represents a theoretical extension of the criminal career paradigm (Farrington, 2003). Like the criminal career paradigm, life-course theories seek to explain when and why offenders begin offending (onset), the incidence and prevalence of offending throughout the life span, whether or not offenders continue to offend as they age (persistence), when and why offending becomes more frequent or serious (escalation), and the eventual cessation of offending (desistence) (Piquero, Farrington, & Blumstein, 2007). Life-course criminology is more theoretical than its criminal career predecessor and focuses on explaining these phenomena at the individual level.

While the life-course perspective has received considerable empirical assessment and support, the role of race and ethnicity in shaping the life-course has often been ignored (Piquero, MacDonald, & Parker, 2002; Piquero, Farrington, & Blumstein, 2007). With a few exceptions (e.g., Groves & Frank, 1993; Lynch, 1999), criminological scholars have not explicitly theorized the mechanisms through which race affects delinquency throughout the life-course. While this issue has received some empirical attention in recent years (Haynie, Weiss & Piquero, 2008; Higgins et al., 2010; Jennings et al., 2010; Moldonado-Molina et al., 2009; 2010; Piquero et al., 2002; Piquero, Moffitt & Lawton, 2005; Piquero & White, 2003; Reitzel, 2006), little research has explored if and how the processes suggested by life-course theories vary across race (Piquero et al., 2002). With race being a central organizing principle of American society, this lack of consideration of race within the developmental life-course perspective reflects a serious limitation of current developmental life-course (DLC) theorizing.

The current research bridges this gap in the literature by exploring race differences in offending patterns across the life-course and examining the validity of existing life-course theories for explaining offending in minority samples. While several studies have examined race and ethnic-specific trajectories of offending, the unique contribution of the current study is the examination of how risk and protective factors distinguish offending trajectories across race and ethnicity. Until recently, much of the empirical evidence that had been offered in support of life-course theories came solely from longitudinal samples of white males (Piquero, Farrington, & Blumstein, 2007), and little empirical evidence had specifically examined life-course theory in relation to other racial and ethnic groups. Several recent studies have explored developmental trajectories

in Hispanic samples and examined the ability of risk and protective factors to distinguish offending trajectories within these samples (Jennings et al., 2010; Moldonado-Molina et al., 2009; 2010); however, there is still a lack of studies that have examined the factors that distinguish offending trajectories among African-Americans. Additionally, no study to date has explored these issues within a single, nationally-representative sample. In order to contribute to this growing body of literature, the current study examines race and ethnic-specific offending trajectories and explores whether the same causal processes that shape white offending trajectories also impact minority offending trajectories.

The Age-Crime Relationship and Developmental Life-Course Criminology

The relationship between age and crime is one of the most well-established and robust findings in the field of criminology (Farrington, 1986; Greenberg, 1985; Hirschi & Gottfredson, 1983; Quetelet, 1831/1984; Thornberry, 1997). Social researchers have studied the relationship between age and criminal offending since the early 19th century. In his early exploration of the sociological causes of crime and deviance, Quetelet (1831) recognized age as the strongest predictor of an individual's propensity for crime. Contemporary researchers have continued to explore the relationship between age and offending and have generally found that the aggregate age-crime curve begins in late childhood, peaks in adolescence and the early twenties and declines through adulthood (Farrington, 1986; Hirschi & Gottfredson, 1983). The consistency of this finding across time and place has been well-documented (see Hirschi & Gottfredson, 1983) however some scholars have questioned the universality of these aggregate patterns (see Greenberg, 1985).

The age-crime relationship serves as the genesis for developmental and life-course criminology (DLC). After establishing this relationship as an empirical reality, scholars focused their attention on explaining the age-crime relationship and exploring the phenomenon at the individual level. DLC theories attempt to explain individual trajectories of offending with a focus on within-individual changes in offending behaviors (Farrington, 2003; 2005; 2006). According to Farrington (2003, 221), DLC theories focus on three main issues: the development of antisocial behavior and offending, the role of risk factors at different ages, and the effects of life events on trajectories of development. In general, DLC recognizes that offending behavior is age-graded/developmental in nature; different risk factors are more salient than others at different life stages or for different types of offenders; and life events can alter trajectories of antisocial behaviors and foster change.

Another empirical observation that underlies DLC is the oft-cited notion that virtually all antisocial adults engaged in antisocial behavior as children, but not all antisocial children become antisocial adults (Robbins, 1978). Prior offending is one of the best predictors of future offending and yet most delinquents do not go on to become serious adult offenders (Cohen & Vila, 1996). This consistent finding has been labeled as the “paradox of persistence” because there is evidence of both considerable stability and widespread change in offending behaviors over time (Cohen & Vila, 1996, 141). This paradox illustrates a key point of divergence for existing DLC theories; the existence of continuity and/or change in antisocial behavior over time. Some theorists argue that there is only continuity of antisocial behavior because these behaviors are the product of a stable underlying criminal propensity (Gottfredson & Hirschi, 1990) while others argue

that there is considerable stability in offending but change is likely and is central in understanding offending behaviors over the life-course (Laub & Sampson, 1993; 2003; Sampson & Laub, 1993; 2003) and yet others argue that both continuity and change exist and there are distinct groups of offenders whose trajectories can be characterized by either continuity or change (Moffitt, 1993; Patterson & Yoerger, 1999).

DLC theories can be classified based on their handling of the continuity/change debate and whether or not they acknowledge that distinct groups of offenders exist within the universe of individuals who engage in antisocial behaviors (Paternoster et al., 1997). Paternoster and colleagues distinguish theories as general or developmental and static or dynamic. General theories predict universal causes of offending while developmental theories posit distinct groups of offenders with unique etiologies. Static theories predict that the causes of offending are the same throughout the life-course and that once causal processes have occurred, little avenue for behavioral change exists. Conversely, dynamic theories predict that the influence of causal variables varies across developmental stages and that change in offending behaviors is likely to occur throughout the life-course. The Paternoster et al., schema allows for four potential types of criminological theories: static-general, dynamic-general, static-developmental, and dynamic-developmental (Paternoster et al., 1997).

Gottfredson and Hirschi's (1990) general theory of crime, for example, traces the origins of antisocial behavior to early childhood and is posited to explain offending and analogous behaviors throughout the entire life-course. Using the classification schema laid out by Paternoster and colleagues (1997), Gottfredson and Hirschi's theory can be classified as a *static-general theory* because it suggests that there are general causes of all

offending and once individuals have a propensity to offend (low self-control) there is little avenue for behavioral change throughout the life-course. In relation to DLC, Gottfredson and Hirschi's general theory of crime suggests that the causes of antisocial behaviors are universal and continuity in offending is to be expected throughout the entire life-course. The universal causation tenet of the theory implies that offending by all subgroups (i.e., juveniles and adults, males and females, whites and minorities) has the same root cause (low self-control). The theory does not recognize distinct groups of offenders; rather it suggests that all individuals vary on a continuum of self-control.

Sampson and Laub's (1993) age-graded social control theory takes a different stance in explaining the age-crime relationship and the patterning of offending throughout the life-course. Their theory suggests that there are persistent individual differences in the propensity for offending that are the product of structural conditions and the effect of these structural conditions on offending is mediated by informal social controls and social bonds. The theory further predicts that there is a considerable amount of stability in offending trajectories throughout the life-course but change in trajectories is likely when individuals encounter turning points which alter their trajectory of antisocial behavior. For Sampson and Laub, turning points are life events that change the level of informal social control in an individual's life and can lead to escalation of, or desistance from, offending. The primary life events that may serve as turning points in adulthood are marriage and employment. These events are likely to increase an individual's stake in conformity, alter their level of informal social control, and change their routine activities, potentially altering their trajectory of antisocial behavior and criminal offending. Change is a central part of Sampson and Laub's theory. The theory

suggests that desistance from offending is universal and needs to be explained by all DLC theories.

Based on the criteria set forth by Paternoster and colleagues (1997), Sampson and Laub's theory is best classified as a *dynamic-general theory*. The theory is general in that it predicts universal causation and yet dynamic because it allows for change in trajectories of offending and related behaviors over time. The theory does not predict multiple groups of offenders and maintains that the causes of criminality are the same for all individuals regardless of what trajectory they appear to follow. The central tenet of the theory is that persistence and desistance can be explained by the same causal mechanisms, namely, informal social control, routine activities, and human agency (Laub & Sampson, 2003). According to the theory, all trajectories of offending can be explained by differing levels of formal and informal social controls. Initiation and persistence in offending are explained by a lack of informal social control while desistance is the product of increased informal social control that results from reaching turning points which alter offending trajectories.

Yet another group of DLC theories reject the general nature of Gottfredson and Hirschi's and Sampson and Laub's explanations of offending over the life-course in favor of more specific explanations that disaggregate the age-crime curve into distinct groups of offenders who follow different trajectories with unique etiologies. The most well-known of these group-based theories is Moffitt's (1993) developmental taxonomy. Moffitt's taxonomy solves the "paradox of persistence" by suggesting that there are two distinct types of offenders; those who begin offending early and persist throughout the life-course (*life-course persistent*) and those who follow a more normative trajectory and

offend for a brief period during adolescence before desisting and returning to prosocial trajectories in young adulthood (*adolescence-limited*). The origins of life-course persistent (LCP) offending are traced to early childhood and may even occur before birth. According to Moffitt, LCP offending is caused by the interaction of neurobiological deficits and environmental risk factors (i.e. poor parenting, poverty, family disruption). LCP offenders start offending earlier, persist in offending longer, engage in a variety of forms of antisocial behaviors, offend more frequently, and are unlikely to desist from antisocial behavior. These individuals engage in age-appropriate manifestations of antisocial behaviors throughout the entire life-course. “Continuity is the hallmark of this small group” of persistent offenders (Moffitt, 1993, 679) and they can account for the considerable amount of stability in offending that is evident in the existing empirical data.

In addition to these life-course persistent offenders, Moffitt proposes a second group of offenders whom she labels adolescence-limited (AL). These individuals are hypothesized to follow a “normative” trajectory of offending that peaks in adolescence and young-adulthood and drops off abruptly as adult status is achieved. The primary cause of AL antisocial behavior is “social mimicry” of antisocial peers that occurs because these adolescents are caught in the “maturity gap” (Moffitt, 1993, 687). Moffitt argues that because adolescents are unable to achieve adult statuses through traditional means they turn to delinquency as a way of illustrating their autonomy. As these AL’s reach adult statuses, their offending rapidly declines and most of them are predicted to desist from antisocial behaviors all together. Offending by AL’s is predicted to be temporary and less serious than offending by LCP’s. Additionally, AL’s do not suffer from the neurobiological deficits and environmental problems that make change difficult

for LCP's and therefore are expected to desist from offending. Change is the hallmark of AL offending. According to the Moffitt's theory, the aggregate age-crime curve masks these two distinct groups of offenders and theories of offending need to be able to explain both patterns in order to be complete.

Like Moffitt's theory, Patterson's (1989; 1993; 1999) theory also predicts a two-group developmental model of offending. Patterson's theory differentiates between early and late-starters and, like Moffitt's, suggests that both trajectories of antisocial behavior have unique causes that manifest themselves at different ages. The primary cause of early-onset offending is poor parenting which leads to school failure and rejection by normal peers. This rejection by normal peers leads early-starters to become involved with a deviant peer group and consequently become involved in age-appropriate manifestations of deviance that escalate over the life-course. Late-starters, who begin their offending in mid-adolescence, do not suffer from the same poor family environment and do not become involved in delinquency until they begin to interact with their deviant peers. Because of their less adverse childhood experiences, late-starters do not suffer from the same academic and social failures and therefore are likely to drop out of the offender pool more rapidly than early-starters (Patterson, 1993; Patterson, DeBaryshe, & Ramsey, 1989; Patterson & Yoerger, 1993; 1999).

Both Moffitt's and Patterson's theories suggest that there are distinct groups of offenders whose trajectories of offending can be explained by very different developmental processes. This differentiates them from the general theories of Gottfredson and Hirschi (1990) and Sampson and Laub (1993) which predict universal causation. Based on the argument laid out by Paternoster and colleagues (1997) these

group-based theories are best classified as developmental because they reject the idea of universal causation and assume that different causal processes explain different offender types (Paternoster et al., 1997). The life-course persistent and early-starter paths are classified as *static-developmental* theories while the adolescent-limited and late-starter paths are best classified as *dynamic-developmental* theories (see Paternoster et al., 1997). A key issue relating directly to this classification schema is the argument between parsimony and complexity. If distinct groups of offenders with unique etiologies do exist then the complexity of developmental theories is necessary in order to explain the unique causes of these different trajectories, however, if group-specific etiologies do not exist, then general theories are preferable because they are more parsimonious. More complex, developmental models are warranted “only if the complexity of a multiple pathways theory significantly increases our understanding of the etiology of crime” (Paternoster et al., 1997, 236). In exploring the generality or specificity of risk factors for distinguishing offending trajectories, the current study aims to inform the issue of complexity versus parsimony in criminological theory.

All of the theories described here and in Paternoster and colleagues have received empirical support and remain relevant in contemporary criminology. However, the debate still remains as to whether a general theory is capable of explaining all types of offending and offenders or if more specific, group-based, theories are necessary to account for the diversity that exists within the pool of offenders.

Race and DLC

As noted above, extant research on crime over the life-course has often neglected the role that race may play in the development and patterning of offending behaviors.

Given official measures indicate that there is considerable evidence of disproportionate minority involvement in some types of crime and that race is a central organizing principle of American society, it seems necessary to include race in the context of DLC (Piquero et al., 2002). Many of the key risk factors for offending that are suggested by DLC theories occur disproportionately across race and ethnicity. Within the literature on race and crime, scholars have explored whether there are different risk factors for white and nonwhite offending or whether certain risk factors are disproportionately prevalent in nonwhite populations. Empirical evidence more strongly supports the prediction that the risk factors for offending are universal across race and ethnicity, but many key risk factors disproportionately occur in minority populations. Farrington and colleagues (2003) found that the correlation between the number of risk factors experienced and violent offending was virtually identical for Caucasians and African-Americans, but that African-Americans experienced much higher levels of risk, especially structural risk. They concluded that African-Americans are more likely to experience risk factors than Caucasians, but that it remains unclear whether unique developmental processes occur for minorities compared to whites.

The current study aims to better understand the development of offending behaviors across race and ethnicity by examining race-specific trajectories of offending and exploring how risk and protective factors distinguish trajectories across race and ethnicity. This research is needed because a major limitation of the DLC paradigm is that it has often failed to consider how the causal processes predicted by life-course theories may vary across race and ethnicity (Piquero et al., 2002). Additionally, research from the risk factor paradigm has yet to establish whether or not risk factors have general or

specific influences across race and ethnicity and only one study to date (Reitzel, 2006) has explored the ability of risk factors to distinguish offending trajectories across race and ethnicity. The concept of race has generally been ignored within the context of DLC theories and yet race serves as a central organizing principle in American society. This represents a major gap in the support for life-course theories which needs to be addressed empirically. As noted above, racial identity structures the life-course of individuals across several important domains including contact with the criminal justice system (Lynch, 1999).

Some developmental life-course theories have explicitly hypothesized about race differences in offending behaviors (Moffitt, 1994; 2006b), while others argue that race is not important because the causes of offending throughout the life-course are universal (Gottfredson & Hirschi, 1990; Sampson & Laub, 1993). Acknowledging higher crime rates for African-Americans, Moffitt (1994) suggests that race differences in official crime statistics may result from a “relatively higher prevalence” of blacks in both life-course persistent and adolescence-limited subtypes. A higher prevalence of blacks in LCP offending is predicted because “institutionalized prejudice and poverty” increases the likelihood that the root causes of this type of offending will be experienced (Moffitt, 1994, 38-39). Additionally, the environmental factors that interact with neurobiological deficits may be more prone in poor black families and disadvantaged schools and communities. A higher prevalence of blacks in AL offending is predicted because antisocial models are more likely to be readily available in racially-segregated, disadvantaged neighborhoods. Additionally, blacks are predicted to persist in the maturity gap due to a lack of legitimate opportunities for employment. This persistence in the

maturity gap leads to a greater amount of time spent at-risk of becoming ensnared by negative life events that delay the desistence process (Moffitt, 1994). Simply put, Moffitt's theory suggests that the causes of LCP and AL offending are the same for whites and minorities but that the risk factors for both types of offending may be more prevalent in the lives of minorities.

Empirical tests that have attempted to address the issue of race within the developmental life-course framework have explored a number of interesting issues. Extant empirical studies have assessed whether or not the life events predicted by Sampson and Laub to influence desistence have the same effects across race and ethnicity (Piquero et al., 2002); if the causal processes laid out by Moffitt can account for LCP offending by blacks and whites alike (Piquero et al., 2005; Piquero & White, 2003); if blacks do in fact persist in the maturity gap and spend more time at-risk of becoming ensnared as suggested by Moffitt (Haynie, Weiss, & Piquero, 2008; Higgins et al., 2010); and how trajectories of offending vary both within (Jennings et al., 2010; Maldonado-Molina et al., 2009; 2010) and between (Cohen, Piquero, & Jennings, 2010; Reitzel, 2006) racial and ethnic subgroups. While these studies have laid the groundwork for a better understanding of how the age-graded processes suggested by DLC vary (or are the same) across race and ethnicity, there is still considerably more work to be done. A couple of key limitations of the current body of literature concerning race and DLC include a lack of empirical tests of race differences within a single, nationally representative sample, and a lack of competitive tests of the contradictory propositions of extant DLC theories. Additionally, while recent contributions have explored the ability of risk and protective factors to distinguish offending trajectories in Hispanic populations,

much less research has explored this issue within African-American samples and across racial groups.

To summarize, despite several recent empirical tests that have begun to explore the generalizability of DLC predictions across race and ethnicity, much of what we know about the validity of these theories stems solely from research conducted within samples of white males. DLC theories do not make race-specific predictions regarding the causal processes that lead to offending and therefore DLC theories need to be tested in diverse samples in order to explore whether or not the findings derived from empirical tests conducted with white samples hold across race and ethnicity. Prior to the work of Maldonado-Molina, Jennings, and colleagues (2009; 2010; 2010), Hispanics had not been considered within the context of DLC theories at all. More research is needed in order to assess the applicability of DLC theories to minority populations. An additional limitation of the extant DLC literature is that the few studies that have addressed race-specific patterns of offending have not typically utilized nationally representative samples, making generalizability a concern. Finally, extant theories that make predictions about offending over the life-course have not commonly been tested in competition with one another.

The Current Study

The current study looks to expand what we know about race in the context of developmental life-course criminology by addressing these aforementioned limitations and exploring the issue of race and the life-course in greater depth. Utilizing data from the National Longitudinal Survey of Youth 1997, the current study looks to address a

number of research questions regarding the patterning of offending throughout the life-course across race and ethnicity and the factors that distinguish these patterns.

The first question to be addressed is whether or not there are in fact different trajectories of offending observable across race and ethnicity. This question will be addressed using semiparametric group-based trajectory modeling (SPGM) and it is predicted that there will be more similarities than differences in general patterns of offending across race and ethnicity in the NLSY97 sample. This hypothesis is consistent with the large body of extant literature reviewed in Chapter 4 which indicates the consistency of findings regarding the number and shape of developmental trajectories across a diverse array of samples.

The second question that arises is whether the two trajectories of antisocial behavior suggested by Moffitt can be found across racial and ethnic subgroups. Based on the existing tests of Moffitt's theory utilizing group-based trajectory modeling, it is predicted that more than two groups of offenders will be found. At the same time, the two groups proposed by Moffitt will be evident within that larger number of groups for whites, blacks, and Hispanics. Additionally, the current study will examine Moffitt's (1994) prediction that African-Americans will have a higher prevalence of chronic and adolescent-limited offending. Consistent with Moffitt's prediction and years of official data suggesting minority overrepresentation in some types of offending, the current study hypothesizes that there will be a greater proportion of African-Americans classified in offending trajectories relative to whites.

A third question concerns the risk factors that are best able to predict membership in offending groups. If general theories like Gottfredson and Hirschi's and Sampson and

Laub's are correct, then the risk factors for offending are universal and will not vary for different groups of offenders. However, if different risk factors explain different trajectories of offending as suggested by Moffitt's and Patterson's theories, then group-based theories are supported. The key issue to be explored here is whether the added complexity of developmental theories is needed or if general theories are sufficiently able to explain offending across different developmental trajectories.

A fourth question addressed in the current study is whether risk factors vary in their ability to distinguish offending trajectories across race and ethnicity. Both general and group-based DLC theories suggest that the risk factors for offending are the same across race and ethnicity. Moreover, if risk factors do vary, they are predicted to vary in level only as opposed to kind. The current study predicts generality of risk factors across race and ethnicity, but does predict that neighborhood/structural risk factors will be more salient for minorities as opposed to whites.

By addressing these questions, the current research is intended to extend what we know about race and offending in the context of developmental life-course criminology. The chapters that follow examine the existing literature on the relationship between race and offending; assess the empirical status of existing DLC theories; review the literature concerning predicting offending trajectories with risk and protective factors; propose the data and methodology of the current study; layout the results of the current analyses; and discuss the implications and relevance of these findings for the field of criminology and more specifically, developmental life-course theories.

Chapter 2: The Relationship between Race and Crime

The existence of a relationship between race and crime has been well-established and frequently studied in the United States throughout the past century. While the explanations for this social phenomenon are conflicting and the results of empirical tests are mixed, racial disparities in the involvement in crime have been consistently found across time and place in the United States (Hawkins, Laub, & Lauritsen, 1998; Hindelang, 1978; LaFree, 1995; Morenoff, 2005; Piquero & Brame, 2008; Sampson & Lauritsen, 1997). The current chapter reviews empirical findings regarding the magnitude of the race-crime relationship and discusses the predominant explanations that have been proffered to explain this consistent finding. Despite decades of research and attempts to apply criminological theories to this phenomenon, criminological theorists have not been able to explain the complex relationship between race and crime very well. This chapter also explores how developmental life-course theories can be applied to the race-crime relationship and discusses the possible utility of this perspective for helping to better understand the link between race and offending.

The estimated size of racial and ethnic disparities in participation and rates of offending varies considerably across data sources (Hawkins, Laub, & Lauritsen, 1998; Lauritsen, 2005; Morenoff, 2005). African-Americans, and to a lesser extent Hispanics, are consistently shown to be disproportionately represented in official crime statistics (U.S. Department of Justice, 2010; Hawkins, Laub, & Lauritsen, 1998; Lauritsen, 2005;

Morenoff, 2005; Sampson & Lauritsen, 1997). This overrepresentation is most pronounced in serious and violent crime participation rates (Morenoff, 2005), and perhaps the most alarming disparity is observed when comparing blacks and whites in terms of homicide offending rates (Fox & Zawitz, 2007; Krivo & Peterson, 2000). Homicide trend data revealed that homicide offending rates in 2005 were more than 7 times higher for blacks than whites (Fox & Zawitz, 2007). This rate has fluctuated between 6 and 9 times higher since 1976 (Krivo & Peterson, 2000) and persists today. While the finding of differential minority involvement in offending has remained relatively stable over time, scholars have failed to fully agree on why these discrepancies exist and the greater societal implications of their persistence (Hawkins et al., 1998). Additionally, criminological theories have not adequately addressed this issue and have generally failed to account for why these racial differences exist and persist (Hawkins et al., 1998; Piquero, Moffitt, & Lawton, 2005).

Defining Race

An important caveat that must be acknowledged in the discussion of the relationship between race and crime is the definition of race itself. Race is not biologically defined; rather it is socially constructed and serves as a marker for a number of different constructs and social statuses which differentiate people within societies (Hawkins, 2003; Lynch, 1998; Mieczkowski, 2000; 2008; Morenoff, 2005; Sampson, Morenoff & Raudenbush, 2005)¹. Mieczkowski (2008: 212) argues that “biological race has no commonly agreed-upon definitive structure or scientific meaning”. Forensic science is unable to distinguish unique racial profiles and therefore race has no utility as a

¹ For more research concerning the definition of race from anthropological and sociological perspectives see: (Hannaford, 1996; Leach, 1975; Lieberman & Reynolds, 1978; Shipman, 1994; Sunderland, 1975).

biological variable (Mieczkowski, 2008). By this logic, race cannot be considered a cause of criminal behavior; it can only serve an indicator of a number of other factors which may be related to offending. The explanatory factors for which race may serve as an indicator include both individual and structural factors (Morenoff, 2005). Individual, familial, and neighborhood factors may all differ by the socially constructed concepts of race and ethnicity and therefore race and ethnicity may serve as indicators of these lower level constructs and can provide insight into the complex relationship between these constructs and offending behaviors (for more on this rationale, see Morenoff, 2005, 154).

Official Crime Statistics

The overrepresentation of African-Americans in official crime statistics is one of the most frequently researched and most commonly debated aspects of the relationship between race and crime (Piquero & Brame, 2008). The largest disparities between black and white involvement and offending rates are consistently found in official records of crime (Morenoff, 2005). Based on 3-year figures from the American Community Survey, the U.S. Census Bureau estimates that 13.1% of U.S. citizens are black or African-American (alone or in combination with one or more other races). This figure drops to 12.3% if you consider individuals who classified themselves as only black or African-American (U.S. Census Bureau, 2009). While African-Americans make up 12-13% of the total population, official arrest statistics indicate that African-Americans made up 28.3% of all arrestees in 2009 (Table 1). Consistent with previous research on racial disparities in official arrest statistics, the overrepresentation of African-Americans in rates of serious violence is considerably more pronounced. Based on 2009 Uniform Crime Report (UCR) data, African-Americans made up 49.3% of all homicide arrests and

55.5% of all robbery arrests compared to 48.7% and 42.8% for whites respectively.

Overall, African-Americans accounted for about 39% of all arrests for violent index crimes in 2009 (U.S. Department of Justice, 2010). Further examination of these 2009 data reveals that African-American arrests are disproportionate for all offenses other than driving under the influence and liquor violations. These data also reveal that the overrepresentation of African-Americans is more pronounced for violent crimes than property crimes.

Table 1

Index and Drug Arrests by Race (2009)

Offense	Total Arrests			Percent Distribution	
	Total	White	Black	White	Black
Total	10,690,561	7,389,208	3,027,153	69.1	28.3
Murder/manslaughter	9,739	4,741	4,801	48.7	49.3
Forcible rape	16,362	10,644	5,319	65.1	32.5
Robbery	100,496	43,039	55,742	42.8	55.5
Aggravated assault	330,368	209,922	111,904	63.5	33.9
Burglary	234,551	155,994	74,419	66.5	31.7
Larceny-theft	1,056,473	719,983	306,625	68.1	29.0
Motor vehicle theft	63,919	39,077	23,184	61.1	36.3
Drug abuse violations	1,301,629	845,974	437,623	65.0	33.6
All Violent Crime	456,965	268,346	177,766	58.7	38.9
All Property Crime	1,364,409	922,139	406,382	67.6	29.8

Source: Crime in the United States, 2009 – based on 2009 Uniform Crime Reports

The finding of racial disparity in official statistics has persisted for decades despite social, political, and scholarly discourse aimed at reducing disproportionate minority contact with the criminal justice system. The consistency of this finding is well illustrated by LaFree (1995) who compares black to white arrest ratios for UCR index crimes between 1946 and 1990. Despite considerable variation in the size of the ratios over time, black arrests greatly exceed white arrests for all seven index offenses

throughout the entire observation period (LaFree, 1995, 180-181). A look back at statistics reported by Hindelang (1978) in his early assessment of the race-crime relationship further illustrates the consistency of this finding. Hindelang reported that while blacks made up only 11% of the total population in 1975, they accounted for 54% of arrests for murder and nonnegligent homicide and 59% of robbery arrests (Hindelang, 1978). These statistics are extremely similar to those cited above from 2009 and raise questions about how much things have changed in the last 35 years. These examples provide empirical evidence of the consistency of minority overrepresentation in official measures of offending.

Another area where black-white disparities are evident is in official arrest statistics for drug abuse violations. The disproportionate rate and prevalence of drug-related arrests among minority offenders is a topic that has become increasingly salient in recent research on the relationship between race and crime since the inception of America's "War on Drugs". Scholars have focused on drug arrests and sanctioning as potential evidence of racial bias in the criminal justice system and as the key cause of racial disproportionality in correctional populations. While there is no evidence of higher rates of involvement in drug use among blacks (see Substance Abuse and Mental Health Services Administration [SAMHSA], 2008), arrests of African-Americans accounted for 33.6 percent of all arrests for drug abuse violations in 2009 (U.S. Department of Justice, 2009). African-Americans and to a lesser extent Hispanics have disproportionately been the target of the "War on Drugs" (Rosich, 2007; Tonry, 1995). Since 1980, black-white ratios of drug arrest rates have ranged from 2.8 to 5.5 (Human Rights Watch, 2009). Blacks have been consistently and disproportionately arrested for drug offenses

throughout the past three decades despite no evidence of minority over-involvement in drug use (Mitchell, 2009; Mitchell & Lynch, 2011). Subsequently, scholars have cited drug arrests as a major reason for the disproportionate representation of African-Americans in prisons and jails (Western, 2006) and have questioned the fairness of American drug policies.

Non-Official Data

While there is considerable evidence of racial disparity in official crime records, racial disparity is much less pronounced when self-reported measures of offending are considered (Morenoff, 2005). Self-reported data were brought into the discussion of race and crime in the late 1960's in order to overcome some of the limitations of and provide validity assessments of official statistics (Sampson & Lauritsen, 1997). The earliest of these self-report studies (Chambliss & Nagasawa, 1969; Gould, 1969; Hirschi, 1969) found little or no differences in rates of offending across race and ethnicity (see Hindelang, 1978; Sampson & Lauritsen, 1997). As better measures of self-reported delinquency were developed, new findings emerged regarding the race-crime relationship. Studies by Elliott and colleagues utilizing National Youth Survey (NYS) self-report data found that black males were disproportionately involved in serious and violent offending and that there were larger proportions of black males among frequent offenders (Elliott & Ageton, 1980; Elliott, Huizinga, & Morse, 1986). However, these race differentials were considerably less pronounced than those found in official records and these data showed little or no difference in self-reported prevalence in violent offending across race (Elliott, 1994; Hawkins, Laub, & Lauritsen, 1998). Elliott (1994) reported race differentials during adolescence of about 3 to 2 in the NYS compared to 4

to 1 in official record studies. Elliott did however find that African-Americans were more likely than whites to persist in violent offending into adulthood (Elliott, 1994). This latter finding has become the subject of some interesting empirical research aimed at better understanding the persistence of minority offending into adulthood (see e.g., Haynie et al., 2008; Higgins et al., 2010). Elliott calls attention to this stage of the life-course as a key area when race differences in offending behaviors may emerge. He suggests that a greater proportion of African-American offenders remain involved in serious offending into early adulthood and that a major reason for the consistently observed differences in arrest rates may be the prolonged involvement in serious offending by a greater proportion of African-Americans relative to whites (Elliott, 1994).

Several studies have sought to better understand the magnitude of the relationship between race and crime by comparing findings across multiple data formats (Hindelang, 1978; Lauritsen, 2005; Morenoff, 2005). Hindelang (1978) compared race-specific arrest data from the UCR to victim surveys from the National Crime Panel (NCP) (a predecessor of the National Crime Victimization Survey). He proposed that agreement between the two data sources would support the validity of the UCR while disagreement would lend support to arguments of bias in official arrest statistics. Hindelang focused on the common law personal crimes of rape, robbery, aggravated assault, and simple assault. His findings revealed perfect agreement between the two data sources for robbery; 62% of surveyed robbery victims reported their assailants were black and 62% of people arrested for robbery that year were black. For the other crimes of rape and assault, Hindelang found that blacks are overrepresented in official arrest records by about 10% compared to victim surveys. Although these analyses revealed some discrepancies

between the two sources of data, Hindelang concluded that arrest data are valid and that minority overrepresentation in official crime records is predominately the product of disproportionate minority involvement in serious personal crimes (Hindelang, 1978).

Lauritsen (2005) reviews empirical findings regarding racial differences in juvenile offending across the three predominant sources of data available. She compares official arrest statistics for juveniles to victimization and self-report data. Lauritsen observes that black juveniles are disproportionately arrested for violent, drug, and weapons offenses and that their involvement in property crimes is proportional to their representation in the population (Lauritsen, 2005). In order to assess the validity of these official statistics, Lauritsen compares them to other data sources. Her findings indicate that black youth, and Hispanic youth in some cities, are disproportionately involved in lethal violence. This finding is validated by witness reports and case evidence. She also finds that black youth are disproportionately involved in nonlethal violence as validated by victim surveys and self-reports, and weapons violations as validated by self-reports. Black youth are also disproportionately arrested for drug abuse violations but self-report data suggest that white youths report higher levels of drug abuse than black youths. For property crimes, white youth are more involved for some offenses while black youth are more involved in others; overall differences across the groups in terms of property offending are minimal (Lauritsen, 2005, 96). She concludes that existing empirical data on juvenile involvement in crime “suggest disproportionate black and, to a lesser extent, Latino involvement in violent crimes, but much fewer differences in other types of crimes” (Lauritsen, 2005, 97). These findings echo what is found by Morenoff (2005) who also compared empirical findings across these three primary data sources.

Morenoff's review indicates that racial differences in offending behaviors appear to be much larger in official statistics than they do in self-reported data and that race differences in crime victimization differ widely across crime type. Across all data sources, the greatest black-white differences are found for serious and violent offending and there is a general lack of data and research that compares Hispanic offending to that of either whites or blacks (Morenoff, 2005).

Differential validity of self-report data. While self-report data provide a much more conservative view of the magnitude of racial disparities in offending, critiques of this finding have suggested that self-report data are differentially valid across race, with minorities less likely to report certain offending behaviors (Hindelang, Hirschi, & Weis, 1981; Lauritsen, 2005; Morenoff, 2005; Sampson & Lauritsen, 1997). The differential validity argument stems from disparate findings in early self-report studies regarding the involvement in offending by minorities. While some studies found considerable disproportionate minority involvement (Elliott & Ageton, 1980), others found little or no evidence of minority over involvement in self-reported delinquency (Hindelang, Hirschi, & Weis, 1981). This lead to questions regarding the quality of self-report measures and their appropriateness for assessing racial differences in offending behaviors as well as to questions about the differential validity of self-reports across race and ethnicity. Some scholars hypothesized that the disparities between official records and self-reports as well as disparities across self-report studies were the product of minority underreporting of involvement in some offenses and/or samples (see Hindelang, Hirschi, & Weis, 1981).

Hindelang, Hirschi, and Weis (1981) found evidence of considerable racial differences in the likelihood of self-reporting crimes for which individuals had been

arrested or convicted for. Using reverse record checks, Hindelang and colleagues found that black males were substantially less likely than white males to report their offenses. Black males failed to report 57% of their serious offenses and 33% of their total offenses compared to 20% and 10% respectively for white males. Similar, but less severe discrepancies were observed for females (Hindelang, Hirschi, & Weis, 1981). These findings led the authors to conclude that self-report data were inappropriate for studying racial differences in offending behaviors. Findings like these made researchers hesitant to use self-report data to study race differences in offending behaviors for a number of years (Farrington, Loeber, Stouthamer-Loeber, Van Kammen, & Schmidt, 1996).

A more recent study by Farrington and colleagues (1996) found no evidence of differential validity of self-reports across race. Using data from the Pittsburgh Youth Study (PYS), they found that African-American males were no more or less likely to self-report offenses than were white males. They did find that whites were significantly more likely to report offenses while blacks were significantly more likely to report arrests; overall they found no differences in predictive validity of self-reports across race. Farrington and colleagues attribute their finding of improved validity of self-reports across race and ethnicity compared to early studies to improvements in the quality of self-report measures, lack of sample attrition, and face-to-face data collection techniques (Farrington et al., 1996). Regarding delinquency, Farrington and colleagues found that African-Americans were more likely to be serious delinquents than were Caucasians (33% compared to 18%). Since differential validity of self-reports was not an issue in this sample, they attributed these racial differences in self-reported delinquency to true differences in offending behaviors. Additionally, they found that African-American boys

were more likely than their Caucasian counterparts to have contact with the criminal justice system in the future. This led the authors to suggest that the development of delinquency may occur more quickly and more intensely for blacks compared to whites (Farrington et al., 1996).

A few additional studies have lent support to the validity of self-reports across race and ethnicity (Maxfield, Weiler, & Widom, 2000; Thornberry & Krohn, 2002) however, this support is not unequivocal. While Thornberry and Krohn found moderate to high validity of self-reports for both African-Americans and Hispanics in the Rochester Youth Development Study (RYDS) they did find that validity was stronger for Hispanics than African-Americans (Thornberry & Krohn, 2002). Maxfield and colleagues found no racial differences in validity for the most frequent offenders, but blacks were less likely to report their offenses than whites and there was less agreement between self-reports and official records for blacks compared to whites (Maxfield et al., 2000).

The findings reviewed here suggest that with improvements in survey methodology the validity of self-reports have been enhanced across race and ethnicity. This enhanced validity has provided researchers with more confidence to use self-reported survey data in order to assess the relationship between race and ethnicity and offending, however, there has still been reluctance within scholarly discourse to address the issue of the race-crime relationship using survey data. Additionally, while the existing literature has indicated that the validity of self-reports across race and ethnicity has improved, there is still concern over the issue of differential validity (Thornberry & Krohn, 2002). Researchers using self-report data need to be cognizant of the differential

validity issue, but self-reported survey data can provide a wealth of individual-level information about variables that may help researchers better understand the complex relationship between race and offending; valuable information that is not typically available in official data sources or victimization surveys.

Explanations of Differential Arrest Rates

Despite decades of empirical research, there is little consensus as to the explanation of the long-standing disproportionate rates of offending observed for minority individuals in official arrest statistics. The two competing explanations which have received the most empirical attention and support, and have been the subject of considerable academic and political discourse are the differential involvement hypothesis and the differential criminal justice selection hypothesis (Austin & Allen, 2000; D'Alessio & Stolzenberg, 2003; Piquero & Brame, 2008; Sampson & Lauritsen, 1997). The differential involvement hypothesis is rooted in the consensus perspective of law and punishment while differential selection arguments stem from conflict perspectives (Leiber, 2008).

The differential involvement thesis suggests that the disparate rates of arrest consistently observed for minorities reflect the empirical reality that minorities commit more serious and more violent crimes which are in turn punished more severely (Austin & Allen, 2000; Piquero & Brame, 2008). The differential involvement thesis also suggests that serious offending by African-Americans is more likely to persist into early adulthood where risk of incarceration is higher than during adolescence (Elliott, 1994). Taken together, the differential involvement hypothesis suggests that African-Americans and in some cases Hispanics are more likely to be offenders, offend more often, more

violently, and for a longer period of time than whites, and that this explains their overrepresentation in the criminal justice system rather than any discriminatory policies or practices within the system. The differential involvement perspective views racial bias in the criminal justice system as a random occurrence that is not the product of any overt racism (Leiber, 2008). A number of theories have been proffered to explain higher rates of minority criminality which will be discussed later in this review.

The second school of thought, often referred to as the differential criminal justice selection hypothesis, is rooted in the conflict perspective of crime and justice (Leiber, 2008). This explanation holds that racial disproportionality in arrests is the product of racially biased law enforcement and criminal processing practices rather than differential involvement in crime. The differential selection view suggests that “differential police presence, patrolling, and profiling, combined with discrimination in the courts and correctional systems, leads to more blacks being arrested, convicted, and incarcerated” (Piquero & Brame, 2008, 2). This thesis suggests that minorities are no more likely to be involved in crime than whites, but their crimes are more likely to be detected and punished by the criminal justice system. More specifically, this hypothesis holds that police are more likely to be deployed in the neighborhoods where minorities reside and are more likely to view minority group members as a threat and therefore are more likely to arrest and process minority offenders compared to whites (Beckett, Nyrop, & Pflingst, 2006). Subsequently, minorities are more likely to be labeled as offenders and experience the negative consequences associated with that label and the stigma of a criminal record (Leiber, 2008; Pager, 2004). This view is supported indirectly by research which compares official arrest data to victimization surveys and self-reports (e.g. see Hindelang,

1978; Sampson & Lauritsen, 1997). If official arrest statistics are shown to exaggerate minority prevalence in offending or offending rates, racial bias can be inferred. Another source of support for the differential selection hypothesis is the aforementioned disparities in arrests and punishment of minority drug offenders (Beckett et al., 2006).

While these two explanations of disproportionate official rates of offending have received extensive empirical scrutiny, neither explanation has given scholars a full understanding of the complex issue at hand. There is still much debate as to how much of the racial disparity in serious offending can be attributed to differential involvement and how much is likely the product of differential selection and processing within the criminal justice system. In his early assessment of the relationship between race and offending, Hindelang (1978), suggested that most sociological theories of offending fall “along a continuum in terms of the proportion of variation in racial differences in rates of arrest that is attributed to differential involvement vs. differential processing” (Hindelang, 1978, 94). This continuum allows for three main types of explanations: those that favor differential involvement, those that favor differential selection and processing, and those that recognize disparate arrest rates as the product of a combination of differential involvement and differential selection.

The hybrid explanation that allows for both differential involvement and differential selection effects is the most well-supported empirically. This view suggests that there is some level of differential minority involvement, but that race effects cannot be completely explained by differential offending alone. Existing empirical research commonly finds some evidence of differential minority involvement in certain types of offending but also that race effects remain even after controlling for criminal offending.

This leads to the conclusion that while there is evidence of differential involvement, there is still a quantifiable amount of influence that race has on arrest that is not attributable to offending behaviors. The size of these race effects varies across studies and samples. Piquero and Brame (2008) argue that scholars should not focus on whether race differences can be attributed solely to differential involvement or differential selection rather they should focus on the unique contribution of both mechanisms for explaining the observed patterns (Piquero & Brame, 2008).

A fourth, more critical, argument for explaining race differences in criminal justice contact has been proffered which suggests that differential involvement and differential selection both have the same root causes – structural racism and segregation (Lynch, 1999; Lynch et al., 2008; Massey & Denton, 1994). Lynch (1999) argues that the life choices of all individuals are structured by their status in society. This view of race differences in offending behaviors predicts that structural position and disadvantage predict both the likelihood that an individual will engage in behavior that is labeled as criminal by those in power in society and the likelihood that this behavior will result in arrest and criminal justice processing. The risk of criminal justice processing is exacerbated when the behavior is committed by a member of a group that is perceived as a threat to the interests of those in power. Further, race, class, and gender are interrelated and have an interactive effect on law and punishment (Lynch, 1999).

Race and Criminological Theory

Despite the fact that the relationship between race and crime has been fairly well established in empirical studies, criminological theories have not been able to explain race differences in offending behaviors very well (Hawkins, Laub, & Lauritsen, 1998;

Sampson & Lauritsen, 1997). Hawkins and colleagues (1998) argue that no theory of crime has adequately addressed the question of what accounts for racial differences in offending behaviors (Hawkins, Laub, & Lauritsen, 1998). This is likely the result of the fact that criminological theories have generally not been designed to explain racial differences in offending but rather have been applied “post hoc” (see Sampson & Lauritsen, 1997, 330). This suggests that rather than attempt to explain racial differences in offending, criminological theories have been proffered after the fact to explain patterns that are observed in empirical data. This lack of theorizing has likely contributed to the lack of adequate explanation for the observed racial differences in offending behaviors. If there are significant racial differences in offending behaviors, what variables can explain these differences at either at the individual or group level?

Theoretical explanations that have been applied to the relationship between race and crime include sub-cultural theories, constitutional difference theories, routine activities theories, socialization theories (e.g., differential association, learning, bonding), economic inequality/deprivation theories, differences in family structure and process, radical theories, minority/racial threat theories, and neighborhood/community structure explanations (see Leiber, 2008; Morenoff, 2005; Sampson & Lauritsen, 1997). For the most part, individual-level theories have not fared well in explaining the race-crime relationship due to the great deal of within-group individual differences that exist. Structural explanations have generally fared better but have not been able to fully elucidate the nature of the race-crime relationship either.

As noted in Chapter 1, the developmental life-course paradigm has become increasingly popular in the field of criminology over the last two decades; however, the

theories that form the foundation of this paradigm have not often been applied to the explanation of the relationship between race and crime. This is problematic because the life-courses of individuals are undoubtedly shaped by their racial and ethnic identities (Lynch, 1999). As Hawkins et al., (1998) note, “the social and developmental life courses of blacks and whites in the United States are products of not only their specific individual experiences but also their membership in historically distinct and unequal social and economic groupings” (Hawkins, Laub, & Lauritsen, 1998, 40). Again, race is a central organizing principle of American society that has the potential to impact the life-course of individuals in many ways. This logic can also be applied to Hispanics; especially in a time when immigration issues have taken a prominent place in contemporary political discourse. Specifically, first and second generation Hispanic immigrants face a number of unique challenges and life events that may serve as turning points in their life-course trajectories.

The current research aims to better elucidate the relationship between race and crime by looking at it from a developmental life-course perspective. Specifically, this study addresses a key gap in the literature by looking at race-specific models of the development of antisocial behavior at a key period of the life-course when racial differences in offending have been hypothesized to be most likely to manifest; the transition from adolescence to adulthood (Elliott, 1994). By looking at longitudinal trajectories during this time period we can explore if in fact there are significant racial differences in patterns of offending at this key stage in the life-course and what individual-level correlates best distinguish offending trajectories across race and ethnicity.

Conclusion

The debate over the relationship between race and crime has been going on for decades. In general, official arrest statistics indicate that minorities, especially African-Americans are disproportionately involved in criminal offending. This disproportionate minority involvement is especially pronounced in violent and other serious types of offending. The predominant explanations for minority overrepresentation in official arrest statistics are the differential involvement and differential selection hypotheses. There has been mixed empirical support for both hypotheses and some scholars suggest that a hybrid explanation is more accurate; one that allows for both differential involvement and differential selection effects. Other scholars argue that both differential involvement and differential selection stem from institutional racism and segregation within society. Self-reported survey data present a much less pronounced gap between blacks and whites in terms of offending. These survey data have been used to support differential selection arguments, but have also been questioned in regards to their validity across racial and ethnic groups.

Criminological theories have generally not fared well in explaining observed racial differences in offending. Developmental life-course theories have rarely been applied to the issue of race and crime and a better understanding of the relationship may be made possible by looking at the issue from a life-course perspective. The current study looks to extend our knowledge about the complex relationship between race and crime by examining the etiology of different offense trajectories across race and ethnicity in a nationally representative sample of adolescents and young adults.

Chapter 3: Theoretical Framework

The current research attempts to view developmental life-course criminology through the prism of race and ethnicity. Within the analysis of race differences in offending trajectories, the current study also aims to better elucidate the correlates that predict offending trajectories both in general and across racial and ethnic groups. The chapter that follows provides a brief overview of the criminological theories which inform the current analyses and reviews some of the key empirical literature that concerns each theory and is relevant to the current research. Also included in this chapter is a discussion of how each theory views race and ethnicity and how they attempt to account for racial differences in offending behaviors. The theories are then compared and contrasted based on their predictions about offending over the life-course and whether they predict that risk factors for offending are general or group specific. The issue of parsimony versus theoretical complexity is also discussed in relation to the theories guiding the current research.

Gottfredson and Hirschi's General Theory of Crime

As noted in Chapter 1, criminological theories can be classified based on how they account for continuity and change in offending over the life-course and whether they predict that there are unique developmental pathways of delinquency with unique etiologies or general pathways that underlie all offending patterns (Paternoster et al., 1997). The key question that arises is whether the added complexity of developmental

theories is needed or if more parsimonious general theories are sufficiently able to explain all types of offending and offenders? The most parsimonious theory is one that is both general and static across the life-course. Gottfredson and Hirschi's (1990) general theory of crime (or self-control theory) is an example of a general-static theory. Like classic control theories, Gottfredson and Hirschi's theory is based on the assumption that motivation for offending is universal and the key to understanding deviance is discovering what constrains people from acting on their motivations. According to Gottfredson and Hirschi's theory, the principle factor that prevents individuals from engaging in deviance is self-control. Consequently, individuals who have low self-control are likely to engage in a wide variety of criminal and analogous behaviors throughout the life-course because they lack this controlling factor. According to the theory, low self-control represents "the enduring criminality or criminal propensity that increases the likelihood that individuals will be unable to resist the easy, immediate gratification that crime and analogous behaviors seductively, and almost ubiquitously, present in everyday life" (Pratt & Cullen, 2000, 932).

Gottfredson and Hirschi recognize the common empirical observations that individuals who are antisocial in adolescence and adulthood typically manifest conduct problems in childhood and that antisocial behavior in childhood is perhaps the best predictor of antisocial behavior in later life (Cohen & Vila, 1996; Nagin & Paternoster, 1991; White, Moffitt, Earls, Robins, & Silva, 1990). Based on these observations, they trace the roots of low self-control to early childhood, and more specifically, to the quality of child-rearing by parents during this developmental period. According to the theory, children develop self-control when their parents are attached to them and monitor,

recognize, and punish their deviant behavior. Conversely, low self-control is predicted to develop when parents are not attached to their children; fail to monitor their behavior; do not recognize deviant behaviors as problematic; and/or neglect to punish deviant behavior when it occurs (Gottfredson & Hirschi, 1990). Thus, according to the theory, the primary antecedent of low self-control is ineffective child-rearing.

Also in line with the observation that there is considerable stability in antisocial behavior throughout the life-course, Gottfredson and Hirschi predict that there is little avenue for change in behavioral patterns throughout the individual life-course because an individual's level of self-control is fully developed by approximately age eight (Gottfredson and Hirschi, 1990). In order to explain the link between past and future offending, self-control theory argues that the cause of deviance is time-stable and is the product solely of population heterogeneity in an underlying criminal propensity. Therefore the link between past and future offending can be considered spurious because offending at all points in the life-course is simply the product of low self-control (see Nagin & Paternoster, 1991; Paternoster et al., 1997). Thus, according to the theory, criminal propensity (low self-control) is established early in life and remains stable throughout the life-course. In order to account for the decline of crime with age, the theory does allow for some change in absolute level of self-control, but argues that relative rank on the self-control continuum remains stable throughout the life-course (Gottfredson & Hirschi, 1990).

In sum, Gottfredson and Hirschi's general theory of crime predicts that low self-control is "for all intents and purposes, *the* individual-level cause of crime" (Gottfredson & Hirschi, 1990, 232 their emphasis). The theory proposes that traditional sociological

theories of offending (e.g., social bonding, social learning) are incorrect because they predict that social relationships influence the likelihood that individuals will or will not engage in delinquency over time (see Wright, Caspi, Moffitt, & Silva, 1999). Instead, the theory predicts a single developmental path to delinquency that is the product of low self-control which results from inadequate child-rearing. Social relationships (e.g., bonds, peer relationships) are rendered spurious because they are all the product of self-selection by individuals with low self-control.

Empirical status. Gottfredson and Hirschi's theory has been the subject of numerous empirical tests (Pratt & Cullen, 2000) and has generated considerable debate within the field of criminology (e.g., Hirschi & Gottfredson, 1994; Hirschi & Gottfredson, 1995; Sampson & Laub, 1995). A full review of the literature assessing the validity of the theory is beyond the scope of the current study, however, a meta-analysis conducted by Pratt and Cullen (2000) provides perhaps the best synopsis of the empirical findings concerning Gottfredson and Hirschi's theory. Pratt and Cullen conduct a meta-analytic review of the empirical status of Gottfredson and Hirschi's theory utilizing 21 empirical studies and 126 effect size estimates. Their sample represents the integration of data on more than 49,000 individual cases derived from 17 unique data sets (Pratt & Cullen, 2000). The results of this meta-analysis support self-control as a significant predictor of crime (weighted mean effect size = .223 when attitudinal measures are used; .288 when behavioral measures are used) across measurement strategies and diverse samples; however, the study findings do not support self-control as the lone predictor of crime. Studies including measures of social learning constructs explain 15.3% more variation in offending than do studies that simply include measures of self-control (Pratt

& Cullen, 2000). This finding contradicts Gottfredson and Hirschi's claim that the influence of other theoretical variables should not contribute significantly once self-control is included in explanatory models. Pratt and Cullen conclude that empirical evidence does suggest that self-control is related to offending and analogous behaviors and therefore self-control should be considered as an important predictor of criminal behavior; however, the claims that self-control theory is a general theory of crime and that the influence of self-control supersedes all other theoretical variables are not supported (Pratt & Cullen, 2000).

Explaining racial and ethnic differences. Unfortunately for the current study, the Pratt and Cullen meta-analysis was unable to identify any studies that reported analyses separately for racial groups and therefore was unable to assess the comparative effect size of self-control on crime between whites and African-Americans or other minority groups (Pratt & Cullen, 2000). Gottfredson and Hirschi (1990) do however attempt to explain racial and ethnic differences in offending. Acknowledging that there are large racial differences in rates of offending between whites and African-Americans and supporting official report statistics over self-report findings, they offer the explanation that racial and ethnic differences in offending are the product of differences in the level of self-control across race and ethnicity. Consistent with their explanatory model, they predict that differences in level of self-control across race and ethnicity are the product of "the potentially large differences among racial groups in the United States in the elements of child-rearing" (Gottfredson & Hirschi, 1990, 153). This statement suggests that parents in minority families are less able, or less apt to monitor, recognize, and punish deviant behavior. They do not cite specific empirical evidence to support this

claim. They also suggest that opportunities for crime may be more abundant in minority families due to less parental supervision (Gottfredson & Hirschi, 1990).

Few empirical studies have assessed racial differences in self-control or the developmental process that leads to low self-control. In an empirical evaluation of the impact of neighborhoods on self-control, Pratt and colleagues (2004) found that level of self-control did not differ between whites and non-whites in a sample of adolescents from the National Longitudinal Survey of Youth 1979. They did find that the causal model proffered by Gottfredson and Hirschi predicted self-control across whites and non-whites alike; that is, parental supervision and parental monitoring/discipline predicted higher levels of self-control across both groups. The major race difference that Pratt and colleagues found was that lack of neighborhood informal social control impacted parental supervision levels among non-whites but not among whites. This finding suggests that neighborhood context may play a more important role in the development of self-control for non-whites compared to whites (Pratt, Turner, & Piquero, 2004).

Contrary to Gottfredson and Hirschi's claim that minority parents are less able to properly socialize their children, there is a considerable body of literature that finds little evidence that minority children are poorly socialized or neglected (Hill, 2001). Research that explores racial differences in socialization processes often finds that social class plays a more central role in the socialization of children than race. Findings from these studies indicate that social class impacts socialization independent of race or ethnicity and that structural inequality directly undermines child-rearing practices (Hill, 2001; Lareau, 2002). There is also empirical evidence that suggests that the relationship between race and socialization practices is conditioned by neighborhood residence and

inequality (Brooks-Gunn et al., 1993). Overall, Gottfredson and Hirschi's claim of inadequate socialization by minority parents is not supported by extant empirical findings. Socialization practices are more likely to be influenced by social class and structural inequality than race or ethnicity. The direct influence of structural factors on the development of self-control is ignored by Gottfredson and Hirschi's general theory.

Theoretical critiques. The strength of the general theory of crime is in its simplicity and parsimony. In theorizing that there is only one individual-level cause of all types of deviant behavior and that this condition develops in one specific way and is fully developed before individuals reach puberty, the general theory of crime offers perhaps the simplest explanation of deviance available in contemporary criminology. Despite its simplicity, the theory has generated heated debates in the field of criminology over the past two decades and has been subject to much criticism. A list of many of these criticisms is neatly provided by Hirschi and Gottfredson (1994). Several of the criticisms of Gottfredson and Hirschi's general theory are of particular relevance to the current study. The most basic criticism of the theory is that it is too general. The theory attempts to explain low-level street crime in the same way that it would explain sophisticated corporate fraud. This is problematic for critics who argue that individuals who attain high-status corporate jobs would be very unlikely to achieve that status given that they were low on self-control. It is also problematic to suggest that the same underlying construct explains expressive and instrumental crimes which vary considerably in terms of motivational and situational factors.

Several criticisms of the theory are of particular salience for the current study. As Hirschi and Gottfredson (1994) point out, their theory has been criticized on the basis that

it does not acknowledge that the onset, persistence, and desistence of offending may have unique causes and correlates as suggested by the criminal career paradigm and later adopted by DLC (Blumstein, Cohen, & Farrington, 1988); additionally, the theory does not allow for unique classes of offenders whose trajectories of offending are marked by very different types and levels of offending behaviors which contradicts a key proposition of taxonomic theories of antisocial behavior (see i.e., Moffitt, 1993; Patterson & Yoerger, 1999); the theory is also critiqued on the grounds that it overstates the importance of self-control as the lone individual-level cause of crime (Pratt & Cullen, 2000; Sampson & Laub, 1995); and finally, the theory predicts that there is only stability of antisocial behavior over the life-course, ignoring the possibility of change in offending trajectories which is central to developmental life-course theories (Laub & Sampson, 2003; Moffitt, 1993; Sampson & Laub, 1993; 1995). Another important critique of the theory is that it fails to consider the influence of structural factors on offending and deviant behavior (Pratt, Turner, & Piquero, 2004). While the theory does allow for the influence of structural variables through their potential influence on child-rearing practices, it generally ignores the influence of key structural variables such as economic inequality, community social disorganization, and social capital. These structural factors have all been directly linked to the ability of communities and families to provide social control and socialize youth away from crime and deviance (Lynch & Michalowski, 2006).

Summary. Gottfredson and Hirschi offer a static-general theory of deviance which predicts that all offending can be explained by time-stable differences in an underlying criminal propensity which they label low self-control. Low self-control is the product of inept parenting and is fully developed during childhood. Once this criminal

propensity is established, it affects all subsequent life events, but is largely unaffected by these life events (Paternoster et al., 1997). The proposition that an underlying criminal propensity determines offending behaviors throughout the life-course makes change very unlikely to occur. Thus, Gottfredson and Hirschi predict that “there is a general cause of crime for all offenders and that, once the causal process has played out, change is unlikely” (Paternoster et al., 1997, 239). In order to explain racial and ethnic variations in offending, Gottfredson and Hirschi contend that parental socialization is inadequate in minority families; a claim that is not supported by extant empirical findings.

Sampson and Laub’s Age-Graded Theory of Informal Social Control

Sampson and Laub’s (1993) theoretical model was developed in order to explain crime and deviance throughout the entire life-course, or in childhood, adolescence, and adulthood (Sampson & Laub, 1993). By integrating traditional criminological variables from social bonding theory (Hirschi, 1969) into a life-course framework, Sampson and Laub developed a theoretical model that suggests that the primary causes of crime and deviance (informal social bonds) are the same throughout the life-course. The unique aspect of the theory is that it predicts that the influence of these informal social bonds is age-graded. This implies that social bonds have differential effects on crime and deviance at different stages of development. For instance, in childhood and adolescence, bonds to family, school, and peers are most salient, but as individuals age into young adulthood, bonds to higher education, labor force participation, and marriage become more important. Thus, Sampson and Laub’s age-graded theory of informal social control can be classified as a dynamic-general theory because it suggests that the causes of deviance

are general throughout the life-course, but that change in offending is probable (Paternoster et al., 1997).

Sampson and Laub's theory attempts to account for both stability and change in offending throughout the life-course. Like Gottfredson and Hirschi, they recognize that there is considerable stability in offending behaviors across time that is the product of an underlying criminal propensity; however, they also recognize that change in offending trajectories is possible and even expected. The theory has three major themes or propositions. The first is that structural context impacts delinquency in childhood and adolescence through informal social bonds to the family and school. These informal bonds are predicted to mediate the influence of structural factors on delinquency. The second major theme is that there is a considerable amount of continuity in antisocial behavior from childhood to adulthood. The third theme is that social bonds, and the social capital they create, explain changes in offending and antisocial behavior throughout the entire life-course regardless of childhood offending (Sampson & Laub, 1993). A full conceptual model is provided by Sampson and Laub (1993, 244-245).

The first proposition of age-graded theory is that structural variables such as poverty and family disruption influence deviance indirectly through informal social bonds. The theory specifies process variables which mediate the effects of structure on deviance. Within the family, the relevant informal social control variables are consistent parental monitoring, parental discipline, and attachment to the family unit. The important school mechanisms of informal social control are attachment to school and school performance (Laub, Sampson, & Sweeten, 2006; Sampson & Laub, 1993). The effects of relevant structural variables on delinquency are predicted to be fully mediated by family

and school bonds. Additionally, the theory also predicts that attachment to delinquent peers and siblings has a direct effect on delinquency, but that this influence is secondary to informal social bonds.

The second key proposition is that there is considerable continuity between adolescent delinquency and adult offending. Unlike Gottfredson and Hirschi who attribute continuity of offending strictly to population heterogeneity, Sampson and Laub suggest that continuity between delinquency and adult antisocial behavior is the product of both population heterogeneity and state dependence. State dependence explanations predict that offending has negative consequences which lead to further delinquency (Nagin & Paternoster, 1991). In line with the state dependence view, Sampson and Laub predict that delinquency impacts adult offending through its negative effect on the potential to form adult social bonds. For instance, if an individual is arrested early in life, they may jeopardize their future chances of securing stable employment which in turn may lead to prolonged involvement in criminal behavior. They label this explanation (similar to Moffitt's 1993 cumulative continuity) as cumulative disadvantage (Sampson & Laub, 1993; 1997). Sampson and Laub (1997) suggest that this process of cumulative disadvantage is exacerbated for disadvantaged populations (e.g., the urban poor). This cumulative disadvantage thesis predicts that structural disadvantages (e.g., poverty, residential isolation) increase the likelihood that delinquency in childhood and adolescence will lead to attenuated social bonds to important institutions (e.g., work, marriage) in adulthood and therefore increase the likelihood of stability of antisocial behavior (Sampson & Laub, 1997, 152-155). Put simply, this suggests that individuals in

disadvantaged structural positions may be a greater risk for prolonged involvement in crime.

The third key proposition of the age-graded theory of informal social control is that change in offending across the life-course is likely to occur. In contrast to the Gottfredson and Hirschi view of universal stability, Sampson and Laub posit that change in trajectories of offending can occur when individuals become bonded to institutions of informal social control in adulthood (Sampson & Laub, 1993). The theory predicts that “salient life events and socialization experiences in adulthood can, to some extent, counteract the influence of early life experiences” (Laub, Sampson, & Sweeten, 2006, 317). The theory holds that individuals may encounter life events that serve as “turning points” (Elder, 1985) which alter trajectories of antisocial behavior and offending throughout the life-course. Sampson and Laub (1993) specify some key institutions to which adult social bonds may be formed as marriage, work and the military. The original statement of the theory predicts that these adult social bonds can alter antisocial trajectories towards desistence by fostering social capital. This change is predicted to be possible even for individuals who manifested a high level of criminal propensity in childhood and adolescence. The effect of adult social bonds on delinquency is predicted to be direct and negative (Laub & Sampson, 2003; Laub, Sampson, & Sweeten, 2006; Sampson & Laub, 1993).

Empirical status. A full review of the empirical literature addressing Sampson and Laub’s age-graded theory of informal social control is beyond the scope of the current study and several reviews of this literature are available (Laub, Sampson, & Sweeten, 2006; Sampson & Laub, 2005a; 2005b). The current review focuses on

empirical pieces testing the age-graded theory of social control that have particular relevance to race and ethnicity. Sampson and Laub have published two books in which they test the propositions of their theory utilizing one of the most extensive and long-term longitudinal datasets ever collected (Sampson & Laub 1993, 25-63 for a description of the data). From these data, Sampson and Laub were able to conduct a series of empirical tests of the key propositions of their age-graded social control theory. Some of the key findings from these studies are discussed below.

Causes of delinquency. Consistent with the first theme of the age-graded informal social control theory, Sampson and Laub (1993) found that the strongest predictors of official and unofficial delinquency in adolescence were social bonds to family, school, and delinquent peers. Poor parental attachment, low parental supervision and harsh discipline were all positively related to both measures of delinquency. School attachment was negatively related to delinquency. Delinquent peer attachment had the strongest effect on official delinquency while school attachment had the strongest effect on unofficial delinquency. Additionally, childhood predispositions towards delinquency as operationalized as an early onset of antisocial behavior, difficult temperament, and violent tantrums were significantly related to both official and unofficial delinquency. The structural factors of residential mobility, family size, and crowding were also significantly related to both measures of offending, however, the effects of these structural variables were mediated by social process variables as predicted by the theory. Sampson and Laub (1993, Chapter 5) conclude that informal social control explains the greatest amount of the variance in adolescent delinquency even after controlling for structural variables and individual-level criminal propensity. This summary consists of

the findings from one study utilizing one data source and may not be generalizable to other samples. Additional support for the for the impact of social bonds on adolescent delinquency can be found in Kempf's (1993) review of the empirical status of Hirschi's social control theory.

Stability and change in offending. Research that indicates that there are both continuity and change in antisocial behavior over the life-course is quite consistent (Nagin & Paternoster, 1991; Paternoster et al., 1997; Sampson & Laub, 1993; 1997; Laub & Sampson, 2003). Additionally, several empirical studies have found support for Sampson and Laub's prediction that informal social bonds in adulthood have a significant impact on offending behaviors independent of criminal propensity (Blokland & Nieuwebeerta, 2005; Horney, Osgood, & Marshall, 1995; Laub, Nagin, & Sampson, 1998; Laub & Sampson, 2003; Paternoster et al., 1997; Piquero et al., 2002; Sampson & Laub, 1993; 2003). In sum, the empirical literature supports Sampson and Laub's prediction that there is both continuity and change in offending across the life-course and that change in informal social bonds during adulthood play an important role in fostering desistence from or change in offending.

Explaining racial and ethnic differences. Sampson and Laub's age-graded theory of informal social control can be classified as a general theory because it suggests that the causes of deviance and crime are the same for all types of people and all types of crime. Consistent with the general nature of their theory, Sampson and Laub suggest that the causes of crime are invariant across race and ethnicity. Sampson and Laub (1993) explicitly proffer that "the causes of crime across the life-course are rooted not in race, but rather in structural disadvantage, weakened informal social bonds to family, school,

and work, and the disruption of social relations between individuals and institutions that provide social capital” (Sampson & Laub, 1993, 255). In order to explain racial and ethnic differences in offending then, one might turn to some of Sampson’s other work (Sampson, 1997; Sampson & Wilson, 1995) which suggests that the structural conditions in which whites and minorities live are very different and it is these structural differences that are the key to explaining differential involvement in offending among whites and minorities. However, Sampson and Laub (2005a; 2005b) are quite critical of purely structuralist explanations of offending behaviors and therefore it is difficult to tease out an explanation for racial differences in offending from the literature discussing the age-graded theory of informal social control. That being said, the theory is general and therefore predicts that the causal mechanisms for crime and deviance are the same across race and ethnicity. Consequently, to the extent that there is differential involvement in offending across race and ethnicity, it must be assumed that this differential involvement can be explained by racial and ethnic differences in the key correlates of offending laid out by the theory (i.e., age-graded informal social bonds).

The issue of racial invariance in the causes of offending has rarely been tested in the context of Sampson and Laub’s theory. In an empirical assessment of the effects of local life circumstances across race, Piquero and colleagues (2002) provide support for the racial invariance hypothesis posited by Sampson and Laub. Piquero and colleagues found that changes in local life circumstances (e.g., marriage, full time employment) are related to changes in criminal activity for both whites and nonwhites and that the effect of changes in adult social bonds is more similar than different across race. Their findings do not however unequivocally support the prediction of racial invariance or the protective

nature of adult social bonds. Piquero and colleagues found that changes in levels of adult social bonds did not eliminate the relationship between race and violent offending. Additionally, when these authors look at the effects of marriage more closely, they found that legal marriages were protective against future arrests, but common-law marriages were crime-generating among nonwhites. Also problematic for Sampson and Laub's theory is that marriage is found to be positively associated with future violent arrests for whites and nonwhites alike (marriage was inhibitive of nonviolent arrests across both groups). These cumulative findings suggest that the effects of adult social bonds are only partially invariant across race. Piquero and colleagues conclude that "it is possible that adult institutions of social control may have different meanings across racial groups" (Piquero et al., 2002, 668). These findings illustrate the need for testing DLC explanations in diverse samples that include racial and ethnic minorities.

A study by Leiber and colleagues (2009) provides support for Sampson and Laub's claim that the influence of social bonds is invariant across race and ethnicity. In exploring the influence of family structure, family processes and economic factors on adolescent delinquency across race and ethnicity, Leiber et al., find that maternal attachment is the strongest predictor of offending for whites, blacks, and Hispanics alike. Additionally, support is provided for the salience of social bonds over family structure and economic indicators. None of the family structure or economic variables included in the study predicted minor or serious delinquency in their analysis of the Add Health Study data (Leiber, Mack, & Featherstone, 2009).

Theoretical critiques. The primary critique of Sampson and Laub's theory comes from Hirschi and Gottfredson (1995) who, as explicated above, suggest that offending in

childhood and adulthood is solely the product of population heterogeneity of a common underlying condition which they label low self-control. Their critique argues that individuals self-select into adult social relationships and that these relationships do not facilitate change in deviant behaviors, rather they provide new opportunities for deviance and analogous behaviors. For example, self-control theory predicts that individuals low on self-control select marriage partners who are also low on self-control and these relationships lead to new manifestations of the underlying criminal propensity. Sampson and Laub (1995) respond to this critique in detail and attempt to address it by controlling for criminal propensity in their original analyses (see Sampson & Laub, 1993, Chapter 8), however, the self-selection argument cannot be ruled out empirically and evidence of assortative mating does support Gottfredson and Hirschi's claim of self-selection in romantic relationships (Simons et al., 2002).

An additional critique of the age-graded theory of informal social control is that it misinterprets the mechanisms through which life events (e.g., marriage, employment) foster changes in trajectories of offending. Alternative explanations rooted in social learning theory argue that these life events alter offending behaviors through their influence on associations with delinquent peers (Akers, 1998; Simons et al., 2002; Warr, 1998; Wright & Cullen, 2004). Akers (1998:351) argues that "getting married, finding stable employment, and other significant turning points can be expected to affect differential association, reinforcement balance, exposure to conforming and deviant models, and pro- or anti-deviant definitions." Therefore, he suggests that Sampson and Laub's argument that life events alter offending behaviors through their effect on adult

social bonds is incorrect and the mechanism for change is actually a social learning process.

A third critique of the theory is that it downplays the significance of structural factors and does not provide a clear explanation for gender and racial differences in offending. While the theory does acknowledge structural influences and suggests that they play an important but indirect role in explaining delinquency, it seems to ignore the important direct affect that structural position may have on shaping the life choices of individuals (Lynch, 1999; Lynch & Michalowski, 2006). Alternative explanations of the influence of structural contexts suggest that structural position plays an important role by limiting the life choices that individuals have at their disposal. The structured life-course perspective (Lynch, 1999) predicts that membership in subordinate groups within society restricts the life choices of individuals throughout the life-course and therefore plays an important and direct role in shaping their behaviors across time.

Because the data that Sampson and Laub use is predominantly Caucasian and exclusively male, they are unable to empirically test the generalizability of their theory across race and gender. Therefore the theory might be questioned in terms of its validity across diverse samples including females and racial and ethnic minorities. Based on the logic of the theory, it must be assumed that to the extent that there are racial and gender differences in patterns of offending throughout the life-course, these differences can be explained by differing levels of age-graded informal social control. This proposition has rarely been empirically tested (see Piquero et al., 2002 for an exception addressing race) and represents an important empirical test that needs to be conducted in order to assess

the validity of the age-graded informal social control theory across gender and racial and ethnic groups.

Although the theory predicts that the causes of offending and changes in offending patterns are invariant across race and ethnicity, it fails to explore the empirical reality that key life events which may foster desistance do not occur at the same time or at the same rate across race and ethnicity. For instance, African-Americans are less likely than whites and Hispanics to marry (Goodwin, McGill, & Chandra, 2009; Goodwin, Mosher, & Chandra, 2010; Western, 2006) and more likely to experience joblessness (Bureau of Labor Statistics [BLS], 2011; Western, 2006). Hispanics are also more likely to experience joblessness than whites (BLS, 2011). If Sampson and Laub's theory is correct, this decreased likelihood of experiencing important trajectory altering turning points among minorities should predict prolonged offending trajectories among minorities; a prediction that has not commonly been explored by researchers in the context of Sampson and Laub's theoretical framework. This is a major limitation of the empirical literature supporting Sampson and Laub's theory which warrants further investigation.

Summary. Sampson and Laub's age-graded theory of informal social control predicts that there is both stability and change in trajectories of offending over the life-course and that both stability and change are the product of informal social control which effects delinquency in an age-graded way. The theory can be classified as a general but dynamic theory because it predicts universal causation but allows for considerable change in offending over time (Paternoster et al., 1997). The theory also predicts that structural factors impact delinquency indirectly through social bonds. The primary

correlates of offending early in the life-course are social bonds to the family and school as well as attachment to delinquent peers and siblings. As individuals reach young adulthood, the social bonds that are of greatest importance are attachments to the institutions of the labor force and marriage. Adult social bonds are predicted to facilitate a reduction in delinquency regardless of level of prior offending. The theory also predicts that desistance from offending is a universal process that occurs eventually for all offenders (see Laub & Sampson, 2003; Sampson & Laub, 2003).

Sampson and Laub's theory predicts that the same causal processes influence offending throughout the life-course across race and ethnicity. According to the theory, if racial variation in offending exists, it is the product of attenuated age-graded social bonds. An important empirical question that needs to be addressed in relation to Sampson and Laub's theory is what is the significance of the fact that adult social bonds form at different times and at different rates across racial and ethnic groups? Unfortunately, the current study is unable to address this question due to a focus on risk factors and outcomes measured during adolescence and early adulthood only. Future research is needed to explore the significance of this issue within the context of Sampson and Laub's theory.

Moffitt's Developmental Taxonomy of Antisocial Behavior

Unlike the theories reviewed above, developmental theories reject the argument that there are general causes of deviance that explain the antisocial behaviors of all individuals. These developmental explanations suggest that there are distinct groups of offenders within the universe of potential offenders who follow similar developmental trajectories of behaviors over time. Contemporary developmental theories predict that

there are specific causal processes that explain different patterns of antisocial behavior over the life-course. Consequently, causal explanation may vary across offending groups (Paternoster & Brame, 1997; Paternoster et al., 1997). Although other developmental theories exist, the current study focuses on Moffitt's developmental taxonomy of antisocial behavior.

Moffitt's (1993) developmental taxonomy was originally posited to account for two empirical facts which became evident from prior research into the complexity of the relationship between age and crime. The first fact addressed by Moffitt's developmental taxonomy is the continuity of antisocial behavior throughout the life-course. As noted above, the finding that prior offending predicts future offending is one of the more robust in the field of criminology (Nagin & Paternoster, 1991). According to Moffitt, any developmental theory of antisocial behavior must be able to reconcile the paradox of persistence; the fact that most antisocial adults were antisocial as children and yet most antisocial children do not become antisocial adults.

The second empirical fact central to Moffitt's perspective is the finding that the prevalence of antisocial behavior varies dramatically with age; peaking in adolescence but then regressing into adulthood (Farrington, 1986; Hirschi & Gottfredson, 1983). Moffitt cites a change in prevalence as opposed to a spike in incidence as the better explanation for the observed spike in aggregate offending during adolescence. Citing extant research, she illustrates that the prevalence of offending increases nearly tenfold during adolescence (Farrington, 1983; Wolfgang, Thornberry, & Figlio, 1987). This leads Moffitt to the conclusion that adolescent-onset offending plays a central role in shaping the aggregate age-crime curve and is in need of explanation.

According to Moffitt, for a developmental delinquency theory to be accurate, it must be able to account for these two consistent but somewhat conflicting empirical findings (Moffitt, 1993; 1994). In order to reconcile these divergent findings and address the paradox of persistence, Moffitt (1993) proposes a dual taxonomy of antisocial behavior. She predicts that observed differences in the stability of antisocial behavior across age reflect two distinct classes of individuals each with a unique etiology and pattern of behavior. This taxonomic approach is not unique to Moffitt. Other scholars have also suggested that distinct heterogeneity exists within the population of offenders and perhaps this heterogeneity can be used to classify distinct groups of offenders (Blumstein et al, 1986; 1988; Nagin & Land, 1993; Patterson et al., 1998; Patterson & Yoerger, 1997; 1999). The timing and duration of antisocial behavior is the key classifying factor in Moffitt's developmental taxonomy. The classification scheme recognizes both continuity and change in antisocial behaviors across age and predicts a different etiology for individuals whose deviance is stable compared to those whose trajectories of deviance are marked by considerable change. The developmental taxonomy suggests that the antisocial behavior of most individuals can be classified as either *life-course persistent* or *adolescence-limited* (Moffitt, 1993; 1994). According to Moffitt, these two types each reflect a well-documented empirical reality observed in the study of the relationship between age and crime and each group has a unique set of factors that predict the occurrence and patterning of antisocial behavior (Moffitt, 1993; 1994; 2006a; 2006b; Piquero & Moffitt, 2005).

As discussed in Chapter 1, life-course persistent (LCP) offending has its roots in early childhood. Moffitt suggests that this syndrome of life-long antisocial behavior is

caused by the interaction of neurobiological deficits and a criminogenic social environment in early childhood. The key manifestations of neurobiological deficits suggested by Moffitt's theory include low cognitive functioning, difficult temperament, and hyperactivity. It is predicted that these conditions interact with inadequate parenting, disrupted family bonds, and structural factors such as poverty to set in motion the LCP trajectory of antisocial behavior which continues throughout the life-course (Moffitt, 1993; 1994; Moffitt, 2006a; 2006b). LCP offenders are predicted to start offending early, engage in a variety of offending behaviors, offend at a high frequency, and persist in offending throughout the life-course. These individuals can be recognized by their early onset of delinquency and their stable trajectories of offending.

Because they are difficult as children, LCP offenders have poor relationships with parents, teachers, and peers and they fail to develop prosocial skills and attitudes. According to Moffitt, stability of offending for LCP offenders is explained by a process of cumulative continuity. Cumulative continuity suggests that antisocial behavior at one point leads to further antisocial behavior at a later point (Moffitt, 1993, 683). For example, if an individual drops out of high school, their low educational attainment may jeopardize their ability to get a stable job, in turn leading to further delinquency (this process is the same as Sampson and Laub's cumulative disadvantage). According to Moffitt, LCP offenders develop an underlying disposition for antisocial behavior that manifests itself in the form of age-appropriate manifestations of deviance throughout the life-course. Like Gottfredson and Hirschi's individuals with low self-control, these individuals are predicted to have little ability to change due to their underlying criminal propensity which is developed early in life. Moffitt's explanation of LCP offending is

consistent with a population heterogeneity argument which suggests that individuals vary on an underlying propensity to engage in antisocial behavior and that this propensity remains stable throughout the life-course (Nagin & Paternoster, 1991).

Moffitt's second group of offenders, adolescence-limiteds (AL), do not suffer from the same neurobiological deficits and criminogenic environments as their LCP peers and therefore are not predicted to be involved in persistent antisocial behavior. Instead, these individuals are predicted to follow a normative trajectory of antisocial behavior which begins in adolescence and subsides with the onset of adulthood and the attainment of adult social status. The primary cause of this type of offending is an interaction between the maturity gap and associations with delinquent peers (Moffitt, 1993). The maturity gap occurs when individuals reach biological maturity and begin to desire adult status and autonomy but are unable to obtain that status through conventional means. This status frustration is predicted to lead previously prosocial individuals to engage in delinquency in order to show their autonomy. Moffitt predicts that these AL individuals will mimic the behaviors of their LCP peers who appear to have autonomy and not be restricted by their status as adolescents. Moffitt labels this process as social mimicry and emphasizes the importance of deviant peers in explaining offending by adolescence-limiteds (Moffitt, 1993). Once individuals on the AL trajectory begin to reach adult status, they are predicted to desist from offending because they are no longer caught in the maturity gap and they do not suffer from the underlying antisocial propensity that afflicts their LCP peers. Change in offending is the defining feature of the adolescence-limited trajectory and AL's are predicted to desist from offending by early adulthood (Moffitt, 1993).

Empirical status. Moffitt's developmental taxonomy has been subject to considerable empirical assessment and empirical support has been provided for a number of Moffitt's key hypotheses (see Moffitt 2006a; 2006b for reviews); however, empirical tests have not unequivocally supported Moffitt's developmental taxonomy (see Laub & Sampson, 2003; Sampson & Laub, 2003). A full review of this empirical literature is beyond the scope of the current study. Instead, the brief review provided here focuses on empirical assessments which have applied a semi-parametric group-based mixture modeling approach (SPGM) (Nagin, 2005) similar to the methodology employed in the current study. Studies utilizing the trajectory methodology have been previously reviewed (Piquero, 2008) and some generalizations are possible based on this extensive body of research. These studies identify, on average, three to five groups of offenders which is not consistent with Moffitt's (1993) dual taxonomy. However, studies utilizing this methodology do typically identify two trajectories of antisocial behavior that resemble those proposed by Moffitt (an adolescent-peaked and a chronic offending group). Piquero comments on the impressive consistency of these findings, pointing out that they are the product of a wide range of studies utilizing data from different countries, with different lengths of follow-up, official and self-report outcome measures, and diverse samples (Piquero, 2008, 49). This consistency aside, the fact that these studies identify more than two groups of offenders is somewhat problematic for Moffitt's taxonomy. In order to address this issue, Moffitt has amended her theory slightly to allow for a third group of low-level chronic offenders who begin offending in adolescence and continue to offend at a low rate well into their adult years.

Regarding the differential risk predictions made by Moffitt (1993), the existing empirical support is mixed at best. Moffitt (2006a; 2006b) cites more than 25 studies which find that neurobiological deficits and family risk factors differentiate between childhood and adolescent-onset offenders. Contrary to Moffitt's claim of considerable empirical support, several existing studies find that the risk factors that predict offending trajectories or distinguish between offending groups established using prospective cut-offs are more similar than different across groups (Paternoster & Brame, 1997; Laub & Sampson, 2003; Sampson & Laub, 2003). Further explanation of the generality or specificity of risk factors for offending is discussed in the next chapter. In reviewing the literature concerning this issue, it is clear that further empirical research is needed to support Moffitt's claim that life-course persistent offending is predicted by different risk factors than adolescence-limited and other trajectories of antisocial behavior.

Explaining racial and ethnic differences. Acknowledging that any serious delinquency theory needs to be able to account for racial and ethnic differences in offending, Moffitt (1994) offers an explanation of race differences in offending that follows the logic of her developmental taxonomy. As noted in Chapter 1, Moffitt (1994) predicts that both life-course persistent and adolescence-limited offending will occur in higher prevalence among African-Americans. The explanation proffered by Moffitt suggests that this phenomenon is the product of structural factors which restrict the life chances of poor African-Americans. The higher prevalence of African-Americans in the LCP offending group is predicted because the root causes of this type of offending are more prevalent in African-American communities due to “institutionalized prejudice and poverty” (Moffitt, 1994, 38). Moffitt suggests that poor African-Americans have less

access to prenatal care, are more likely to be exposed to environmental toxins, may have attenuated familial bonds due to socioeconomic stress, and are more likely to attend disadvantaged schools with fewer resources to correct learning disabilities which may lead to poor educational attainment and underemployment (Moffitt, 1994). These adverse structural conditions place African-Americans growing up in poor communities at an elevated risk for LCP offending. Moffitt predicts that “for poor black children, the snowball of cumulative continuity is anticipated to begin rolling earlier, and it rolls faster downhill” (Moffitt, 1994, 39).

Moffitt’s prediction that adolescence-limited offending is more prevalent among African-Americans is explained by the elevated numbers of potential antisocial models in their communities, due to the higher prevalence of LCP offenders among poor African-Americans, and their persistence in the maturity gap due to a lack of opportunities for stable, legitimate employment. This persistence in the maturity gap leaves African-Americans at greater risk of becoming ensnared by the consequences of antisocial behavior and in turn may initiate the process of cumulative continuity thereby delaying desistance further (Moffitt, 1994). While it is not mentioned by Moffitt directly, if there is in fact differential criminal justice selection, this may also place African-Americans at greater risk for becoming ensnared in the process of cumulative continuity and lengthen their antisocial trajectories.

Moffitt’s explanation of racial differences in offending is the most developed of all of the DLC theories examined in the current study, however, the theory does not make predictions regarding offending by minority groups other than African-Americans. Like the theories of Gottfredson and Hirschi and Sampson and Laub, Moffitt’s race hypothesis

suggests that racial differences in offending are not the product of different causal process across race and ethnicity but rather different levels of key explanatory risk factors amongst minority groups.

A few empirical assessments lend support to the validity of Moffitt's causal model across race, but empirical support for her race hypotheses is less prevalent. Piquero and White (2003) examined the relationship between cognitive abilities and life-course persistent offending within in a sample of African-Americans. Their finding that cognitive ability is protective against LCP offending amongst African-Americans is consistent with Moffitt's causal model, but their analyses were unable to test the key proposition that African-Americans are more likely to be involved in life-course persistent offending than whites. Piquero and colleagues (2005) examined Moffitt's theoretical model in a sample which included African-Americans and Caucasians. They found that African-Americans were more likely to be classified as LCP offenders based on their criterion of being in the top 5% of the offending distribution. While different risk factors predicted LCP offending across race, there were no significant differences in levels of risk factors between the two groups leading to the conclusion that the correlates of LCP offending are more similar than different across race. Piquero and colleagues did however find that the interaction between neurobiological risk and adverse family conditions specified by Moffitt to predict LCP offending was exacerbated by neighborhood disadvantage for African-Americans but not for whites. This finding suggests that neighborhood context may play a more important role in the development of LCP offending for African-Americans than it does for whites. The generalizability of

the findings from both of these studies is questionable as they were both conducted using samples from single cities with a great deal of homogeneity across key risk domains.

Two additional studies examine Moffitt's prediction that African-Americans may be more likely to persist in the maturity gap and therefore become ensnared and persist in offending longer than whites. A study by Haynie and colleagues (2008) found that race differences in offending were eliminated once controls for economic and employment prospects were added to the explanatory model. This finding suggests that the race effect on offending is mediated by economic and employment variables or by structural processes. They also found that race was not related to persistence in offending, but economic and employment variables were. Race, however, was found to be significantly related to persistence in violent offending, but once economic and employment controls were added, the race effects were rendered non-significant (Haynie et al., 2008). These results lend support to Moffitt's prediction that African-Americans are more likely to persist in the maturity gap due to a lack of employment and economic opportunities and therefore are more likely to persist in offending. These results could also be interpreted as support for Sampson and Laub's theory because they illustrate the importance of social institutions in fostering desistance.

A final study by Higgins and colleagues (2010) tested Moffitt's snares hypothesis in a sample of African-Americans utilizing dual trajectory modeling. This study found that African-Americans who desisted more slowly from crime were using alcohol more often. This finding is interpreted as being consistent with Moffitt's state dependence prediction that antisocial behaviors may trap individuals in a life of crime by cutting off prosocial avenues for change. Alcohol use is just one of many potential snares that

Moffitt predicts may lead individuals to persist in offending over time. Unfortunately, Higgins and colleagues do not examine whether or not this relationship is the same for whites and other minority groups compared to blacks or whether this effect is unique for African-Americans.

Although the studies above seem to support the validity of some of Moffitt's predictions in samples that contain African-Americans, the extant literature assessing Moffitt's race hypothesis is clearly quite limited. Moffitt's theory has not been tested across race and ethnicity in a single, representative sample. None of the studies above can answer the question of whether or not African-Americans are more likely to be involved in both life-course persistent and adolescence-limited offending as predicted by Moffitt (1994). More research is needed to explore this issue. If Moffitt's hypothesis is incorrect and there is no evidence that minorities are more prevalent in either developmental pathway then an alternative explanation for disparate rates of minority offending is needed and the results of the studies described in this section may need to be reconsidered.

Theoretical critiques. The primary criticism of Moffitt's developmental taxonomy and offender typologies is proffered by Sampson and Laub (2003; Laub & Sampson, 2003) who argue that offender classification schemes have little value for the field of criminology because trajectories of offending change frequently but are often reified and considered concrete groups. They also argue that trajectories of offending cannot be distinguished by childhood risk factors and therefore criminologists should spend their research efforts looking for general causes of offending (Laub & Sampson, 2003). These critiques are based on Laub and Sampson's (2003) findings that all

offenders in their high-risk sample of Boston youth had desisted from offending by the time they reached age 70; that there was a great deal of heterogeneity in adult offending patterns even amongst this relatively homogeneous sample; and that adult trajectories of offending could not be distinguished using a number of childhood risk factors. Sampson and Laub took umbrage with the life-course persist label used by Moffitt although Moffitt's theory did not intend the label to suggest that offenders engaged in delinquency until the day they entered the grave (Moffitt, 2006a; 2006b; Piquero & Moffitt, 2005). Additionally, they disagree that offenders can be classified accurately as LCP based on early childhood risk-factors and argue that the LCP label ignores a considerable amount of change that occurs in antisocial behaviors in adulthood (Laub & Sampson, 2003). Moffitt (2006b) responds to all these critiques and suggests that Laub and Sampson set up a series of straw man tests of her developmental taxonomy because they only examined offenders who would have been likely to be labeled as LCP and because they misinterpreted the meaning of the life-course persistent label.

Additional criticisms for Moffitt's taxonomy stem from the trajectory findings discussed above. The aforementioned findings suggest that as many as five or six groups of offenders may exist within a given sample. While Moffitt (2006a; 2006b) suggests that these analyses generally lend support to her theory because they identify the two groups predicted by the developmental taxonomy, the theory seems to ignore the possibility that there are more than two trajectories of offending in need of explanation. Obviously, further disaggregating offenders would make for muddled explanations with little value to the field, but the fact remains that many offenders do not fit nicely into the two groups suggested by Moffitt. Moffitt (2006a; 2006b) acknowledges these findings and allows

that a third group of low-level chronic offenders and perhaps even a fourth group of adult-onset offenders may be plausible.

Summary. Moffitt's developmental taxonomy suggests that the aggregate age-crime curve masks two distinct trajectories of antisocial behavior which have very different etiologies and are both in need of explanation by criminological theory. The theory she proffers predicts that continuity and change in offending behaviors over time can be explained by two different causal processes. Continuity of antisocial behavior is explained by an interaction between individual differences and environmental factors while change in offending is predicted for the majority of offenders whose deviance is the product of adolescent status frustration and social mimicry of their antisocial peers. Moffitt's theory allows for both population heterogeneity and a state dependence explanations of the link between prior and future offending. The theory rejects the general explanations offered by Gottfredson and Hirschi and Sampson and Laub and instead adopts a developmental explanation that predicts specific causes for persistence and change in offending over the life-course. Additionally, Moffitt (1994) predicts that minorities, especially African-Americans are more likely to be in both the life-course persistent and adolescent-limited offending groups due to the consequences of structural racism and concentrated poverty.

Explaining Offending over the Life-Course across Race and Ethnicity

Throughout the preceding pages, the classification of criminological theories based on their handling of the relationship between prior and future offending and whether or not they predict that crime is best explained by general or specific causal processes has been discussed. The current study is guided by three criminological

theories which make very distinct, but sometimes overlapping predictions about the causes of crime and deviance throughout the life-course. Although their theories are in disagreement about the root causes of antisocial behavior, Gottfredson and Hirschi and Sampson and Laub appear to agree that a single explanation is capable of explaining all types of offending and offenders throughout the entire life-course (Paternoster et al., 1997). Their theories favor parsimony and predict general causal processes rather than group-specific etiologies. The key point of contention between these two control theories is whether they allow for change in offending behaviors or predict that criminal propensity is stable throughout the life-course and resistant to the impact of changing levels of social control. Alternatively, developmental theories like the one offered by Moffitt suggest that a general explanation is insufficient and multiple causal processes exist which produce very different patterns of behavior over the life-course. Developmental theorists argue that the added complexity of group-specific explanations is necessary because multiple types of offenders do in fact exist and their behaviors are the product of specific, not general, causal processes.

While these three theories make differing predictions about the role of certain theoretical covariates, there is a considerable amount of conceptual overlap between their explanatory models. For instance, all three theories stress the importance of parenting and early childhood experiences. For Gottfredson and Hirschi, parenting represents the key causal mechanism through which self-control is developed; Sampson and Laub recognize the importance of parenting in childhood, but also allow for the influence of school and peer variables in childhood and institutional social bonds in adulthood; finally, parenting plays a key role in the development of antisocial behavior for Moffitt's life-course

persistent offenders but is not predicted to be important for adolescence-limited offenders. In order to help untangle this conceptual overlap and better understand the causal mechanisms that lead to offending throughout the life-course, these theories need to be tested in the same sample, using the same analytic strategy. As Hirschi and Gottfredson (1994) note, “the primary test of a theory is its ability to organize the data in an area relative to the ability of alternative theories to organize the same data” (Hirschi & Gottfredson, 1994, 7).

The current study aims to competitively test the utility of general versus developmental theories for explaining trajectories of offending in a representative sample of adolescents and young adults from the National Longitudinal Survey of Youth 1997. Competitive testing of these theories is not unique to this study (Paternoster & Brame, 1997; Paternoster et al., 1997), however, the novelty of the current research is that it examines whether or not the causal processes predicted by these theories vary across race and ethnicity. The lack of consideration of race and ethnicity represents a major limitation of current DLC theorizing (see Piquero et al., 2002; 2007; Piquero & Moffitt, 2005). Despite race representing a central organizing principle in American society, developmental and life-course theories have generally ignored the potential role that race and ethnicity may play in shaping the behaviors of individuals across the life-course (Piquero et al., 2002). If the causal mechanisms that distinguish between offending trajectories vary across race and ethnicity then the theoretical models that guide the current research may be in need of refinement as they all predict that the explanations of offending are invariant across race and ethnicity. The current study contrasts the general explanations of Gottfredson and Hirschi and Sampson and Laub with the developmental

explanation offered by Moffitt. Additionally, the current study examines if, as predicted by all three theories, the causal processes underlying the development of offending are racially and ethnically invariant.

Chapter 4: Review of Relevant Literature

As detailed in the preceding chapters, the current study aims to explore the relationship between race and crime within the context of the developmental and life-course criminology framework. In order to address the current research hypotheses, the current study utilizes statistical methods that allow the researcher to examine race-specific developmental trajectories of offending across a key stage of the life-course. The study of the longitudinal patterning of offending has a long history within the field of criminology. In recent years, scholars have often explored the notion that there are unique groups of offenders who follow similar developmental paths of offending which may or may not have specific etiologies. These developmental trajectories of offending have been the subject of much empirical research and scrutiny. Extant empirical research has focused not only on identifying groups of offenders who follow similar developmental trajectories, but also on exploring the causal mechanisms that distinguish between these developmental trajectories. The current chapter reviews the empirical literature concerning the identification of trajectories of offending with a specific focus on extant studies that use risk and protective factors to distinguish between trajectories. The chapter concludes by reviewing studies that have explored race and ethnicity-specific developmental trajectories of offending and restating the current study hypotheses.

Developmental Trajectories of Offending

While criminologists have long been interested in the longitudinal patterning of offending, statistical techniques to model the developmental course of offending lagged behind this desire for many years. This changed with the introduction of trajectory methods (Nagin & Land, 1993) which allowed researchers to model long-term patterns of development in longitudinal datasets (Piquero, 2008). Since their introduction in the early 1990's, trajectory methods have been employed in numerous empirical studies examining a wide array of behavioral outcomes over time. A full review of these empirical studies is beyond the scope of the current study, but the general findings of these studies are discussed below.

In a review of empirical studies utilizing the trajectory methodology, Piquero (2008) identified more than 80 unique studies published between 1993 and 2005 which examined developmental trajectories of criminal activity. Perhaps the most significant message to take away from this review is the consistency of the findings across a diverse set of sample types, locations, and outcomes. Piquero's review finds that, on average, between three and five groups of offenders tend to be identified by the trajectory methodology. This finding is consistent across more than 80 studies utilizing both official and self-report data, samples from more than seven different countries, and several different outcome measures. The consistency of these findings is impressive and suggests that there is a considerable amount of generality in the findings (Piquero, 2008). Studies utilizing the trajectory methodology consistently find that groups of offenders with similar developmental trajectories can be identified within the population. The consistent finding of heterogeneity in offending patterns is supportive of taxonomic theories, but the

extant empirical evidence from trajectory studies is not fully supportive of the common two-group prediction posited by both Moffitt and Patterson. On average, three to five groups are identified with more groups likely to be identified in self-report studies and with larger samples.

Piquero's review also finds a considerable amount of consistency in the age patterns or trajectories that are identified using the trajectory method. Generally, studies employing the trajectory methodology tend to identify a low-rate offending group, and high-rate or chronic offending group, a moderate but declining group, and a late-onset offending group (Piquero, 2008, 50). While these groups are typically identified when using the trajectory methodology, it is important to note that these groups are statistical approximations and do not necessarily represent "true" groups of offenders who are perfectly classified and will never vary in their offending patterns over time. Identifying groups using the SPGM methodology is a data reduction technique that allows the researcher to summarize complex realities (Nagin, 2005). That caveat aside, there is a considerable amount of consistency in the findings from studies utilizing trajectory methods and the validity of these findings is enhanced by this convergence across a diverse set of samples and outcomes.

In sum, the trajectory methodology has been extremely popular in recent years because it allows researchers to model the development of offending behaviors over time while at the same time allowing for the identification of unique groups of offenders who follow similar trajectories. The method also allows researchers to examine the covariates that distinguish one offending trajectory from another. The method is particularly well-suited for testing theories with a taxonomic element because it examines the patterning of

offending over time in a group-based framework (Nagin, 1999). There is a great deal of consistency in the findings that have resulted from extant studies which have employed the methodology. In general, these studies identify between three and five groups of offenders in most samples and the four trajectories of offending that appear most consistently throughout the extant findings are low-rate offenders, chronic offenders, moderate but declining offenders, and late-onset offenders. After establishing that groups of offenders can be identified using the trajectory methodology, researchers began attempting to distinguish between trajectory groups using theoretical covariates and risk and protective factors.

Distinguishing Offending Trajectories

In order to better understand the developmental processes which underlie the trajectories of offending identified using group-based trajectory methods, many scholars have turned to research from the risk and protective factor paradigm which identifies key domains of covariates which influence serious and prolonged offending (Loeber & Farrington, 1998; 2000). The general idea behind the risk and protective factor paradigm is that no single risk factor can explain offending and the more risk factors (and less protective factors) that an individual experiences, the more likely they are to be involved in more serious or prolonged antisocial behavior (Loeber & Farrington, 1998; 2000). The risk factor paradigm also recognizes that the influence of risk and protective factors is age-graded. This implies that certain factors are more important than others depending on the stage of development. For instance, research suggests that individual and family factors make up the most salient risk domains in early childhood, but as children age and move towards adolescence, peer, school, and neighborhood risk domains become

increasingly important (Loeber & Farrington, 2000). The key risk domains established by risk and protective research are individual, family, school, peer, and neighborhood.

Whether risk and protective factors have general or specific effects on different trajectories of offending has become an important empirical question given the popularity of trajectory methods and the taxonomic elements of several DLC theories (Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002). In the past decade, several empirical studies have attempted to address the generality of risk and protective factors for distinguishing offending trajectories (Bersani, Nieuwbeerta, & Laub, 2009; Chung et al., 2002; Fergusson, Horwood, & Nagin, 2000; Jennings et al., 2010; Laub & Sampson, 2003; Maldonado-Molina et al., 2009; 2010; Piquero, Brame, Mazerolle, & Haapanen, 2002; Piquero et al., 2007; Wiesner & Capaldi, 2003; Wiesner & Windle, 2004). The results from these studies have been somewhat mixed, but several key findings have emerged. In general, studies examining the ability of risk and protective factors to distinguish between offending trajectories have found that “a common set of etiological factors act cumulatively to determine the individual’s probability of following a given offending trajectory” (Fergusson et al., 2000, 545). Simply put, there is not a lot of empirical evidence which suggests that different offending trajectories have unique etiologies. This is not consistent with the taxonomic theories of Moffitt or Patterson which suggest that developmental patterns of offending have specific etiologic causes.

While the finding of a general set of risk factors is not universal across the studies cited above, much of the extant empirical research that has attempted to distinguish offending trajectories using childhood covariates has been unable to distinguish between offending trajectories based on specific risk and protective factors (Bersani et al., 2009;

Chung et al., 2002; Fergusson et al., 2000; Laub & Sampson, 2003; Piquero et al., 2007). However, several studies have found that individuals in high-rate or chronic offending trajectory groups differ significantly from individuals on non-offending or very low-rate offending trajectories across several key risk domains (Chung et al., 2002; Fergusson et al., 2000; Jennings et al., 2010; Maldonado-Molina et al., 2009; 2010; Piquero et al., 2002; 2007; Wiesner & Capaldi, 2003; Wiesner & Windle, 2004). Studies distinguishing between higher rate offending groups and low-rate or non-offenders have examined a diverse set of risk and protective factors from several different theoretical models making generalizations across this body of research difficult. Risk factors that have been found to distinguish between offenders and non-offenders include: deviant peer associations (Fergusson et al., 2000; Weisner & Capaldi, 2003); poor academic achievement, unsupportive family environments, life events, and substance use (Wiesner & Windle, 2004); sensation seeking behavior, and early exposure to neighborhood violence (Jennings et al., 2010; Moldonado-Molina et al., 2009); and drug dependence (Piquero et al., 2002). Additionally, Piquero and colleagues (2007) employed a cumulative risk scale and found that offenders had higher risk scores across all domains than non-offenders (Piquero et al., 2007). Protective factors that have been shown to distinguish between offender and non-offender trajectories include lower levels of attention problems, better parental supervision, lower levels of depressive symptoms, less risky sexual behavior, lower levels of substance use (Wiesner & Capaldi, 2003) and higher stakes-in-conformity (Piquero et al., 2002). In support of the risk factor paradigm, the existing empirical studies consistently find that individuals who follow high-rate or chronic offending trajectories have the highest number and level of risk factors across all risk domains.

The finding that risk factors are able to distinguish offending trajectories from non-offending or low-rate offending trajectories has led some scholars to conclude that there is “more specificity than commonality in the correlates of distinctive offending trajectories” (Weisner & Capaldi, 2003, 231). This finding is somewhat suspect since these same authors found that few factors were able to distinguish between offending trajectories and that most differences were found between high-rate chronic offenders and non-offenders only (Weisner & Capaldi, 2003). In general, empirical research that has attempted to distinguish between offending trajectories using childhood covariates has shown that a set of general risk factors predict offending across all trajectories. There is some evidence that in addition to a general set of risk factors, there are nuanced differences that distinguish some offending trajectories from one another, but no consistent pattern has emerged. The selection of childhood covariates in the existing empirical studies has been both theoretically and data-driven, but unfortunately there has been little consistency across the studies which makes generalizing about the risk and protective factors that are most salient for distinguishing offending trajectories difficult.

In regards to the general versus developmental theory debate discussed in Chapter 3, extant findings support a middle-ground argument which suggests that offending trajectories do not have specific etiologies as predicted by Moffitt, but also that a more diverse set of causal factors than is suggested by purely general theories is required to explain offending trajectories. It would appear that the extant empirical research is most consistent with Sampson and Laub’s theory which predicts universal causation but allows for more than one underlying cause of offending; however, the risk factors that have been shown to distinguish between offending trajectories include several factors not

specifically predicted by Sampson and Laub's age-graded theory of informal social control. For instance, delinquent peer associations have been shown to be an influential risk factor for distinguishing offending trajectories (Fergusson et al., 2000; Weisner & Capaldi, 2003). Clearly, further research is needed to elucidate the mechanisms which cause antisocial behavior throughout the life-course and to better understand the risk and protective factors that distinguish offending trajectories.

Generality of risk factors across subgroups. A few empirical studies have examined if and how the ability of risk and protective factors to distinguish offending trajectories varies across gender or cultural context. Although it is not directly relevant to the current study, this literature is discussed briefly here because the current analyses are also focused on exploring the generality of risk and protective factors across subgroups. Although there are a limited number of studies that have attempted to examine this issue, the results of these research efforts suggest that there are more similarities than differences in ability of risk and protective factors to distinguish offending trajectories across sub-groups and cultural contexts. Maldonado-Molina and colleagues (2009) compared offending trajectories across two samples of Hispanic youth; one born in the United States and one born in Puerto Rico. Their trajectory analyses yielded a five-group model for the American-born sample compared to a four-group model in the foreign-born sample. Despite differences in number of offending trajectories identified, the role of risk and protective factors were found to be more similar than different across the two samples. Among both samples, sensation seeking and exposure to neighborhood violence distinguished between offender and non-offender trajectories (Maldonado-Molina et al., 2009). In a follow-up to this study, Jennings and colleagues (2010) examined if and how

the ability of risk factors to distinguish offending trajectories varied across gender at either site. Their findings revealed that there were more similarities than differences in the effects of risk factors on offending trajectories across gender and location. In the American-born sample, the same risk factors distinguished between offending trajectories for both males and females. Also, higher levels of risk factors predicted involvement in higher-rate offending trajectories for both males and females alike. In the foreign-born sample, risk factors distinguishing offending trajectories were also the same across gender (Jennings et al., 2010). These findings led to the conclusion that the ability of risk factors to distinguish offending trajectories does not vary considerably across gender. The primary observed difference between males and females in the two samples was that males typically exhibited higher levels of both offending and risk factors (Jennings et al., 2010).

While these two studies by Maldonado-Molina, Jennings, and colleagues have taken an important step towards better understanding how the effects of risk and protective factors on offending trajectories vary across subgroups, this body of research is still in its infancy. Very few studies to date have explored whether or not risk and protective factors distinguish offending trajectories differently across race and ethnicity. The current study aims to bridge this gap in the literature by exploring the relationship between risk and protective factors and offending trajectories across race and ethnicity in a nationally representative sample of individuals followed from adolescence through emerging adulthood. While extant research has rarely explored the generality of risk and protective factors for distinguishing offending trajectories across race and ethnicity, some

recent research has explored racial and ethnic differences in offending trajectories in general (Cohen, Piquero, & Jennings, 2010; Reitzel, 2006).

Racial Differences in Offending Trajectories

As noted in the opening chapter, developmental life-course criminology has generally ignored the role that race may play in shaping the offending behaviors of individuals throughout the life-course (Piquero et al. 2002). Similarly, racial and ethnic differences in offending trajectories have not often been explored despite a need for research that examines whether or not the processes suggested by DLC theories vary by race and ethnicity (Chung et al., 2002; Piquero, 2008). Research has also failed to explore whether or not the ability of childhood covariates to distinguish offending trajectories varies by race (Wiesner & Capaldi, 2003). While several studies have examined gender differences in offending trajectories (Broidy et al., 2003; D'Unger, Land, & McCall, 2002; Piquero, Brame, & Moffitt, 2005) and the invariance of risk factors for distinguishing offending trajectories across gender (Jennings et al., 2010), only two studies to date have explored race differences in offending trajectories (Cohen et al., 2010; Reitzel, 2006).

Utilizing data from the Second Philadelphia Birth Cohort on more than 27,000 individuals born in 1958, Cohen and colleagues (2010) estimated offending trajectories from ages 8-26 disaggregated by race and ethnicity. They found several interesting differences as well as a number of similarities across the disaggregated models. The whites-only trajectory model yielded two trajectory groups, non-offenders and low-rate offenders. In contrast, the African-American-only and Hispanic-only models yielded three trajectory groups respectively. In the African-American cohort, a third group which

evinced a steady and moderate pattern of offending emerged in contrast to the two group model for whites. In general, the Hispanic cohort displayed very low rates of offending. The three-group model for Hispanics included a non-offender group, an adolescence-peaked group, and a group whose offending peaked in early adulthood before decreasing with age (Cohen et al., 2010).

Further analysis of the disaggregated trajectory groups indicated that African-Americans had much higher rates of offending overall, especially within the third group of moderate, steady offenders. The prevalence of non-offenders (83%) was the same for whites and African-Americans, but African-Americans in offending groups offended at higher rates than whites in the offending group. Hispanics displayed the lowest prevalence of non-offenders (75%), but also displayed very low rates of offending amongst the offending groups. The higher-rate offending group among Hispanics offended at a higher rate than the white offending group (Cohen et al., 2010). From these analyses, the authors concluded that aggregate offending trajectories may mask important racial and ethnic differences in offending participation and frequency that may underlie aggregate offense trajectories. They also find that there are different peak ages of offending across race and ethnicity and therefore conclude that “by disaggregating trajectories by race/ethnicity we may be obtaining a more accurate picture of sub-group offending patterns that are masked in aggregate offending patterns” (Cohen et al., 2010, 164).

The primary limitation of the Cohen et al., study is that their data comes from one city only and therefore their findings may not be generalizable to other cities across the U.S. The current study overcomes this limitation by examining offending trajectories

disaggregated by race and ethnicity in a nationally representative sample. Additionally, as the focus of their study was not on distinguishing offending trajectories, Cohen and colleagues did not examine whether the ability of risk and protective factors to distinguish offending trajectories varies across race and ethnicity. Whether or not there are racial and ethnic differences in the impact of childhood covariates on offending trajectories is an important empirical question in need of further investigation (Wiesner & Capaldi, 2003).

An additional study, a doctoral dissertation by Reitzel (2006) also examined race and ethnicity-specific trajectories of offending. Reitzel utilized a sample of 524 high-risk offenders who were tracked for seven years following parole from the California Youth Authority (CYA). In addition to looking at trajectories of total offending, Reitzel also examined race-specific trajectories of offending disaggregated for violent and non-violent offenses. His findings revealed several similarities and some key differences across the racially disaggregated trajectory models. For total offending, Reitzel identified four offending trajectories for whites, four for blacks, and three for Hispanics. Despite finding one less group in the Hispanic sample, the patterns of offending were very similar across the race-specific models. Reitzel found that a larger proportion of whites were classified as chronic offenders, but that blacks in the chronic group committed about one more offense per year relative to whites in the chronic group.

In the non-violent offending models, Reitzel identified four groups of offenders for whites compared to three groups each for blacks and Hispanics. The three groups that were consistent across all three models followed very similar patterns of non-violent offending; however, the fourth group, identified for whites only, offended at a higher rate

than any of the groups in the black or Hispanic model. In the violent crime models, Reitzel identified two trajectories of offending for whites, blacks, and Hispanics alike. The key difference across the violent offending models was that blacks in the persistent offending group averaged slightly over one new violent offense per year while whites and Hispanics in the persistent offending group averaged only .6 new violent offenses per year. Overall, Reitzel's findings suggest that there is a great deal of similarity in trajectories of offending across race and ethnicity; however, there are some key differences as well that emerge most clearly when models are disaggregated by offense type. Consistent with prior research, Reitzel's findings suggest that blacks may commit violent offenses more frequently than whites or Hispanics, while whites may commit property crimes more frequently than blacks or Hispanics.

In addition to examining trajectories of offending, Reitzel also explored the utility of childhood risk factors for distinguishing offending trajectories across race and ethnicity in the CYA sample. Findings from the risk factor analyses suggested that IQ, age at first arrest, paternal criminality and sibling criminality significantly distinguished overall offending trajectories for whites while family structure and family welfare distinguished overall offending trajectories for blacks. Only juvenile drug use distinguished overall offending trajectories among Hispanics. In the disaggregated models, some additional individual-level and family-level risk factors emerged as significant predictors of group membership, but overall, there was little consistency in the factors that distinguished offending trajectories both across race and ethnicity and across disaggregated offense types leading to the conclusion that risk and protective factors do

not fare particularly well in distinguishing offending trajectories across race and ethnicity.

The primary limitations of Reitzel's study concern the study sample. The study utilized a fairly small sample of high-risk offenders from one state only bringing in potential questions regarding the generalizability of findings beyond California and beyond high-risk, previously incarcerated offenders. It is possible that risk factors did not distinguish offending trajectories as well as predicted due to the fact that the entire sample was already at a higher level of risk relative to the general, non-incarcerated population. Limitations aside, the works of Reitzel and Cohen and colleagues point to several interesting similarities as well as some substantial differences regarding trajectories of offending across race and ethnicity. The current study aims to contribute to this body of research concerning race differences in offending trajectories and the factors that distinguish trajectories across race and ethnicity by examining these issues within the NLSY97 sample.

A few additional studies that do not directly assess racial and ethnic differences in offending warrant mention for their relevance to the current research. Although they do not assess racial differences in offending trajectories, the aforementioned studies by Maldonado-Molina, Jennings, and colleagues assess offending trajectories across multiple Hispanic samples. Prior to these studies, little was known about offending trajectories among Hispanics and whether or not similar trajectories of offending that were identified among whites could be found in Hispanic populations. Overall, their findings are fairly consistent with the findings reviewed in Piquero (2008) which suggest that studies utilizing the trajectory method typically identify between four and six groups

of offenders. For both samples from the United States, Maldonado-Molina and colleagues (2009; 2010) found that a five-group trajectory model fit best for both offending trajectories and trajectories of physical aggression. After disaggregating by gender, Jennings et al., found four groups of offenders in both the male and female samples from the United States and three groups for both males and females in the Puerto Rico-based sample (Jennings et al., 2010). These findings suggest that patterns of offending within Hispanic samples are likely to be more similar to, rather than different from, patterns of offending found in white-only and mixed-race samples. Additionally, these studies also assessed the ability of risk factors to distinguish offending trajectories within Hispanic samples. Findings across all three studies suggest that several risk/protective factors (e.g., thrill-seeking, attitudes towards delinquency, delinquent peers, poor school environment, and exposure to violence) significantly distinguish offenders from non-offenders in Hispanic samples (Jennings et al., 2010; Maldonado-Molina et al., 2009; 2010). These studies represent a key step forward towards including race and ethnicity within the discussion of offending trajectories and DLC. The current study looks to build on the momentum provided by these studies to expand the discussion further to include African-Americans and to test for racial and ethnic differences in the ability of risk and protective factors to distinguish offending trajectories in a single nationally-representative sample.

Foundations of the Current Study

The literature reviewed above suggests that there is a considerable amount of consistency in the findings from studies utilizing the trajectory methodology (Piquero, 2008). Across diverse samples from several countries utilizing multiple outcome measures, the trajectory methodology has been shown to have a great deal of utility for

addressing research questions with a taxonomic element. The extant empirical literature suggests that there is a considerable amount of heterogeneity in developmental patterns of offending and that these patterns may vary to some degree across sub-groups.

Furthermore, a considerable amount of extant empirical research has been focused on exploring whether or not offending trajectories have unique etiologies as predicted by developmental theorists or whether a general set of risk factors distinguish all offending trajectories as predicted by general theories. In general, the results from these studies suggest that a core set of risk factors predict all offending trajectories; however, the risk factors that distinguish offending trajectories are not limited to those predicted by any particular extant general theories. The generality of risk factors is supported across sub-groups as well; and there is also some evidence that risk factors are salient cross-culturally. On the whole, risk factors fair better at distinguishing offending from non-offending trajectories as opposed to distinguishing between groups with varying levels of offending.

Although very little research has explored racial and ethnic differences in offending trajectories, the issue has been addressed by at least two empirical studies (Cohen et al., 2010; Reitzel, 2006). The findings from Cohen and colleagues' study suggest that aggregate trajectories of offending may mask important racial and ethnic differences in the longitudinal patterning of offending across the life-course. Additionally, this study found that African-Americans offended at a much higher rate than whites and Hispanics, but that prevalence in offending groups did not vary greatly across race and ethnicity (Cohen et al., 2010). Only one study to date has explored the ability of risk and protective factors to distinguish offending trajectories across race and

ethnicity (Reitzel, 2006) and the results of that study were somewhat inconclusive regarding this issue. The current study represents an attempt to expand on the preliminary findings regarding the ability of risk and protective factors to distinguish offending trajectories across race and ethnicity.

Chapter 5: Methods

This chapter is devoted to describing the research design and methodology of the current study. The first part of this chapter provides a statement of the primary study hypotheses. This is followed by a section describing the NLSY 1997 data and the age cohort that was utilized in the current research; the strengths and limitations of the data are also discussed. After describing the data, the study measures are discussed and the analytic strategy is laid out. The chapter concludes with a discussion of the semiparametric group-based mixture modeling (SPGM) approach to estimating developmental trajectories and a detailed description of how this method is utilized in order to address the current study research questions.

Hypotheses

Based on the literature reviewed in Chapter 4, the current study aims to test several empirically and theoretically relevant hypotheses. The study hypotheses are numbered here and are summarized in Table 2. H1: The current study predicts that there will be more similarities than differences across offending trajectories disaggregated by race and ethnicity. More specifically, the current study expects to find between three and five trajectories of offending for all three racial and ethnic subgroups. While there is a potentially large difference between a three and a five-group model, it is predicted that a similar number of groups will be identified for each racial and ethnic subgroup. This prediction is grounded in the empirical literature reviewed above which illustrates the

consistency of the findings from trajectory analysis across samples, cultures, and subgroups. Subtle differences are anticipated in terms of the shape of offending trajectories, but overall, it is predicted that offending patterns will not differ greatly across race and ethnicity. Extant research indicates that the four most commonly observed offending trajectories include a high-level chronic trajectory, an adolescent peaked trajectory, a late-onset or low-level chronic trajectory, and a non-offender trajectory. Based on these findings, the current study anticipates finding trajectories that closely resemble these patterns across race and ethnicity. Consistent with the findings of Cohen et al., (2010) and predictions by Moffitt (1994; 2006b) the current study will also explore the possibility that African-Americans are more likely to be involved in chronic and adolescent-limited offending trajectories. H2: Consistent with Moffitt's hypothesis and the findings of Cohen and colleagues, the current study predicts that African-Americans will be overrepresented in both offending trajectories predicted by Moffitt's developmental taxonomy.

Two additional hypotheses concern the ability of risk factors to distinguish offending trajectories both in general and across race and ethnicity. H3: Based on the extant literature and consistent with general theories, it is predicted that risk factors will predict offending trajectories generally. Contrary to Moffitt's theory, the current study does not anticipate finding trajectory-specific etiologies. If trajectories are predicted by a set of general risk factors, general theories are supported over developmental theories. H4: Additionally, the current study predicts that the same general set of risk and protective factors will distinguish offending trajectories across race and ethnicity. More specifically, the current study predicts that the same risk factors will distinguish offenders

from non-offenders across all three race/ethnicity cohorts, but the levels of risk factors will vary significantly across racial and ethnic subgroups with minorities experiencing higher levels of risk. This prediction is consistent with previous research that has found that the salience of risk factors does not vary greatly across subgroups. Additionally, this hypothesis is grounded in research that suggests that developmental processes do not vary across race and ethnicity and that the development of delinquency follows common developmental pathways across race and ethnicity (Rowe, Vazsonyi, & Flannery, 1994).

Table 2

Research Questions and Hypotheses

Research Questions	Hypotheses
Q1: Are there different trajectories of offending observable across race and ethnicity?	H1a: There will be more similarities than differences in general patterns of offending across race and ethnicity in the NLSY97 sample H1b: Between 3 and 5 groups of offenders will be identified for whites, blacks, and Hispanics alike
Q2a: Are the two developmental trajectories predicted by Moffitt's (1993) developmental taxonomy identified across racial and ethnic groups? Q2b: Are blacks more prevalent in offending trajectories as predicted by Moffitt (1994)?	H2a: More than two offending trajectories will be identified within all three race groups, but Moffitt's two groups will be among the trajectories identified H2b: Blacks will be overrepresented in offending trajectories
Q3: Do theoretically derived risk factors distinguish offending trajectories generally, or are risk factors trajectory-specific?	H3: Risk factors will predict offending trajectories generally
Q4: Do risk factors vary in their ability to distinguish offending trajectories across race and ethnicity?	H4: The same general set of risk factors will distinguish offending trajectories across race and ethnicity H5: structural-level risk factors will be more salient for minorities relative to whites

One additional hypothesis is proffered that is somewhat contrary to the prediction of racial/ethnic invariance in the influence of risk factors. H5: The current study predicts that structural/neighborhood-level risk factors will be more salient for minorities relative to whites. This prediction is grounded in research that suggests that neighborhood-level risk exacerbates the influence of other risk factors on offending for African-Americans but not for whites (Piquero et al., 2005). Alternatively, it is possible that structural risk factors are simply more prevalent in minority neighborhoods (Sampson, 1997; Sampson & Wilson, 1995).

In addressing these hypotheses, the current study aims to gain a better understanding of the relationship between race and crime as it plays out over the life-course. Additionally, this research looks to elucidate the mechanisms that distinguish offending trajectories across race and ethnicity in order to explore whether general or race-specific developmental processes underlie observed patterns of offending.

Data

In order to address the issue of racial and ethnic differences in trajectories of offending and examine the risk factors that predict these offending patterns, the current study utilizes data from the National Longitudinal Survey of Youth 1997 (NLSY97). The NLSY97 is one of six studies in the National Longitudinal Surveys (NLS) program sponsored by the Bureau of Labor Statistics. The survey was designed to be representative of people living in the United States in 1997 who were born between 1980 and 1984 (Center for Human Resource Research, 2003; Moore et al., 2000). Eligible participants were between the ages of 12 and 16 as of December 31, 1996. The original sample size at wave 1 included 8,984 respondents. This sample consisted of two

subsamples: a cross-sectional sample of 6,748 respondents designed to be representative of the general target population and a supplemental sample of 2,236 respondents which was designed to oversample Hispanic and black populations born between 1980 and 1984 (Moore et al., 2000). In order to recruit the desired sample, interviewers screened 75,291 households in 147 non-overlapping primary sampling units (Moore et al., 2000). The NLSY97 was administered to any household members who met the selection criteria and gave consent.

The initial NLSY97 survey sample consisted of 4,599 (51%) males and 4,385 (49%) females. The supplemental oversampling of minority populations resulted in a sample that was 51.9% non-black/non-Hispanic, 26% black, 21.2% Hispanic, and .9% of mixed race. The oversampling procedure helped ensure accurate representation of different subpopulations based on race, income, region, and other desired factors (Center for Human Resource Research, 2003). The initial survey had a response rate of 91.6% and over 82% of the sample was retained through the twelfth wave of the data collection in 2008.

The current study utilizes a subsample of the original NLSY97 data. In order to examine the same developmental period for all participants, the current study selected a cohort of individuals from the NLSY97 who were 13 or 14 years of age at their first interview in 1997. By limiting the sample to individuals from this one age cohort, the current study is able to examine developmental trajectories over the same period of the life-course for all participants. While this limits the overall sample size, it is justifiable because trajectories examined from age 13 may be very different from trajectories examined from age 17. After excluding cases that did not fit into any of the three

race/ethnicity groups of interest and cases with missing delinquency data at all time points, this resulted in a sample of 3,416 youth. The demographics of the 13-14 year old cohort are consistent with the full NLSY97 sample. The study cohort is 51% male, 52% white, 27% black, and 21% Hispanic. Individuals who reported their race as Asian/Pacific Islander, Native American, Eskimo, or Aleutian, or as mixed race were excluded from the current analyses. The average age of cohort members is 13.5 at first interview. The developmental trajectories examined in the current study track these cohort members between 1998 and 2008 when they are between 14.5 and 24.5 years of age on average. This observation period represents a key developmental stage and allows the current study to examine race-specific trajectories of offending from mid-adolescence through the transition into adulthood; a period during which extant research has suggested that race differences in offending may be most pronounced (Elliott, 1994).

There are two features of the NLSY97 that make these data particularly well-suited for addressing the current research objectives. First, the NLSY97 utilizes a multi-wave panel design that follows the same individuals over time. This allows the current study to examine within-individual and between-individual differences in offending over a key period of the life-course. The second appealing feature of the NLSY97 is the oversampling of racial and ethnic minorities. This oversampling allows the current study to examine race and ethnic-specific trajectories of offending within a single sample. A primary limitation of extant empirical tests of DLC theories and studies utilizing group-based trajectory modeling is the lack of consideration of race and ethnicity (Piquero, 2008; Piquero et al., 2002) within a single nationally-representative sample. The current

study is able to overcome this limitation because the NLSY97 includes large samples of both African-Americans and Hispanics.

An additional feature of the NLSY97 data that is appealing for the current study is the inclusion of survey items that measure involvement in delinquency across the full study period. In addition to repeated measures of delinquency, the NLSY97 also includes information on several risk and protective factors that are relevant to the current study. These risk and protective factors span individual, family, peer, school, and neighborhood domains and allow the current study to examine a number of key theoretical covariates that may predict trajectories of offending across race and ethnicity.

While the NLSY97 data have several appealing features, they are not without limitations. Two limitations of particular relevance to the current study include the heavily skewed nature of the data concerning the frequency of offending and the lack of previously validated scales measuring key independent variables. While the data do include information on offending frequency, the distribution of these data is highly skewed and overall, there is a low rate of offending. In examining the offending frequency data, it became evident that the data were so heavily skewed that they were essentially dichotomous. Within the study cohort, 46% of the respondents reported no offenses over the 11 waves of the study observation period and 75% averaged less than one offense annually. An additional limitation of the data is that they do not include any official measures of delinquency which could be used to validate self-reports. Some concern over validity of self-reports in the data is alleviated by the fact that the NLSY97 employed an audio computer-assisted self-interview (ACASI) which allowed respondents to answer questions privately so that their responses were not heard by caregivers or NLS

staff. This technique has been found to increase the validity of self-report responses and reduce bias that may result from social desirability (Center for Human Resource Research, 2003).

Measures

Dependent variable. The dependent variable used in the current study is an indicator of self-reported *delinquency prevalence* measured between 1998 (when respondents were an average age of 14.5) and 2008 (when respondents were 24.5 years of age on average). The variable is measured at each wave between wave 2 and wave 12 of the NLSY97 data collection. The delinquency prevalence measure reflects whether or not each respondent was involved in drug, property, or violent offending at each wave of the observation period. The delinquency prevalence variable included seven offenses in 1998 and eight offenses in subsequent waves. These offenses included three drug offenses covering both drug use and drug sales; four indicators of property offending; and a single item measure of violent offending (a full list of delinquency items is included in Appendix A). Each respondent reported if they had committed any of the offenses since the time of their last NLSY interview (approximately 1 year). All items were dichotomous and the delinquency prevalence measure reflects involvement in any of the eight potential offenses.

Offending prevalence is an appropriate outcome measure given the aims of the current study to examine racial differences in patterns of offending over the life-course and to examine the generality of risk factors for predicting offending trajectories both in general and across race and ethnicity. More specifically, this measure allows for a direct test of Moffitt's (1994) prediction that racial differences in offending behaviors are likely

to be manifested in the form of a higher prevalence of African-Americans in both the life-course persistent and adolescence-limited offending trajectories. Research from the criminal career paradigm also suggests that aggregate racial differences in offending patterns more likely reflect differences in prevalence as opposed to offending frequency (Blumstein et al., 1986; 1988). Elliott (1994) also predicts that the racial differences in offending that are observed in official statistics most likely reflect a greater prevalence of African-Americans involved in delinquency over a longer period of time than white offenders.

Clearly it is debatable as to whether differences in frequency or prevalence are more important for understanding racial differences in offending. The current study examines differences in offending prevalence, but acknowledges that differences in frequency may exist even if differences in prevalence do not. In order to account for the potential disparity between prevalence and frequency of offending, the current study examines the mean frequency of offending across both race and ethnicity and trajectories of offending prevalence. This allows the current study to account for racial differences in both prevalence and frequency of offending.

Independent variables. Consistent with prior research predicting offense trajectories (Chung et al., 2002; Jennings et al., 2010; Maldonado-Molina et al., 2009; 2010; Piquero et al., 2007; Wiesner & Capaldi, 2003; Weisner & Windle, 2004), the current study identifies a number of relevant covariates which are used to distinguish between offending groups identified using the SPGM method. The selection of risk and protective factors was guided by the theoretical framework discussed in Chapter 3. The selected risk and protective factors span across individual, family, peer, school, and

neighborhood domains (see Chung et al., 2002; Loeber & Farrington, 2000). Data on all risk and protective factors was collected at the first NLSY interview (1997) when the respondents were 13.5 years of age on average. The covariates listed below are used to distinguish offending trajectories and to examine whether the development of offending varies across race and ethnicity.

Demographics. *Gender*, and *race/ethnicity* are included as demographic risk factors in bivariate and multivariate analyses. Gender is coded 1 for males and 0 for females so that male gender represents a risk factor for involvement in delinquency. Race/ethnicity has three categories; white, black, and Hispanic. The white category is used as the reference group in regression models. The race/ethnicity risk factor is used to distinguish offending trajectories for the full sample but is excluded from race specific analyses. The current study also examines the effect of prior involvement in offending as a risk factor by utilizing a *prior delinquency* variety score measured at wave 1 of the NLSY. This delinquency measure reflects how many of 10 potential delinquent acts respondents had ever engaged in prior to their first NLSY interview. The delinquent acts included in this item ranged from status offenses like running away from home to violent acts like attacking someone with the intention of seriously harming them. The average delinquency score was 1.55 for the full sample. The final multivariate regression models are estimated with and without controlling for prior delinquency. This allowed the current study to examine the effect of the covariates with and without controlling for prior behavior.

Individual factors. Four individual-level risk factors are included in the current analyses. *Impulsivity* – An impulsivity scale was created from three youth-report items.

Male impulsivity and female impulsivity reflect different items due to the questions asked in the original survey. Male impulsivity items included “you have trouble concentrating or paying attention”, “you don’t get along with other kids”, and “you lie or cheat”. Female impulsivity items included the lies or cheats question and two other questions; “your school work is poor”, and “you have trouble sleeping”. For each item, respondents reported if this was “not true” “sometimes true” or “often true”. The responses were coded 0-2 and the scale was created by summing the scores of the three items for males and females respectively. Impulsivity scale values range from 0-6 with higher values representing more impulsivity. The internal consistency of the male and female impulsivity scales was assessed ($\alpha = .59$ for males; $\alpha = .47$ for females). Internal consistency was also assessed across race and ethnicity ($\alpha=.43$ for white males; $\alpha=.36$ for black males; $\alpha=.48$ for Hispanic males; $\alpha=.44$ for white females; $\alpha=.31$ for black females; $\alpha=.25$ for Hispanic females). These alphas are below suggested cutoff values (Cronbach, 1951) indicating a potential lack of internal consistency of the impulsivity scale; however, alpha values are dependent on the number of items in the scale and the size of the sample and therefore it is not surprising that the internal consistency of this three-item measure is somewhat questionable. The low alphas for some subgroups (e.g., Hispanics females) are likely influenced by the small sample sizes in these groups. In order to help preserve model parsimony, the impulsivity scale is included in the multivariate analysis despite a potential lack of internal consistency.

Two measures of cognitive ability were included to assess Moffitt’s prediction that low cognitive functioning is a primary predictor of life-course persistent offending.

Cognitive functioning – During round 1 of the NLSY97, most respondents participated in

the administration of the computer-adaptive form of the Armed Services Vocational Aptitude Battery (CAT-ASVAB). Utilizing scores on the Arithmetic Reasoning, Mathematics Knowledge, Paragraph Comprehension, and Word Knowledge subsets of the ASVAB, National Longitudinal Surveys (NLS) staff created a math/verbal percentile score for each respondent who completed the test battery. The NLS math/verbal percentile score allows for comparisons to be made across respondents in terms of cognitive functioning. Respondents were grouped into three-month age cohorts and percentile scores were created for each respondent in comparison to other members of their age cohort. Math/verbal percentile score values range from 0 to 100. Higher scores on this measure reflect higher cognitive functioning relative to other cohort members and should be negatively related to chronic offending if Moffitt's prediction is correct. In addition to the ASVAB scores, the current study also includes a parental report measure of childhood learning disabilities. *Learning disability* – This single-item measure asks parental respondents to report if their child “does now have or has ever had a learning or emotional problem that limits or has limited the kind of schoolwork or other daily activities he or she can perform, the amount of time he or she can spend on these activities, or his or her performance in these activities?” Moffitt's taxonomy predicts that early neurobiological deficits, which may be manifested as childhood learning disabilities, interact with environmental factors to produce life-course persistent offending.

Early arrest – The final individual-level covariate is a dichotomous indicator of early onset of official delinquency. This single-item indicator asks respondents if they have “ever been arrested by the police or taken into custody for an illegal offense”.

Measured at the first interview, this risk factor indicates an official arrest (self-reported) before the age of 13.5 on average for the cohort. Early onset of official delinquency has been shown to be predictive of a longer criminal career (see e.g., Blumstein et al., 1986) and is suggested by Moffitt (1993; 2006b) as a potential predictor of life-course persistent offending.

Family factors. The theories of Gottfredson and Hirschi, Sampson and Laub, and Moffitt all stress the importance of parenting. Parental attachment and parental monitoring were included as family-level predictors of offense trajectories. These youth-report measures reflect the quality of the parent-youth relationship and the monitoring of youth behavior by parents. NLSY97 recorded data separately for mothers and fathers of each youth. The current study utilizes youth-report data about maternal attachment and maternal monitoring. The maternal attachment and maternal monitoring variables were originally developed by Child Trends Inc. in conjunction with the Center for Human Resource Research at Ohio State University. *Maternal attachment* – The maternal attachment scale includes eight items. In the first three items, youth were asked to indicate how highly they think of their mother, how much they want to be like her, and how much they enjoy spending time with her. These items were answered on a five-point Likert scale and responses were coded 0-4 with 4 representing the strongest agreement. Additionally, youth were asked to indicate how supportive their mother is of them. Among these five items youth were asked to report how often their mothers “praise them for doing well” and how often she “helps you do things that are important to you”. These responses were also coded on a five-point scale ranging from 0-4 with 0 indicating never and 4 representing always. The responses to the eight items were summed and scores on

the maternal attachment scale ranged from 0-32 with higher scores indicating greater maternal attachment (see Child Trends, Inc., 1999). The internal consistency of the scale was assessed ($\alpha = .75$).

Maternal monitoring – The maternal monitoring variable reflects four items which asked youths about how much their mothers knew about their close friends and about their whereabouts when they are not at home. The responses to these four items were measured on a five-point scale with values ranging from 0-4 with 4 representing more maternal knowledge of the child’s activities and friends. The scores for the four items were summed to form a maternal monitoring variable with potential values ranging from 0-16 where higher scores indicated higher levels of maternal monitoring (see Child Trends, Inc., 1999). Internal consistency of the scale was reported by Child Trends Inc. ($\alpha = .71$).

Peers. While Gottfredson and Hirschi and Sampson and Laub downplay the influence of peers on adolescent delinquency, Moffitt’s theory predicts that adolescent-onset offending can be explained by the interaction between the maturity gap and antisocial peer models (see Moffitt, 1993). *Perceived peer delinquency* – While a direct measure of peer influence is not available in the NLSY97 at the first interview, the data does include information about each respondent’s perceptions about the percentage of their classmates who are involved in several forms of delinquency. From these questions, a perceived peer delinquency risk factor was created. The survey questions asked respondents to report the percentage of the kids in their grade who smoked cigarettes, got drunk at least once a month, belonged to a gang, used illegal drugs, and cut classes or skipped school. For each of the five items, youth responses were dichotomized so that if

the youth reported that half or more of the kids in their grade were involved in that form of delinquency they were assigned a 1, representing higher risk. The five dichotomous items were then summed to create a perceived peer delinquency risk scale with values ranging from 0-5. A higher score on the peer risk scale represents greater perceived peer involvement in delinquency. The internal consistency of these five items was adequate ($\alpha = .75$; $.76$ for whites; $.72$ for blacks; $.76$ for Hispanics). While this measure does not directly measure peer associations, it does serve as an indicator of a greater prevalence of antisocial models during adolescence; the developmental stage where Moffitt predicts that offending is often the result of social mimicry of antisocial peers.

Structural factors. Sampson and Laub predict that attenuated school bonds are important predictors of offending during adolescence. *School environment* – While a direct measure of school bonding is not available in the NLSY97, the current study utilizes a measure of school environment derived from five youth-report items regarding their school experiences. The five indicators used to create the school environment variable asked students about their teachers (e.g., “the teachers are good”, “the teachers are interested in their students), the discipline they received (e.g., “the discipline is fair”), and whether or not they felt safe in their school. These five items were originally measured on a four-point Likert scale. All five items were dichotomized and then summed to create a school context variable with values ranging from 0-5, where higher values indicate a more positive school experience/greater school attachment ($\alpha = .60$; $.63$ for whites; $.56$ for blacks; $.54$ for Hispanics). As was the case with the impulsivity scales, the alphas for the school environment scale are fairly low indicating a potential lack of internal consistency. The scale reflects several domains of school environment and it is

possible that multiple measures of these constructs would be more appropriate, but in order to preserve parsimony, the scale was included in multivariate analyses rather than five single-item measures of school environment.

The current study includes three environmental risk factors. *Environmental risk index* – The first is an environmental risk index which measures the quality of the youth's home and neighborhood environment as reported by both the youth and the NLS interviewer who conducted the interview. This index was developed by researchers at Child Trends for inclusion in the NLSY97 data at wave one. The environmental risk index was developed from two youth-report and three interviewer-report items collected at the first interview. The two youth-report items asked respondents whether or not their home usually had heat and electricity when they needed it during the past month and how many days they heard gunshots in their neighborhood in a typical week. If youth reported not typically having heat or electricity during the last month they were assigned a value of 1 indicating risk. If youths reported hearing gunshots at least once a week during a typical week they were assigned a value of 1 indicating risk. Two of the interviewer-report items asked the interviewer to rate how well kept the neighborhood and home of the youth were on a scale of 0-2, with 2 representing a poorly kept environment and a higher level of environmental risk. The final index item was a dichotomous indicator which reflected whether or not the interviewer was concerned for their safety in the neighborhood or home of the respondent. The five items were summed resulting in an index of environmental risk with values ranging from 0-7 with higher values representing greater environmental risk.

Neighborhood disorganization – A second structural risk factor is a dichotomous indicator of neighborhood disorganization. While a direct measure of neighborhood social disorganization was not available in the NLSY97, there was an indicator of whether or not respondents reported that there were gangs in their neighborhood. The presence of unsupervised teens in a community has been shown to be a good indicator of neighborhood disorganization (see Sampson & Groves, 1989). Additionally, the presence of gangs can serve as a proxy indicator of living in a lower class, high-crime neighborhood as extant research consistently shows that gang activity is more common in disadvantaged neighborhoods. From a theoretical standpoint, both Sampson and Laub (1997) and Moffitt (1994) predict that individuals who grow up in disadvantaged neighborhoods are at an increased risk for becoming ensnared and experiencing cumulative continuity/cumulative disadvantage. Therefore, neighborhood disorganization is predicted to be positively related to prolonged involvement in delinquency.

Household poverty – The final environmental risk factor is an indicator of household poverty recorded during the first wave of NLSY data collection. The household poverty risk factor is coded so that 1 represents individuals from households where the household income was at or below the poverty line during the year prior to the first interview. Moffitt (1994) predicts that poverty is an important risk factor for life-course persistent offending because it increases the likelihood that children are born with neurobiological deficits and limits the opportunities to correct or properly deal with such deficits. Additionally, poverty is predicted to exacerbate the effects of cumulative disadvantage and lead to prolonged delinquency.

Analytic Strategy

The current study analyses proceeded in three stages. The first stage of the analyses included a series of mean difference tests which were conducted in order to examine whether or not there were racial/ethnic differences in offending prevalence over eleven waves of the NLSY97 data. In order to show that the decision to employ a dichotomous indicator of offending involvement did not greatly change the study findings, mean frequencies of offending were also assessed and compared across race and ethnicity and across offending trajectories. Additionally, mean levels of risk and protective factors were compared across race and ethnicity in order to examine whether or not there were significant differences in levels of risk and protective factors across the three race/ethnicity cohorts.

After risk profiles were assessed, the current study estimated general and race-specific trajectories of offending prevalence using semiparametric group-based mixture modeling (SPGM) to assess whether there was evidence of heterogeneity in the development of offending over time in the study sample and if developmental processes varied by race and ethnicity (see Nagin & Land, 1993; Nagin, 1999; 2005). There is consistent empirical evidence which indicates that there is heterogeneity in offending trajectories throughout the life-course (see Piquero, 2008 for a review) and there is also evidence that heterogeneity of offending trajectories exists across racial and ethnic subgroups (Cohen et al., 2010; Reitzel, 2006).

After estimating offending trajectories across race and ethnicity, the current study proceeded to examine the mean level of the risk and protective factors across trajectory

groups in each model. This was done to examine group mean differences in key risk and protective factors.

The final stage in the analytic procedure of the current study involved the estimation of a series of multinomial logistic regressions to explore if and how the selected risk and protective factors were able to distinguish between the offending trajectories derived from the SPGM analyses. More specifically, this step involved regressing the groups identified in the SPGM analyses onto the risk and protective factors in order to examine whether the covariates were able to distinguish one developmental trajectory from another as predicted by Moffitt, or if a single set of covariates predicted all offending trajectories as predicted by the general theories of Gottfredson and Hirschi and Sampson and Laub. Further, the ability of these covariates to predict offending trajectories was examined across race and ethnicity in order to address the research question of whether or not the same risk and protective factors are predictive of offending for all racial and ethnic subgroups or whether unique factors are needed to predict offending across race and ethnicity. The multivariate analyses proceeded in two stages. In the first stage, the trajectory groups were regressed onto the risk factors from each risk domain separately in a series of regression models. This was done in order to examine the influence of key risk domains in isolation before controlling for the factors from other domains. This allowed the current study to examine the relative importance of factors from each domain for distinguishing offending trajectories. The second stage of the multivariate analyses involved regressing the trajectory groups onto the full set of risk and protective factors simultaneously. The full models were calculated both unadjusted and adjusted for prior involvement in delinquency. This process was done in order to

examine the effects of the covariates with and without the influence of prior delinquent behavior in the model (Jennings, Maldonado-Molina, Reingle, & Komro, 2011). This allows the current study to explore the influence of other theoretically relevant risk factors before controlling for prior delinquency which is well-established as one of the strongest predictors of future delinquency.

Identification of developmental trajectories. The current study utilized the SPGM modeling approach developed by Nagin and colleagues (see Nagin & Land, 1993; Nagin, 1999; 2005). An application of finite mixture modeling, the method was developed to aid researchers in identifying “subgroups within a population that follow distinctive developmental trajectories that are not identifiable *ex ante* on the basis of some measured set of individual characteristics” (Nagin, 2005, 1). The modeling strategy identifies clusters of individuals who have similar developmental patterns of a behavior in question. The method overcomes the limitations that are inherent when attempting to classify groups of offenders based solely on a priori knowledge. In the current study, this method is preferred over alternative methods for modeling developmental trajectories (hierarchical linear modeling, latent growth curve analysis) because rather than assume that trajectories vary continuously throughout the population, Nagin’s method assumes that there are relatively homogeneous clusters of developmental trajectories that underlie the distribution of development within the population (Nagin, 2005). This makes the method particularly well-suited for addressing research questions with a taxonomic element like the ones in the current study. The method can test whether or not the unique trajectories predicted by taxonomic theories like Moffitt’s are in fact present in the

population and also allows researchers to examine the covariates that underlie each trajectory (Nagin, 1999; 2005).

Nagin's SPGM methodology allows researchers to model how behavior changes over time in a group-based framework. This makes the methodology particularly appealing for the current study. Additional strengths of the SPGM method that make it appropriate for addressing the current research agenda are that it provides an indication of the probability of assignment to each group and assigns individuals to the groups where their probability of belonging is highest; it also allows for assessment of comparative model fit using several model fit indices so that the best fitting model can be selected; it avoids a priori or ad hoc classification of individuals based on characteristics other than offending; and it is capable of handling a diverse array of data formats including binary outcomes like the ones assessed in the current analyses.

The SPGM process. In order to estimate developmental trajectories, the current study employed the SAS-based PROC TRAJ procedure developed by Nagin and colleagues (see Jones, Nagin, and Roeder, 2001). PROC TRAJ is a macro that runs in conjunction with SAS statistical software. Because it uses a number of different estimation procedures, the program is able to estimate developmental trajectories within several different data distributions. The modeling procedure can accommodate censored data utilizing the censored normal (CNORM) estimator, count data utilizing the zero-inflated Poisson (ZIP) estimator, and binary data utilizing the binary logit (LOGIT) estimator (Jones, Nagin, and Roeder, 2001; Nagin, 2005). Additionally the program is able to estimate up to a third-order polynomial in age which allows the shapes of

offending trajectories to vary within a single model. These features allow the user to find the best-fitting model for their specific longitudinal data.

Estimating SPGM trajectories involves an iterative process that allows the researcher to estimate the best fitting model by comparing it to alternative models. In this process, the researcher typically compares each model to a model with one additional group. The first step in the model selection process is to specify the form of model to be estimated. In this step, the researcher specifies the number and shape of the trajectories to be included in the model. Typically, the researcher will start by estimating a two-group model and proceed to add groups to the model until the BIC is maximized (the formula for calculating the BIC is provided below; for a full discussion of the BIC see Nagin, 2005, Chapter 4). Decisions regarding the number of groups are guided by the BIC and other fit indices, but also require substantive and theoretical knowledge in order to select the best-fitting model that also provides the most relevant and appropriate findings.

In addition to the BIC, PROC TRAJ also provides mean posterior probabilities which help assess goodness of model fit. The average posterior probabilities (AvePP) provide an indication of how well individuals have been assigned to the groups yielded from SPGM procedure. If all individuals were perfectly assigned, then the value of the AvePP for each group would be equal to 1. Since perfect model selection is unlikely, there is variability in the AvePP. Nagin (2005) recommends a cut-off value of .7 for all groups. A value of .7 would suggest that, on average, individuals assigned to a given group have a probability of .7 of belonging to that group rather than another group (see Nagin, 2005, 88). In other words, a value of .7 would indicate that on average,

individuals assigned to that group had a 70% chance of being in that group as opposed to another group.

As the researcher is specifying models with varying numbers of groups they simultaneously specify the shapes of the trajectories that will be estimated in the model. Researchers can specify cubic, quadratic, linear, or zero-order trajectories. One way to execute this step is to start by specifying the most complex model (one in which all trajectories are specified as cubic) and then simplifying the model with each iteration until the model converges significantly and the BIC is maximized or mean posterior probabilities drop below the .7 cutoff. Additionally, if there is substantive reasoning to predict that there should be a zero-order group (e.g., the data is censored at zero) then researchers may choose to specify this at the onset of the model estimation process.

Because the current study examines binary outcome measures, it utilized the LOGIT estimator available in the PROC TRAJ program. The current study followed the iterative model selection process discussed above. For each set of trajectories estimated, model selection was assessed using the BIC, average posterior probabilities, and substantive knowledge. When the BIC was ambiguous or ambiguity in group membership became problematic, the more parsimonious model was favored.

Relevant SPGM formulas. In order to calculate developmental trajectories, the SPGM method calculates an unobserved latent variable which represents each individual's (*i*'s) potential for engaging in the behavior of interest at a given age (*t*). This latent variable is represented by the symbol y_{it}^* . The formula for calculating y_{it}^* is:

$$y_{it}^* = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \beta_3^j \text{Age}_{it}^3 + \varepsilon_{it}$$

This equation represents a cubic relationship between y_{it}^* and age. In this formula, Age_{it} , Age_{it}^2 , and Age_{it}^3 represent the individuals age, age squared, and age cubed at each time point. ε_{it} is the error term, and $\beta_0^j - \beta_3^j$ are parameters that determine the shape of the trajectories (Nagin, 2005, 28-29). This equation defines the offending trajectories that are estimated. The shapes of the trajectories are manipulated using this formula until the best fitting model is specified.

The current study examines two binary dependent variables and therefore it will utilize the binary logit distribution estimation procedure. The binary logit estimator utilizes the latent variable (y_{it}^*) described above. In this model, it is assumed that if the binary outcome occurred at a given time, then $y_{it} = 1$; if the binary outcome did not occur at a given time, then $y_{it} = 0$. The formula for the binary logit distribution is:

$$\alpha_{it}^j = \frac{e^{\beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2 + \beta_3^j Age_{it}^3}}{1 + e^{\beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2 + \beta_3^j Age_{it}^3}}$$

In this equation, α_{it}^j is the probability that the latent variable $y_{it} = 1$, given that an individual is in group j . For each trajectory group j , α_{it}^j is estimated at each time point over the observation period. This process yields trajectories which indicate the probability that each individual i in each group j was engaged in the behavior being examined at each time point t (Nagin, 2005, 35-36).

In order to assess model fit and guide model selection, the SPGM procedure utilizes the Bayesian Information Criterion (BIC) (see Nagin, 2005, 63-66). The formula for the BIC is:

$$BIC = \log(L) - 0.5k \log(N)$$

In this formula, L represents the maximum likelihood, N is the overall sample size and k is the number of parameters in the model which reflects both the number of groups being estimated and the shape of the trajectories that are specified by the user before the model is estimated (Nagin, 2005). In the model selection process, the goal is to maximize the value of the BIC (i.e., make it closer to 0). By multiplying the equation by the number of parameters in the model, the BIC rewards parsimony (in this case a simpler model with fewer groups/lower polynomial functions).

One final tool in the model selection process is the calculation of the posterior probabilities of group membership (see Nagin, 2005, Chapter 5). The posterior probabilities of group membership provide an indicator of each individual's i probability of belonging to group j , given their observed behavior at each time t during the observation period. The formula for the calculation of the posterior probabilities of group membership is:

$$\hat{P}(j|Y_i) = \frac{\hat{P}(Y_i|j)\hat{\pi}_j}{\sum_j \hat{P}(Y_i|j)\hat{\pi}_j}$$

In this equation, $\hat{P}(j|Y_i)$ is an indicator of the probability of an individual i being assigned to group j given their observed pattern of behavior (Nagin, 2005, 79).

Estimation of trajectories in the current study. Consistent with the binary nature of the outcome measure, the developmental trajectories that result from the process described above indicate the probability of involvement in offending for each group at each time point. A total of four trajectory models were estimated. First, a general model of delinquency for the entire 13-14 year old cohort was estimated. Subsequently, three race-specific offending trajectory models were estimated. This second step resulted in

three sets of developmental trajectories which reflect offending patterns for all three racial and ethnic subgroups between ages 14.5 and 24.5. Results are examined both within and between the racial and ethnic subgroups. Once the trajectories were estimated, the groups that were identified were exported and used as outcomes in multinomial logistic regression models. This process allows the current study to address whether or not there are racial differences in developmental trajectories of self-reported offending and whether or not risk and protective factors distinguish offending trajectories generally or differentially across race and ethnicity. This procedure is aimed at better understanding the relationship between race/ethnicity and offending over the life-course. Additionally, this procedure allowed the current study to critically assess the predictions made by general versus taxonomic theories of offending.

Chapter 6: Results

The current study explored racial and ethnic differences and similarities in offending trajectories and assessed the ability of risk and protective factors to distinguish trajectories both in general and across race and ethnicity. This chapter presents the study findings and relates them back to the study hypotheses and extant empirical research. The sections that follow describe the prevalence and frequency of offending within the study sample, present mean differences in risk and protective factors across race and ethnicity, explicate the results of the SPGM trajectory models for the full and racially-disaggregated samples, present mean differences in risk and protective factors across offending trajectories, and present the results of multinomial logistic regressions examining the ability of covariates to distinguish offending trajectories across race and ethnicity.

Prevalence of Self-Reported Offending

Before examining trajectories of offending, the current study examined the prevalence of self-reported offending across waves 2-12 of the NLSY97 data. The prevalence of offending was examined for the full sample and separately for all three racial and ethnic subgroups. Results of these analyses are provided in Table 3. The average offending prevalence across waves 2-12 for the full sample was 35.6%. On average, across the 11 waves, whites reported the greatest prevalence of offending ($\bar{x} = 38.6\%$) compared to African-Americans ($\bar{x} = 31.9\%$) and Hispanics ($\bar{x} = 32.9\%$)

respectively. Chi-square analyses indicated that there were significant racial differences in offending prevalence between waves 3 and 9 of the observation period.

Table 3

Prevalence of Past Year Self-Reported Offending by Wave and Race/Ethnicity

Wave (age)	Full Sample (n=3,416)	White (n=1,776)	Black (n=914)	Hispanic (n=726)	χ^2
2 (14.5)	37.1 %	38.2 %	34.2 %	37.9 %	4.07
3 (15.5)	36.4 %	38.6 %	32.7 %	35.5 %	8.57*
4 (16.5)	35.3 %	38.2 %	30.6 %	34.2 %	14.49*
5 (17.5)	35.0 %	38.3 %	30.7 %	32.3 %	16.57*
6 (18.5)	32.1 %	35.6 %	28.1 %	28.3 %	19.76*
7 (19.5)	30.4 %	33.9 %	27.7 %	25.1 %	20.34*
8 (20.5)	38.9 %	46.5 %	27.2 %	34.8 %	20.85*
9 (21.5)	40.2 %	44.5 %	36.8 %	33.5 %	7.17*
10 (22.5)	37.4 %	40.2 %	34.2 %	34.4 %	3.21
11 (23.5)	35.0 %	37.8 %	33.2 %	30.2 %	3.89
12 (24.5)	34.1 %	33.2 %	35.0 %	35.3 %	.39
	$\bar{x} = 35.6 \%$	$\bar{x} = 38.6 \%$	$\bar{x} = 31.9 \%$	$\bar{x} = 32.9 \%$	

* $p < .05$

Contrary to study hypotheses, the greatest prevalence of offending was observed for whites at all waves with the exception of wave 12 when whites were surpassed by both African-Americans and Hispanics. The peak period of offending prevalence for whites was observed between the ages of 20 and 23. Offending prevalence for African-Americans also peaked around the age of majority while Hispanic offending prevalence peaked at the beginning of the observation period when respondents were 14-16 years of age.

Frequency of self-reported offending. Within the literature informing the relationship between race and crime there is debate as to whether observed racial differences in offending behaviors more strongly reflect differences in prevalence or differences in frequency of offending between racial and ethnic groups. In order to

address the possibility that racial and ethnic differences in the frequency of offending were being overlooked because the current study focused primarily on offending prevalence as an outcome, the current research calculated the mean frequency of total offending across the 11 waves of the observation period and compared these mean frequencies across race and ethnicity in a one-way ANOVA. The mean offending frequency presented in Table 4 reflects the total number of acts committed by each respondent over all waves divided by the number of waves for which that respondent was included in the NLSY sample. An aggregated group-mean was then calculated for the full sample and each racial and ethnic subgroup.

The results of the frequency analyses are consistent with the general pattern that is observed in the prevalence model; whites (7.03) report a higher mean frequency of offending than blacks (4.30) and Hispanics (4.85) across the study period. Post hoc analyses indicated that the mean frequency of offending for whites was significantly greater than the mean frequency of offending for blacks, but not significantly different than the mean frequency of offending for Hispanics. When combined with the findings regarding prevalence of self-reported offending, these results indicate that, within this cohort from the NLSY97, whites are more likely to be involved in offending and offend at a higher rate than minorities over the full observation period.

Table 4

Mean Frequency of Self-Reported Offending by Race and Ethnicity

Full Sample (n=3,416)	White (n=1,776)	Black (n=914)	Hispanic (n=726)	F	Tukey's b
5.84	7.03	4.30	4.85	4.72*	W>B

* $p < .01$

Mean Differences in Risk and Protective Factors across Race and Ethnicity

A series of one-way ANOVA's were run in order to assess mean-level differences in risk and protective factors across race and ethnicity. Results from these analyses indicated that, consistent with previous research, virtually all of the risk and protective factors varied significantly across race and ethnicity with minority groups typically being more at-risk than whites (Table 5). There were no significant racial or ethnic differences in age, gender, or prior delinquent involvement; whites reported involvement in more types of delinquency than either blacks or Hispanics, but differences were not significant across groups. Hispanics scored significantly higher on the impulsivity scale than both whites and African-Americans, were significantly more likely to live in neighborhoods with gangs than whites or African-Americans, and along with African-Americans were more likely to live in poverty than whites. African-Americans were significantly more likely to have reported being arrested before their first NLSY interview than whites, reported higher levels of perceived peer delinquency and a poorer quality school environment than whites and Hispanics respectively, and scored higher on the environmental risk index than whites and Hispanics. Mean values for whites were significantly higher than African-Americans on all four protective factors (cognitive functioning, maternal attachment, maternal monitoring, and school environment) and significantly higher than Hispanics for cognitive functioning and maternal monitoring. The only risk factor that was more prevalent among whites than either minority group was the parental-report measure of learning disability. These findings are consistent with prior research that indicates that minorities experience higher levels of risk factors than whites (Farrington et al., 2003).

Table 5*Group Mean Differences in Risk and Protective Factors by Race and Ethnicity*

Variable	Full Sample (n=3,416)	White (n=1,776)	Black (n=914)	Hispanic (n=726)	F	Tukey's b
Age	13.52	13.52	13.53	13.50	.68	None
Gender	.51	.53	.50	.50	1.14	None
Prior Delinquency	1.55	1.62	1.47	1.49	2.11	None
Impulsivity	1.62	1.56	1.60	1.80	9.92*	H > B, W
Cognitive Functioning	44.97	56.15	29.41	34.80	299.38*	W > B, H; H > B
Learning Disability	.11	.13	.11	.08	4.75*	W, B > H
Early Arrest	.06	.05	.08	.07	4.55*	B > W
Maternal Attachment	24.95	25.23	24.55	24.78	6.40*	W > B
Maternal Monitoring	10.16	10.50	9.79	9.80	19.34*	W > B, H
Perceived Peer Delinquency	1.38	1.21	1.69	1.42	28.60*	B > H, W; H > W
School Environment	4.18	4.32	3.85	4.23	54.22*	W, H > B
Environmental Risk Index	1.36	.95	2.01	1.58	169.77*	B > H, W; H > W
Neighborhood Disorganization	.45	.36	.50	.59	63.57*	H > B, W; B > W
Household Poverty	.24	.11	.41	.40	169.33*	H, B > W

* $p < .05$

Trajectory Estimations

In the second stage of the analysis, semiparametric group-based mixture modeling (SPGM) was employed to calculate offending trajectories in order to assess whether there was heterogeneity in the development of offending over time in the study sample and if patterns of offending development varied by race and ethnicity. Consistent with the first study hypothesis, there were more similarities than differences in the patterns of offending that were observed across race and ethnicity. A four-group model fit the data best for the overall sample, the white sample, and the black sample while a three-group model fit best for the Hispanic sample. As noted in Chapter 5, model selection was guided by fit indices (e.g., BIC, mean posterior probability assignments) and by substantive knowledge. Table 6 displays the mean and median posterior probabilities and group assignments for all four models. Mean posterior probabilities (AvePP's) were all above the .7 cutoff indicating good precision in the assignment of individuals to offending trajectories (Nagin, 2005). Precise group assignment is particularly important when employing the classify-analyze approach utilized in the current study (Roeder, Lynch, & Nagin, 1999).

Model selection. Utilizing the iterative process described in Chapter 5, the model selection process began by fitting models with varying number of groups and comparing each new model to a model with one fewer group until the BIC was maximized or the AvePP's dropped below the .7 cutoff indicating a lack of precision in group assignment. For the full sample, the BIC continued to improve marginally as the number of groups specified increased between 2 and 6; however, mean posterior probabilities dropped below the .7 cutoff when a fifth and sixth group were added (Table 7). It is also important

to note that although the BIC rewards parsimony, it also has a tendency to favor models with additional groups (Nagin, 2005). Based on these fit indices and the observation that adding the additional groups did not add substantive meaning to the findings, the more parsimonious four-group model was selected. This process was repeated for the race-specific models (see Tables 8-10). The model selection process is described in more detail below.

Table 6

Mean (Median) Posterior Probabilities for Group Assignments

Group Assignment	Prob. G1	Prob. G2	Prob. G3	Prob. G4
Full Sample				
G1 (n = 1714; 50.2%)	.89 (.98)	.04 (.01)	.06 (.01)	.01 (.00)
G2 (n = 384; 11.2%)	.05 (.00)	.74 (.76)	.15 (.12)	.06 (.02)
G3 (n = 831; 24.3%)	.11 (.03)	.08 (.03)	.75 (.78)	.06 (.01)
G4 (n = 487; 14.3%)	.01 (.00)	.07 (.03)	.09 (.03)	.83 (.91)
Whites				
G1 (n = 820; 46.2%)	.90 (.98)	.05 (.02)	.05 (.01)	.00 (.00)
G2 (n = 242; 13.6%)	.04 (.00)	.75 (.78)	.15 (.11)	.06 (.02)
G3 (n = 440; 24.8%)	.09 (.02)	.08 (.03)	.77 (.81)	.06 (.00)
G4 (n = 274; 15.4%)	.00 (.00)	.06 (.02)	.09 (.03)	.85 (.92)
Blacks				
G1 (n = 534; 58.4%)	.89 (.97)	.03 (.01)	.08 (.02)	.00 (.00)
G2 (n = 91; 10.0%)	.05 (.01)	.72 (.73)	.15 (.12)	.08 (.02)
G3 (n = 217; 23.7%)	.13 (.05)	.08 (.04)	.72 (.72)	.07 (.01)
G4 (n = 72; 7.9%)	.00 (.00)	.10 (.05)	.09 (.03)	.81 (.88)
Hispanics				
G1 (n = 388; 53.4%)	.89 (.97)	--	.11 (.03)	.00 (.00)
G3 (n = 213; 29.4%)	.11 (.04)	--	.79 (.81)	.10 (.03)
G4 (n = 125; 17.2%)	.00 (.00)	--	.13 (.06)	.87 (.94)

Self-Reported Offending Trajectories

Full sample. Figure 1 displays the results of the SPGM analysis for the full study sample. The best fitting model identified four trajectories of self-reported offending prevalence. Group 1 (G1) represents 50.2% of the sample and has the lowest probability

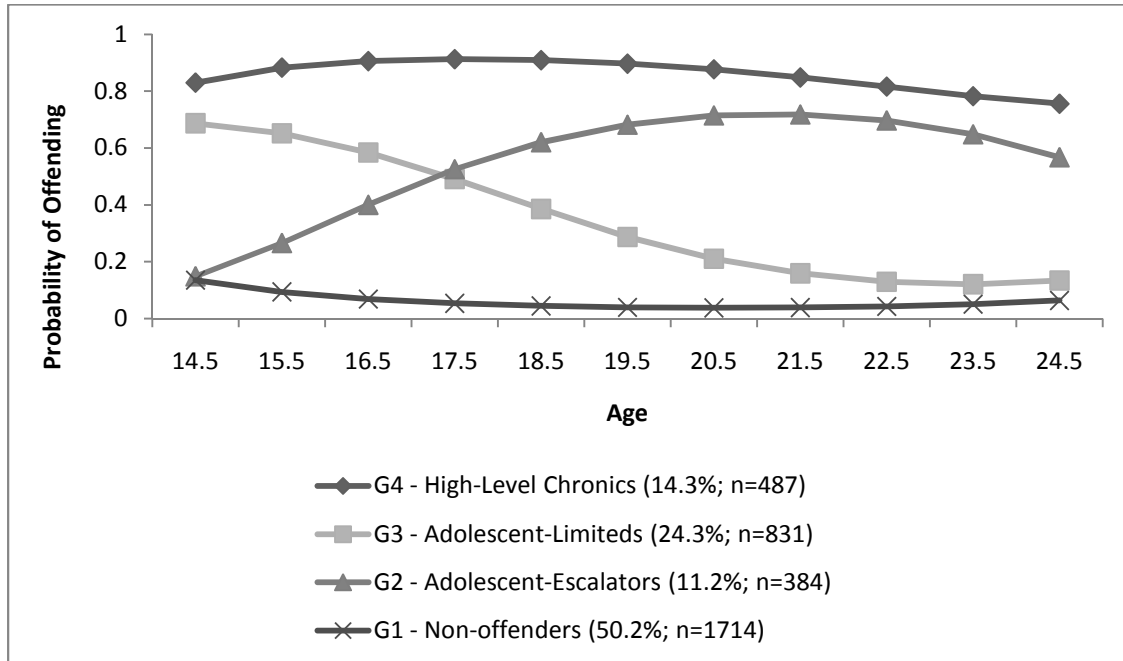


Figure 1. Trajectories of Self-Reported Offending – Full Sample (n=3,416).

of involvement in offending across the 11 measurement waves. This group is labeled as non-offenders; the observed probability of offending for this group peaks at the initial observation point (.13) and drops below .10 for the duration of the observation period. Group 2 (G2), representing 11.2% of the sample, has an initially low probability of involvement in offending (.13) that escalates throughout adolescence and peaks at age 21.5 (.72) before beginning to decline in young adulthood. This group is labeled as adolescent-escalators because their probability of involvement in offending is initially very low but steadily increases across study waves. A third group is identified (G3) which accounts for 24.3% of the sample. This group has an initially high probability of involvement in delinquency (.69) that declines with each subsequent wave. By the end of the observation period this groups' probability of offending is only slightly above the group labeled non-offenders. Group 3 is labeled as adolescent-limiteds because this

trajectory follows Moffitt's (1993) predicted path that peaks in adolescence and declines steadily with the onset of young adulthood. A fourth group (G4) is identified which displays a stable and high probability of involvement in offending throughout the study period. Representing 14.3% of the sample, this group has an initial probability of involvement of .83; the probability of involvement for this group peaks at age 17.5 (.91) and remains the highest for any of the four observed groups throughout the study period. Due to this high probability of involvement in offending and the stability of this trajectory, this group is labeled as high-level chronics.

As noted above, the four-group model was selected over a five or six-group model. Table 7 illustrates that the BIC continued to improve (move closer to zero) as the additional groups were added to the model; however, the mean posterior probabilities of group membership for some of the groups slipped below the .7 threshold. Selecting a model with a high level uncertainty surrounding group assignment is problematic because ambiguity in group assignment can bias results when employing the classify-analyze approach (Roeder et al., 1999). In addition to statistical reasons for selecting the more parsimonious model, substantive judgment was utilized as well. The primary difference between the four and five-group models was that the adolescent-limited trajectory (G3) that was observed in the four-group model was split into two trajectories that both peaked in adolescence and declined steadily throughout the study period in the five-group model. These two trajectories were nearly parallel and it was determined that they did not add enough meaning to the model in order to justify violating the precision criterion and further complicating the model.

Table 7

Model Fit Indices for Self-Reported Offending Trajectories – Full Sample (n=3,416)

# of Groups	BIC (n = 22,978)	BIC (n = 3,416)	AvePP's
2	-12574.95	-12566.37	.94, .93
3	-12317.65	-12306.22	.88, .79, .85
4	-12194.14	-12177.93	.89, .74, .75, .83
5	-12154.89	-12135.83	.70, .84, .71, .65, .77
6	-12153.59	-12129.77	.71, .80, .68, .69, .73, .68

The finding of four offending trajectories within the full study sample is consistent with the first study hypothesis and with previous research utilizing the trajectory methodology (Piquero, 2008). The shape of the observed trajectories is also consistent with what has been observed in other samples. Consistent with prior research, a chronic, an adolescent-peaked, a later-onset, and a non-offending trajectory were identified. Additionally, the findings identified two trajectories that resembled those proposed by Moffitt (1993) and a late-onset trajectory acknowledged by Moffitt (2006a; 2006b). The identification of heterogeneity in the development of offending is consistent with developmental theories; later study analyses explore whether or not the risk factors that distinguish these trajectories are different as proposed by developmental theories or universal as proposed by general theories.

White sample. The race-specific trajectories for the white sample are displayed in Figure 2. As was the case with the full study sample, a four-group solution fit the data best. While a few subtle differences were observed in the whites-only model, overall the results for whites were extremely consistent with the patterns observed in the aggregate model. For whites, Group 1 (G1), representing 46.2% of the sample, includes the individuals with the lowest probability of being involved in offending across all 11 waves

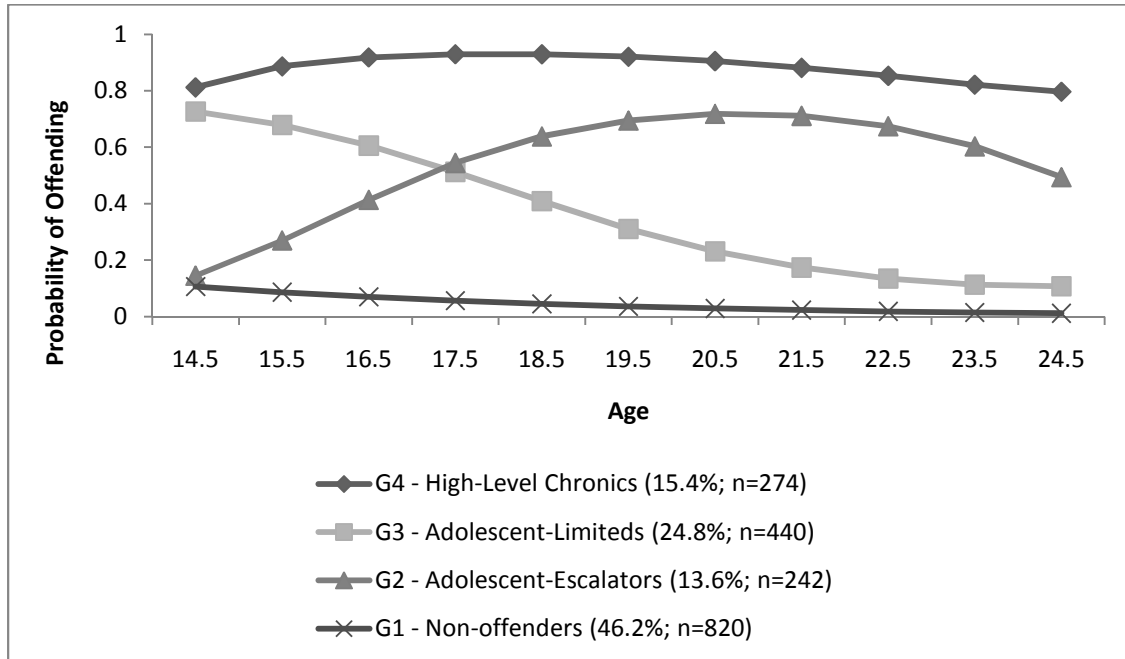


Figure 2. Trajectories of Self-Reported Offending – White Sample (n=1,776).

of the observation period. This group is again labeled as non-offenders due to their low probability of involvement in offending across time. The proportion of individuals in this group for whites is 4% lower than in the aggregate model suggesting that whites are more likely to be involved in offending than the rest of the sample. A second group (G2) which represents 13.6% of the white sample has a low initial probability of offending that increases steadily until age 20.5 before declining gradually through the end of the observation period. This group is labeled as adolescent-escalators and closely mirrors the pattern of the second group in the aggregate model. A third group (G3) of offenders who appear to follow an adolescent-limited trajectory (24.8%) is identified as well. The probability of offending for this group reached its peak (.73) at the beginning of the observation period and declined steadily in subsequent waves. The proportion of individuals in this group (24.8%) is virtually identical to the proportion observed in the

full model (24.3%). A fourth group (G4; 15.4%) starts with the highest probability of involvement in offending and maintains an elevated likelihood of involvement throughout the study period. Although the peak age of offending for this group is at age 17.5 their probability declines only slightly over time and remains high (.80) through the end of the study period. Consistent with the aggregate model, the fourth group is labeled as high-level chronics because of their high probability of involvement in offending even in young adulthood when the rest of the sample has shown evidence of declining involvement in offending.

Table 8

Model Fit Indices for Self-Reported Offending Trajectories – White Sample (n=1,776)

# of Groups	BIC (n = 11,984)	BIC (n = 1,776)	AvePP's
2	-6660.70	-6654.02	.93, .93
3	-6475.84	-6466.30	.88, .83, .87
4	-6414.94	-6399.67	.90, .75, .77, .85
5	-6398.97	-6380.83	.73, .84, .70, .65, .78
6	-6385.35	-6369.12	.70, .82, .64, .66, .62, .78

Black sample. Figure 3 displays the offending trajectories for the black sample. Consistent with the full and white samples, a four-group model fit the data best. The first group (G1; 58.4%) is again labeled as non-offenders. The initial probability of offending for this group (.18) is higher than what is observed in the aggregate and white models, but overall this group has a low probability of being involved in offending throughout the study period. A key difference observed in this model concerns the proportion of the sample in the non-offender group. The proportion of the sample in the non-offender category for blacks is about 10% greater than the proportion of non-offenders in the white sample. This finding suggests that African-Americans in this cohort are more likely than

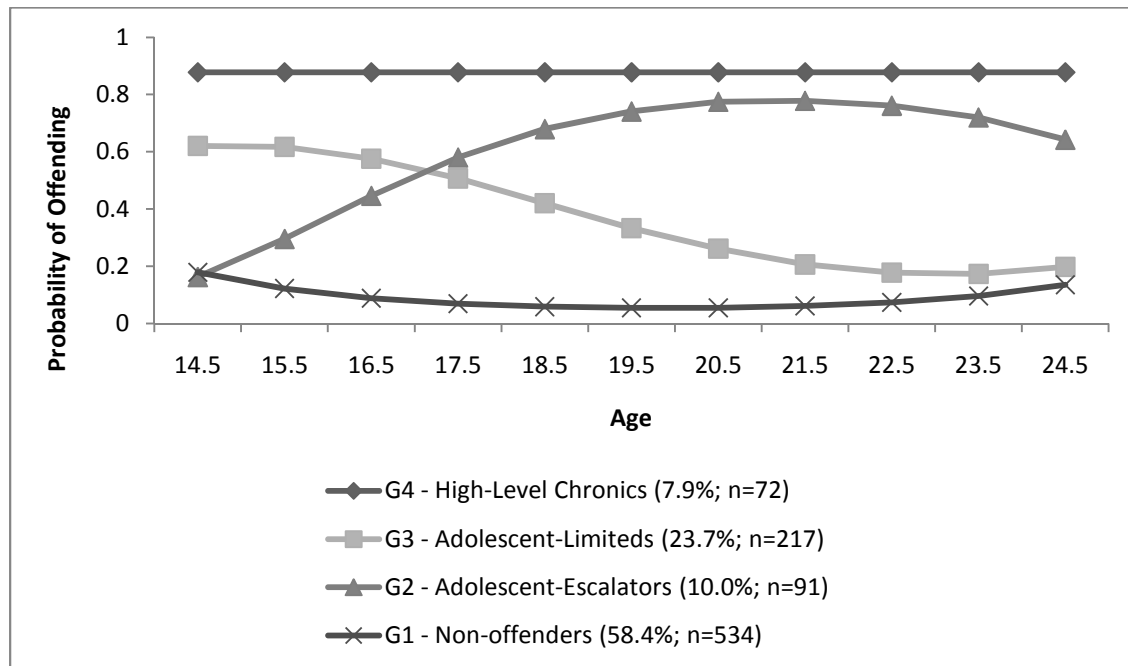


Figure 3. Trajectories of Self-Reported Offending – Black Sample (n=914).

whites to be classified as non-offenders based on self-reported measures of offending prevalence. A second group (G2; 10.0%) again displays a trajectory that begins low and increases steadily into the early twenties before declining over the last few waves of the observation period. As was the case in the aggregate and white models, this group was labeled as an adolescent-escalator trajectory. Despite the observed decline in early adulthood, the probability of involvement in offending remains relatively high for this group at the end of the observation period (.64 at wave 12). Comparatively, the probability of involvement in offending for the adolescent-escalator group in the white sample is .50 at wave 12. A third group (G3; 23.7%) is identified which again follows a pattern that can be classified as an adolescent-limited trajectory peaking at the beginning of the observation period and declining steadily over time. The proportion of the black sample in this group mirrors what is found in the aggregate and white samples. The

Table 9

Model Fit Indices for Self-Reported Offending Trajectories – Black Sample (n=914)

# of Groups	BIC (n = 6,163)	BIC ¹ (n = 914)	AvePP's
2	-3368.56	-3361.88	.95, .92
3	-3343.03	-3335.39	.82, .74, .86
4	-3329.27	-3315.91	.89, .72, .72, .81
5	-3325.17	-3309.91	.67, .76, .74, .72, .78
6	-3329.39	-3315.08	.68, .67, .67, .62, .65, .73

probability of involvement in offending at the final wave of observation is about 9% higher for this group compared to the adolescent-limited trajectory observed for whites. This suggests that while a similar proportion of both samples follow an adolescent-limited trajectory, desistance may be a slower process for African-Americans on this trajectory than it is for whites. The fourth group, (G4; 7.9%) which is labeled as a high-level chronic trajectory, is somewhat different from the high-level chronic trajectories identified in the white and aggregate models. In the black sample, this group is about half the size of the corresponding group in the white sample, but this trajectory displays more stability in the black sample than it does in the white sample. In fitting the data, this trajectory was best modeled by an intercept-only function. Although this group is considerably smaller in the black sample compared to the white sample, this trajectory does not show any decline in the probability of involvement in offending through the end of the study observation period. This suggests that within these data there is a small group of African-American offenders whose probability of offending remains high (.88) through the age of 24.5.

Overall, these findings do not support the second study hypothesis which, consistent with Moffitt (1994), predicted that African-Americans would be

disproportionately represented in the adolescent-peaked and chronic offending trajectories. The findings do appear to provide some support for Elliot's (1994) hypothesis that African-Americans persist in offending longer than whites. Additionally, the findings are consistent with Reitzel's (2006) finding that four trajectory groups were identified for whites and blacks alike and that the observed patterns of offending were more similar than different across race and ethnicity when general offending outcomes were examined.

Hispanic sample. The trajectories for the Hispanic sample are displayed in Figure 4. While a four-group model fit the data best for the aggregate, white, and black samples, a three-group model fit best for the Hispanic sample. The primary difference between the Hispanic trajectories and those observed for whites and blacks was the lack of identification of an adolescent-escalator trajectory (G2 in the other models). The other three trajectories observed for Hispanics follow similar patterns to those found in the aggregate and other race-specific models.

In the Hispanic sample, the first group (G1; 53.4%) is again labeled as a non-offender trajectory with an initial probability of involvement in offending of .14. Over the course of the remaining observation period, the probability of offending for this group remains below .10. The next group (29.4%), labeled G3 in Figure 4 in order to make comparisons easier down the road, begins with an initial probability of involvement in offending of .55 that decreases steadily over the subsequent waves of observation. This trajectory is labeled as adolescent-limited. The adolescent-limited trajectory for Hispanics has a somewhat elevated probability of involvement in offending at the end of the observation period (.22) compared to the adolescent-limited group for whites (.11), but a

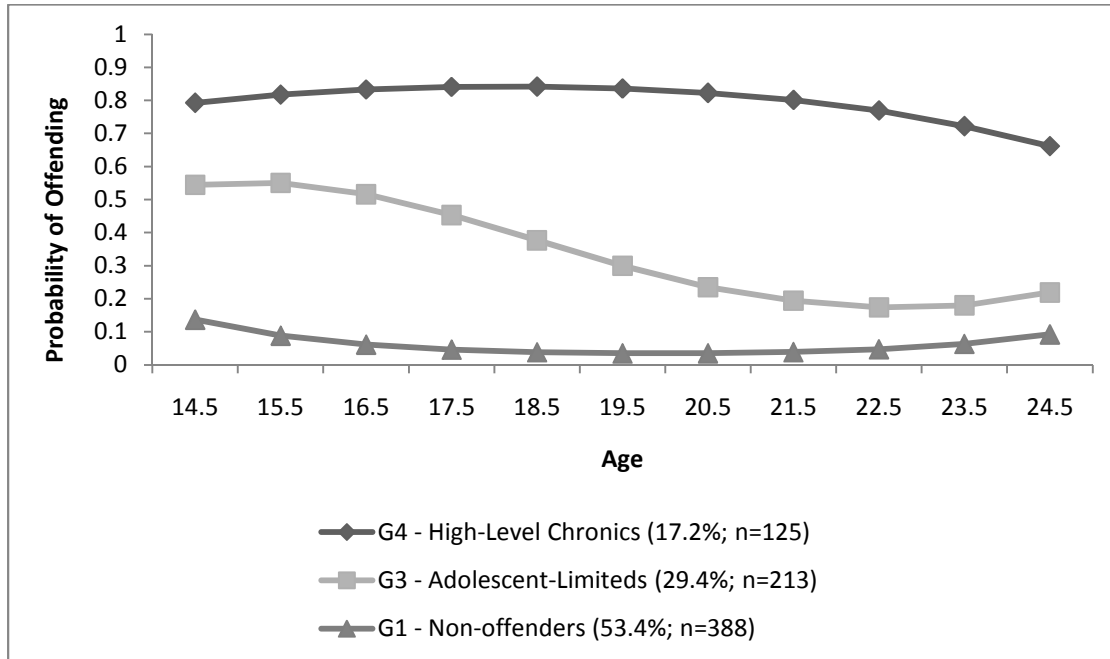


Figure 4. Trajectories of Self-Reported Offending – Hispanic Sample (n=726).

similar to that observed for blacks (.20). The next group (G4 in Figure 4) represents 17.2% of the Hispanic sample. This group has an initial probability of involvement in offending of .79. The probability of offending for this group peaks around age 18 (.84) and declines slightly with the onset of young adulthood; the wave 12 probability for this group is .66. Due to the high probability of involvement in offending across all waves of the observation period, this group is labeled as high-level chronic.

The model fit indices for the Hispanic sample are provided in Table 10. Although the three-group model fit the data best based on the same model selection criteria used in the other trajectory analyses, the current study did explore the possibility of selecting a four-group model for the Hispanic sample as well. When a fourth group was added to the model, the new trajectory that emerged resembled the adolescent-escalator trajectory that was found in the other three samples, however, the mean posterior probability of group

assignment for this group was below the .7 cutoff and the shape of the trajectory was not consistent with what was observed in the other race-specific models. In order to stay consistent with the model selection processes utilized in the other three models, the three-group model was selected for the Hispanic sample.

Table 10

Model Fit Indices for Self-Reported Offending Trajectories – Hispanic Sample (n=726)

# of Groups	BIC (n = 4,831)	BIC ¹ (n = 726)	AvePP's
2	-2554.59	-2548.91	.95, .93
3	-2533.87	-2522.50	.89, .79, .87
4	-2517.77	-2503.55	.86, .68, .74, .86
5	-2513.40	-2496.34	.72, .86, .67, .68, .85

As noted in Chapter 5, model selection in the SPGM process is part science and statistics and part art. Several steps in the process of estimating and selecting SPGM models reflect discretionary decisions made by the researcher. This caveat is acknowledged here because it could be argued that a four-group model rather than a three-group model fit the data best for the Hispanic sample as was the case for the white and black samples. The current study utilized the .7 mean posterior probability value as a hard cutoff in selecting the three-group model for Hispanics; however, the mean posterior probability observed for the adolescent-escalator trajectory in the four-group Hispanic model (.68) is only marginally below that cut off and because a four-group model fit the data best in the aggregate, white, and black samples, it is reasonable to argue that there is substantive evidence that supports a four-group model for Hispanics as well. In selecting the three-group model, the current study is not suggesting that no individuals in the

Hispanic cohort could possibly follow an escalating trajectory; only that a three-group model fits the data more appropriately.

In addition to the statistical justification for selecting the three-group model, there is substantive evidence that supports the selection of the three-group model as well. Previous research by Reitzel (2006) also identified four trajectories of offending for whites and blacks but only three trajectories for Hispanics. Additional support is provided in the bottom portion of Table 12 which displays the prevalence of each racial and ethnic subgroup within the four trajectory groups from the aggregate model. Within the aggregate model, a smaller proportion of Hispanics (8%) are classified in the adolescent-escalator trajectory than either blacks (10%) or whites (12%). Additionally, while Hispanics made up 21% of the study sample, they made up only 15% of the offenders classified as escalators. This suggests that while some Hispanics do appear to follow an escalating offending trajectory, this pattern is less prevalent among Hispanics relative to whites or blacks. Regardless of any controversy over the correct number of groups in the Hispanic cohort, this model supports the study conclusion that there are more similarities than differences in trajectories of offending across race and ethnicity.

Frequency of offending across trajectory groups. Table 11 displays the mean frequency of offending across the full observation period for each trajectory group in the full and racially-disaggregated models. These results indicate that, across all four models, frequency of offending varied significantly across trajectory groups in the expected direction. Groups with a higher probability of involvement in offending also displayed the highest frequency of offending. This was especially true for the group labeled as high-level chronics in each model. In all four models, the high-level chronic group

Table 11*Mean Frequency of Offending by Trajectory Group by Race and Ethnicity*

Sample	Non- Offenders <i>G1</i>	Adolescent- Escalators <i>G2</i>	Adolescent- Limiteds <i>G3</i>	High-Level Chronics <i>G4</i>	<i>F</i>	Tukey's <i>b</i>
Full (n=3,416)	.35	4.55	6.82	24.49	146.43*	G4>G1-G3; G2,G3>G1
White (n=1,776)	.30	4.77	7.98	27.61	79.46*	G4>G1-G3; G2,G3>G1
Black (n=914)	.64	4.85	7.20	22.04	31.51*	G4>G1-G3; G3>G1
Hispanic (n=726)	.28	--	5.51	17.93	39.05*	G4>G1,G3; G3>G1

* $p < .001$

displayed a significantly higher mean frequency of offending across the study observation period. In all four models, the mean frequency of offending for the group labeled adolescent-limiteds was significantly higher than the mean frequency of offending for the non-offender group. In the three models where an adolescent-escalator group was identified, no significant differences in the mean frequency of offending were observed between the adolescent-limited and adolescent-escalator groups. This finding suggests that despite different initial probabilities of involvement in offending, these two groups offend at roughly the same rate over the observation period. Consequently, if group-based trajectory modeling was not employed, these two groups could have been viewed as a single group of offenders with the same mean rate of offending over time. The lowest frequency of offending was consistently observed for the group labeled non-offenders in all four models.

Comparing the trajectory group mean frequencies of offending across race and ethnicity, we see that whites in the chronic and adolescent-limited trajectories displayed greater frequencies of offending on average than did blacks or Hispanics who were similarly classified. In the adolescent-escalator and non-offender trajectories, the highest mean frequencies of offending were observed for blacks relative to whites and Hispanics. Overall, these results confirm what was observed above, that whites had the highest frequency and prevalence of offending within the current study sample. Additionally, the results of the frequency analyses disaggregated by trajectory group suggest that the results of the current study would not have varied greatly if frequency of offending was employed as an outcome measure instead of prevalence.

Mean Differences in Risk and Protective Factors across Trajectory Groups

The next step in the analyses examined how risk and protective factors were associated with the offending trajectory groups derived from the SPGM analysis. In order to examine group mean-level differences in risk and protective factors across trajectory groups a series of ANOVA's were estimated for the full sample and the trajectory models disaggregated by race and ethnicity. Additionally, Tukey's *b* post hoc analyses were run in order to isolate which groups differed significantly in mean levels of risk and protective factors. Tables 12-15 depict the results from these mean difference tests.

Full sample. In the full study sample, the results indicate that all of the risk factors, with the exception of parent-reported learning disability, significantly distinguish offending trajectories at the bivariate level. In general, the risk factors distinguished offending trajectories in the expected direction; higher levels of risk factors and lower levels of protective factors were generally found in the adolescent-limited (G3) and high-level chronic trajectories (G4). Gender and maternal attachment distinguished individuals in the three offending trajectories from non-offenders only while prior delinquency distinguished all four trajectories significantly. A majority of the remaining risk factors (impulsivity, early arrest, maternal monitoring, perceived peer delinquency, school environment, and neighborhood disorganization) only distinguished groups with a low initial probability of offending (G1, G2) from groups with an initially high probability of offending (G3, G4). The environmental risk index distinguished the adolescent-escalators (G2) from the adolescent-limiteds (G3) only. Cognitive functioning and household poverty significantly distinguished offending trajectories as well, but not in the expected ways. Contrary to Moffitt's prediction, the mean level of cognitive functioning was

significantly lower for the adolescent-limited group than any other group; the highest mean level of cognitive functioning was observed in the adolescent-escalator group. Moffitt's theory hypothesizes that adolescent-limited offending is a normative developmental pattern and that AL's do not suffer from the same cognitive disadvantages as more chronic offenders. This hypothesis was not supported in the current study where chronic offenders had higher levels of cognitive functioning than adolescent-limiteds. The mean rate of household poverty was significantly lower in the high-level chronic group than in either the non-offending or adolescent-limited groups. This finding is contrary to extant literature which finds that life-course persistent offending is more common in structurally disadvantaged neighborhoods (see e.g., Piquero et al., 2005).

The bottom portion of Table 12 displays the prevalence of whites, blacks and Hispanics in the four offending trajectories as well as the relative proportion of individuals from each subgroup in each offending trajectory. There were significant racial differences in group membership across the four trajectory groups ($\chi^2 = 30.84, p < .05$). These findings indicate the whites were about 6% less likely to be in the non-offender group than either minority group. Additionally, whites had the highest prevalence (16.3%) in the high-level chronic trajectory. Hispanics were less likely to be assigned to the group labeled adolescent-escalators (8.3%), than either whites (12.7%) or blacks (10.7%). Across race and ethnicity, the proportion of the sample classified in the adolescent-limited trajectory was nearly identical; 23.9% for whites, 24.9% for blacks, and 24.7% for Hispanics.

Contrary to Moffitt's (1994) hypothesis and the current study prediction, African-Americans were not disproportionately represented in either the adolescent-limited or

Table 12*Group Mean Differences in Risk and Protective Factors by Trajectory Group – Full Sample (n=3,416)*

Variable	Non-Offenders G1 (n=1,714)	Adolescent-Escalators G2 (n=384)	Adolescent-Limiteds G3 (n=831)	High-Level Chronics G4 (n=487)	F	Tukey's b
Gender	.43	.61	.57	.62	31.14*	G2-G4>G1
Prior Delinquency	.85	1.24	2.27	3.02	242.55*	G4>G1-G3; G3>G2,G1; G2>G1
Impulsivity	1.40	1.57	1.92	1.96	48.49*	G4,G3>G2,G1; G2>G1
Cognitive Functioning	44.94	52.41	39.91	47.80	14.81*	G3<G1,G2,G4; G1,G4<G2
Learning Disability	.10	.12	.14	.12	3.49*	None
Early Arrest	.03	.05	.10	.12	22.87*	G4,G3>G2,G1
Maternal Attachment	25.60	24.93	24.30	23.74	24.92*	G4<G2,G1; G3,G2<G1
Maternal Monitoring	10.66	10.36	9.52	9.30	35.06*	G4,G3<G2,G1
Perceived Peer Delinq.	1.17	1.20	1.61	1.85	34.29*	G4>G1-G3; G3>G2,G1
School Environment	4.32	4.35	3.91	3.99	31.90*	G4,G3<G2,G1
Environmental Risk	1.34	1.18	1.50	1.30	4.53*	G3>G2
Neighborhood Disorg.	.39	.43	.50	.54	16.56*	G4,G3>G2,G1
Household Poverty	.25	.22	.27	.16	5.91*	G3,G1>G4
White (52%)	47.1 %	12.7 %	23.9 %	16.3 %		--
% within group	48.8 %	58.9 %	51.1 %	59.5 %		
Black (27%)	53.7 %	10.7 %	24.9 %	10.6 %	$\chi^2 = 30.84^*$	--
% within group	28.6 %	25.5 %	27.4 %	20.0 %		
Hispanic (21%)	53.3 %	8.3 %	24.7 %	13.8 %		--
% within group	22.6 %	15.6 %	21.5 %	20.5 %		

* $p < .05$

high-level chronic trajectories. These findings are consistent with what was observed in the race-specific trajectories described above.

White sample. The mean differences in risk and protective factors across offending trajectories for the white sample are presented in Table 13. A number of interesting findings emerged regarding the ability of risk and protective factors to distinguish offending trajectories for whites. As was the case in the full model, all of the risk and protective factors other than the learning disability measure were shown to significantly distinguish offending trajectories on some level. Gender differed significantly between offenders and non-offenders; with male gender predicting involvement in one of the three offending trajectories but not distinguishing between the offending patterns. Prior delinquency was shown to distinguish between all four trajectories in the expected direction. As was the case in the aggregate model, the majority of the risk factors distinguished trajectories with an initially low probability of offending (G1, G2) from those with an initially high probability of offending (G3, G4) only. Mean levels of structural risk factors were greatest for the group labeled adolescent-limiteds, not the chronic offending group as would be expected. Once again, cognitive functioning and household poverty did distinguish offending trajectories, but not in the expected ways. Cognitive functioning was highest in the group following the escalating trajectory and lowest in the adolescent-limited group. The high-level chronic group had an identical mean level of cognitive functioning as the non-offender group. Poverty distinguished adolescent-limiteds from the other groups, but was once again lowest in the high-level chronic offending group where theoretically it should be the highest.

Black sample. The findings from the mean difference tests across offending trajectories in the black sample are presented in Table 14. Several interesting differences were observed when comparing the results for the black sample to the white and aggregate models. Consistent with what was found in the white and aggregate models, gender and prior delinquency significantly distinguished between trajectories. Gender distinguished offenders from non-offenders but did not vary significantly between trajectories with different patterns of offending. Prior delinquency distinguished the high-level chronic group from the three other groups and distinguished adolescent-escalators and adolescent-limiteds from non-offenders but did not significantly distinguish between the escalators and limiteds. Additionally, impulsivity and neighborhood disorganization distinguished the chronic group from the non-offender group only. The perceived peer delinquency risk factor significantly distinguished the chronic and escalating trajectories from the non-offender trajectory suggesting that peers may play a key role in continued offending involvement for blacks.

Several of the risk factors that distinguished offending trajectories in the white and aggregate models did not significantly distinguish offending trajectories in the black sample. No significant mean differences were observed for cognitive functioning, maternal attachment, maternal monitoring, the environmental risk index, or household poverty. Additionally, while the *F* values for learning disability, early arrest, and school environment suggest that there are significant mean differences in these factors across groups, post hoc analyses failed to find significant differences between any of the groups. Interestingly, many of these risk factors did distinguish offending trajectories significantly for whites. Other than gender and prior delinquency, most of the risk factors

Table 13*Group Mean Differences in Risk and Protective Factors by Trajectory Group – White Sample (n=1,776)*

Variable	Non-Offenders G1 (n=820)	Adolescent-Escalators G2 (n=242)	Adolescent-Limiteds G3 (n=440)	High-Level Chronics G4 (n=274)	F	Tukey's b
Gender	.47	.57	.58	.59	7.76*	G2-G4>G1
Prior Delinquency	.78	1.21	2.51	3.04	149.55*	G4>G1-G3; G3>G2,G1; G2>G1
Impulsivity	1.25	1.46	1.94	1.95	41.82*	G4,G3>G2,G1
Cognitive Functioning	57.70	63.47	48.22	57.69	15.96*	G3<G1,G2,G4; G1,G4<G2
Learning Disability	.11	.10	.16	.13	2.21	None
Early Arrest	.03	.03	.08	.10	11.02*	G4,G3>G2,G1
Maternal Attachment	26.14	25.23	24.42	23.73	24.47*	G4,G3<G2,G1; G2<G1
Maternal Monitoring	11.15	10.71	9.66	9.65	30.22*	G4,G3<G2,G1
Perceived Peer Delinq.	.92	.97	1.52	1.73	30.91*	G4,G3>G2,G1
School Environment	4.49	4.52	4.07	4.07	23.47*	G4,G3<G2,G1
Environmental Risk	.87	.81	1.16	1.01	6.49*	G3>G1,G2
Neighborhood Disorg.	.30	.37	.40	.47	11.13*	G4>G2,G1; G3>G1
Household Poverty	.09	.10	.18	.06	8.25*	G3>G1,G2,G4

* $p < .05$

Table 14*Group Mean Differences in Risk and Protective Factors by Trajectory Group – Black Sample (n=914)*

Variable	Non-Offenders G1 (n=534)	Adolescent-Escalators G2 (n=91)	Adolescent-Limiteds G3 (n=217)	High-Level Chronics G4 (n=72)	F	Tukey's b
Gender	.40	.70	.62	.64	18.61*	G2-G4>G1
Prior Delinquency	.98	1.73	2.08	3.03	44.49*	G4>G1-G3; G2,G3>G1
Impulsivity	1.48	1.85	1.70	1.92	5.11*	G4>G1
Cognitive Functioning	29.55	32.89	26.60	31.88	1.42	None
Learning Disability	.09	.15	.17	.08	3.58*	None
Early Arrest	.05	.12	.13	.13	6.17*	None
Maternal Attachment	24.83	24.22	24.42	23.30	2.04	None
Maternal Monitoring	10.03	9.49	9.44	9.44	1.96	None
Perceived Peer Delinq.	1.52	2.07	1.74	2.28	7.09*	G4>G3,G1; G2>G1
School Environment	3.98	3.83	3.62	3.64	4.89*	None
Environmental Risk	1.98	1.89	2.20	1.84	1.27	None
Neighborhood Disorg.	.45	.54	.56	.63	4.77*	G4>G1
Household Poverty	.42	.38	.40	.38	.16	None

* $p < .05$

included in the analyses did not distinguish between offending trajectories for blacks. The few additional risk factors that did distinguish between offending trajectories were best able to distinguish chronic offenders from non-offenders only.

Hispanic sample. The results of the mean difference tests assessing the ability of risk and protective factors to distinguish between offending trajectories for the Hispanic sample are presented in Table 15. Overall, 9 of the 13 risk factors differed significantly across groups in the Hispanic sample. As expected, prior delinquency significantly distinguished between all three offending trajectories. The majority of the other significant risk factors (gender, impulsivity, early arrest, maternal attachment, maternal monitoring, and neighborhood disorganization) distinguished the two offending trajectories (G3, G4) from the non-offending trajectory only. Additionally, perceived peer delinquency distinguished the chronic group from the non-offender group only and school environment distinguished the adolescent-limited trajectory from the non-offender trajectory only.

In sum. Across the four models, risk and protective factors were generally able to distinguish offenders from non-offenders. While some risk factors (e.g., prior delinquency) were shown to distinguish between offending trajectories with different developmental patterns, most of the risk and protective factors were not able to distinguish between the two groups with initially high probabilities of involvement in offending; the adolescent-limited group (G3 in all models) and the high-level chronic group (G4 in all models). In general, these two groups showed the highest level of risk compared to the groups with a lower initial probability of involvement in offending. The group labeled as non-offenders evinced the lowest level of risk and highest level of

Table 15*Group Mean Differences in Risk and Protective Factors by Trajectory Group – Hispanics (n=726)*

Variable	Non-Offenders G1 (n=388)	Adolescent-Limiteds G3 (n=213)	High-Level Chronics G4 (n=125)	F	Tukey's b
Gender	.42	.57	.63	11.60*	G4,G3>G1
Prior Delinquency	.85	1.92	2.71	58.67*	G4>G3,G1; G3>G1
Impulsivity	1.56	2.15	1.95	17.43*	G3,G4>G1
Cognitive Functioning	34.07	33.39	39.12	1.88	None
Learning Disability	.06	.09	.10	1.12	None
Early Arrest	.03	.11	.13	9.50*	G4,G3>G1
Maternal Attachment	25.37	24.27	23.82	6.70*	G4,G3<G1
Maternal Monitoring	10.40	9.37	8.67	15.64*	G4,G3<G1
Perceived Peer Delinq.	1.26	1.55	1.67	3.91*	G4>G1
School Environment	4.33	4.08	4.17	4.14*	G3<G1
Environmental Risk	1.53	1.71	1.51	1.04	None
Neighborhood Disorg.	.52	.68	.63	7.77*	G3,G4>G1
Household Poverty	.41	.40	.35	.57	None

* $p < .05$

protective factors in nearly every instance across the four models. There was also evidence of consistency in the factors that distinguished the adolescent-escalators (G2) from the non-offenders (G1). Gender and prior delinquency distinguished these two trajectories in the aggregate, white, and black samples. In addition to gender and prior delinquency, maternal attachment in the aggregate and white samples and perceived peer delinquency in the black sample also distinguished escalators from non-offenders.

Some interesting differences across the racially disaggregated models did appear as well. One particular finding that emerged was that several of the risk and protective factors that distinguished offending trajectories in the aggregate, white, and Hispanic models did not significantly distinguish offending trajectories in the black sample. These findings are discussed in more detail below, in the context of the multivariate results.

Multivariate Analysis

The final stage of the study analysis explored how risk and protective factors simultaneously distinguished trajectories of offending in the full sample and disaggregated across race and ethnicity. These analyses proceeded in two stages. In the first set of models, the trajectory groups were regressed onto the risk and protective factors from each risk domain (demographics, individual-level risk, parenting/family, peers, and structural-level risk) separately. Results from these multinomial logistic regression models are displayed in Tables 16-19². After examining the ability of the factors from each risk domain to distinguish offending trajectories, a full model is examined in which the offending groups are regressed onto all of the risk factors

² Each block in Tables 16-19 reflects the results of a separate multinomial logistic regression model in which trajectory group membership is regressed onto the risk factors listed in that block. This demonstrates the effects of risk and protective factors from each domain before controlling for the factors from other domains.

simultaneously. The full model results are displayed in Tables 20-23. Full model results are presented both adjusted and unadjusted for prior involvement in delinquency. In all of the models, the non-offender group (G1) is selected as the reference group to which all other groups are contrasted. All results are presented for the full sample and separately for each racial and ethnic subgroup. An additional set of full multivariate models with the adolescent-limited trajectory as the reference group were conducted to better identify the factors that distinguished between the adolescent-limited and high-level chronic trajectories. Results from these additional models are presented in Appendix A.

Multinomial logistic regression results disaggregated by risk domain.

Full sample. Table 16 reports the results of the multinomial logistic regression of trajectory groups onto risk factors from the five risk domains for the full study sample. The results for the full sample indicate that, with the exception of learning disability and environmental risk index, all of the risk factors distinguished between offending trajectories on some level. The first block of Table 16 presents the results from the regression of trajectory groups onto the demographic factors of race/ethnicity and gender. Minority status was significantly and negatively related to membership in both the adolescent-escalator and high-level chronic trajectories compared to the non-offender trajectory. This indicates that, compared to whites, both blacks and Hispanics were less likely to be classified as either adolescent-escalators or high-level chronic offenders as opposed to non-offenders. Male gender was positively related to membership in all three offending trajectories relative to the non-offender trajectory.

Of the individual-level risk factors, impulsivity, cognitive functioning, and early involvement in the criminal justice system emerged as significant discriminators between

Table 16*Multinomial Regression Results by Risk Domain – Full Sample (n=3,416)*

Variables (reference)	Adolescent-Escalators¹ G2 <i>Odds</i>	Adolescent-Limiteds¹ G3 <i>Odds</i>	High-Level Chronics¹ G4 <i>Odds</i>	Model Statistics $\chi^2 (R^2)^{\dagger}$
<i>Demographics</i>				121.82*** (.04)
Race				
Black (white)	.75*	.92	.58***	
Hispanic (white)	.58**	.92	.75*	
Gender (female)	2.04***	1.75***	2.09***	
<i>Individual-level risk</i>				182.26*** (.07)
Impulsivity	1.15*	1.43***	1.48***	
Cognitive functioning	1.01***	1.00	1.01**	
Learning disability (no)	1.27	1.13	1.08	
Early arrest (no)	1.60	2.43***	3.35***	
<i>Parenting/Family</i>				121.51*** (.04)
Maternal attachment	.97*	.97*	.95***	
Maternal monitoring	.99	.92***	.91***	
<i>Peers</i>				98.27*** (.03)
Perceived peer delinquency	1.02	1.21***	1.32***	
<i>Structural-level risk</i>				110.93*** (.04)
School environment	1.08	.77***	.78***	
Environmental risk index	.94	1.03	1.01	
Neighborhood disorg. (no)	1.23	1.41**	1.58***	
Household poverty (no)	.92	.97	.49***	

*= $p < .05$, **= $p < .01$, ***= $p < .001$; $\dagger R^2$ reflects Cox and Snell Pseudo R-Square.¹G1 (non-offenders) is reference group

offending trajectories. Impulsivity increased the odds of being in all three offending trajectories relative to the non-offender group. Cognitive functioning was significantly related to membership in groups two and four relative to group one. Although cognitive functioning did emerge as a significant discriminator between groups, it had little effect on the odds of being in either offending group relative to the non-offending group. Being arrested before the age of 13.5 had a strong positive effect on membership in groups three and four relative to group one. The presence of an early arrest increased the odds of being

in the adolescent-limited group by 143% relative to group one and by 235% for the high-level chronic group relative to group one.

Both parenting measures distinguished offending trajectories from the non-offender group. Youths with lower levels of maternal attachment were more likely to be in one of the three offending trajectories relative to the non-offending group.

Additionally, youths with lower levels of maternal monitoring were more likely to be in either the adolescent-limited or high-level chronic trajectory relative to the non-offender trajectory. Perceived peer delinquency also emerged as a significant discriminator between the two groups with the highest initial probability of involvement in offending (G3 and G4) and the non-offending trajectory.

Three of the four structural-level variables also emerged as significant discriminators between trajectories. Quality of school environment was negatively related to membership in the adolescent-limited and high-level chronic trajectories relative to the non-offender trajectory while neighborhood disorganization was positively related to membership in both of these groups relative to the non-offending group. Unexpectedly, household poverty was negatively related to membership in group four, indicating that individuals in the high-level chronic trajectory were less likely to live in poverty than individuals in the non-offender group.

White sample. The results of the multinomial logistic regressions by risk domain for the white sample are presented in Table 17. The results from the white sample are very consistent with the findings from the full sample. Gender, impulsivity, cognitive functioning, maternal attachment, and neighborhood disorganization all emerged as significant discriminators between the three offending groups and the non-offenders.

Additionally, early contact with the criminal justice system, maternal monitoring, perceived peer delinquency, and quality of school environment all significantly distinguished the adolescent-limited and high-level chronic trajectory groups from the non-offending group. Poverty was again a significant discriminator between groups. Poverty was positively related to membership in the adolescent-limited offending trajectory relative to the non-offender trajectory but negatively related to membership in the high-level chronic trajectory relative to the non-offender trajectory.

Table 17

Multinomial Regression Results by Risk Domain – White Sample (n=1,776)

Variables (reference)	Adolescent- Escalators ¹	Adolescent- Limiteds ¹	High-Level Chronics ¹	Model Statistics
	G2 Odds	G3 Odds	G4 Odds	$\chi^2 (R^2)$ [♦]
<i>Demographics</i>				23.06*** (.01)
Gender (female)	1.52**	1.58***	1.63**	
<i>Individual-level risk</i>				154.60*** (.11)
Impulsivity	1.24**	1.58***	1.60***	
Cognitive functioning	1.01*	.99**	1.00	
Learning disability (no)	.81	.82	.82	
Early arrest (no)	1.40	3.24**	4.41***	
<i>Parenting/Family</i>				108.31*** (.06)
Maternal attachment	.96*	.96*	.93***	
Maternal monitoring	.98	.88***	.90***	
<i>Peers</i>				87.37*** (.05)
Perceived peer delinquency	1.03	1.33***	1.44***	
<i>Structural-level risk</i>				93.18*** (.07)
School environment	1.10	.74***	.74***	
Environmental risk index	.98	1.07	1.07	
Neighborhood disorg. (no)	1.37†	1.45*	1.80***	
Household poverty (no)	1.20	1.75**	.48*	

†=p<.10, *=p<.05, **=p<.01, ***=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

Black sample. The results from the domain-specific multinomial logistic regressions for the black sample are presented in Table 18. For African-Americans, gender emerged as a strong predictor of membership in offending trajectories. The largest

effect of gender was observed for the adolescent-escalator group where being male increased the odds of group membership by 2.52 relative to the non-offending group.

Table 18

Multinomial Regression Results by Risk Domain – Black Sample (n=914)

Variables (reference)	Adolescent- Escalators ¹	Adolescent- Limiteds ¹	High-Level Chronics ¹	Model Statistics
	G2 Odds	G3 Odds	G4 Odds	$\chi^2 (R^2)$ [♦]
<i>Demographics</i>				53.58*** (.05)
Gender (female)	3.52***	2.40***	2.63***	
<i>Individual-level risk</i>				33.80** (.05)
Impulsivity	1.26*	1.11	1.45**	
Cognitive functioning	1.01*	.99	1.00	
Learning disability (no)	2.33*	1.79†	.48	
Early arrest (no)	2.36†	1.97†	2.66†	
<i>Parenting/Family</i>				9.61 (.01)
Maternal attachment	.99	1.00	.95†	
Maternal monitoring	.96	.95†	.98	
<i>Peers</i>				20.40*** (.02)
Perceived peer delinquency	1.24**	1.10†	1.34***	
<i>Structural-level risk</i>				19.79† (.03)
School environment	.91	.80**	.77*	
Environmental risk index	1.00	1.08	1.01	
Neighborhood disorg. (no)	1.57	1.48†	1.21	
Household poverty (no)	.89	.88	.85	

†=p<.10, *=p<.05, **=p<.01, ***=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

Significant discriminating factors from the individual-level risk domain included impulsivity, which distinguished adolescent-escalators and high-level chronics from non-offenders and learning disability, which distinguished adolescent-escalators and adolescent-limiteds from non-offenders. Maternal attachment discriminated between high-level chronics and non-offenders only while maternal monitoring discriminated between adolescent-limiteds and non-offenders only. Additionally, the perceived peer delinquency risk factor significantly distinguished all three offending groups from the

non-offenders. Finally, among the structural-level factors, only school environment and neighborhood disorganization emerged as significant discriminators of group membership. Quality of school environment (a protective measure) was negatively related to membership in groups three and four relative to group one while neighborhood disorganization distinguished adolescent-limiteds from non-offenders only.

Hispanic Sample. The multinomial logistic regression results by risk domain for the Hispanic sample are presented in Table 19. The results indicate that six of the twelve risk factors significantly discriminated between offending trajectories within the Hispanic

Table 19

Multinomial Regression Results by Risk Domain – Hispanic Sample (n=726)

Variables (reference)	Adolescent-Limiteds¹ <i>G3</i> <i>Odds</i>	High-Level Chronics¹ <i>G4</i> <i>Odds</i>	Model Statistics $\chi^2 (R^2)$ [♦]
<i>Demographics</i>			22.73*** (.03)
Gender (female)	1.82**	2.37**	
<i>Individual-level risk</i>			40.53*** (.08)
Impulsivity	1.58***	1.33*	
Cognitive functioning	1.01	1.01**	
Learning disability (no)	1.59	1.93	
Early arrest (no)	1.93	2.72*	
<i>Parenting/Family</i>			31.88*** (.05)
Maternal attachment	.98	.98	
Maternal monitoring	.92**	.86***	
<i>Peers</i>			7.74† (.01)
Perceived peer delinquency	1.12*	1.17*	
<i>Structural-level risk</i>			12.01 (.02)
School environment	.92	.91	
Environmental risk index	1.08	1.00	
Neighborhood disorg. (no)	1.79**	1.52†	
Household poverty (no)	.83	.72	

†=p<.10, *=p<.05, **=p<.01, ***=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

sample. Gender, impulsivity, maternal monitoring, perceived peer delinquency, and neighborhood disorganization all emerged as significant discriminators between the two offending trajectories identified within the Hispanic sample and the non-offender trajectory. Additionally, early involvement with the criminal justice system discriminated between the high-level chronic trajectory and the non-offender trajectory.

In sum. In general, the findings from the domain-specific multinomial logistic regression models suggest that when risk factors from different domains are examined in isolation, factors from all domains do significantly discriminate between offending trajectories in general and across race and ethnicity. These findings are limited however, because they do not account for the influence of all the risk and protective factors simultaneously. While these findings provide valuable information regarding the ability of risk factors to distinguish offending trajectories, a better understanding of the issue can be achieved by exploring the ability of risk factors to simultaneously distinguish offending trajectories.

That caveat aside, some interesting findings regarding racial and ethnic differences in the ability of risk factors to distinguish offending trajectories did emerge from the domain-specific models. Comparing across the three models disaggregated by race and ethnicity, the results indicate that structural factors distinguish offending trajectories more consistently for whites than they do for minorities. Another interesting finding is that early contact with the criminal justice system and perceived peer delinquency appear to differentially discriminate between offending trajectories for blacks relative to whites. While these two factors do not distinguish the adolescent-escalator trajectory from the non-offending trajectory for whites, they emerge as strong

predictors of involvement in the adolescent-escalator trajectory relative to the non-offending trajectory for blacks. Additionally, gender appears to distinguish between offending trajectories more strongly for minorities than it does for whites.

Full model multinomial logistic regression results. In order to better elucidate the ability of risk and protective factors to distinguish between offending trajectories and explore if and how this process varies by race and ethnicity, the final stage of the study analysis examined full models in which the trajectory groups were regressed onto the complete set of risk and protective factors simultaneously. These models were estimated without prior delinquent involvement included and adjusted for prior delinquency.

Full sample. The results of the full model multinomial logistic regression analyses for the full study sample are presented in Table 20. Overall, these results suggest that several of the included risk and protective factors significantly distinguish offending trajectories. The results also suggest that a considerable amount of the influence of the risk and protective factors on offending group membership operates indirectly through prior delinquency. A number of risk and protective factors were significantly related to trajectory group membership before adjustment for baseline delinquent involvement. Gender, impulsivity, cognitive functioning, and neighborhood disorganization all significantly discriminated between the adolescent-escalator trajectory (G2) and the non-offender trajectory (G1). This indicates that males, individuals who were more impulsive, individuals who performed better on the cognitive functioning measure, and individuals who reported growing up in neighborhoods where gangs were present were more likely to follow the adolescent-escalating trajectory relative to the non-offending trajectory. In the adjusted models, gender, cognitive functioning, and neighborhood disorganization

Table 20*Full Multinomial Regression Results – Full Sample (n=3,416)*

Variables (reference)	Adolescent-Escalators ¹		Adolescent-Limiteds ¹		High-Level Chronics ¹	
	G2		G3		G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
Race						
Black (white)	.98	1.02	.67**	.76	.64**	.75
Hispanic (white)	.73	.76	.74*	.82	.95	1.07
Gender (female)	2.24****	2.13****	1.69****	1.39****	2.07****	1.57****
Prior Delinquency	--	1.21***	--	1.66****	--	1.91****
Impulsivity	1.14*	1.09	1.25****	1.08	1.23***	.99
Cognitive functioning	1.01****	1.01***	1.00	1.00	1.01**	1.01
Learning disability (no)	.82	.82	.93	.89	.79	.74
Early arrest (no)	1.23	.86	1.61*	.59*	2.18***	.62
Maternal attachment	.98	.98	.99	.99	.94***	.95***
Maternal monitoring	.98	.99	.94***	.97	.97	1.01
Perceived peer delinquency	1.05	1.03	1.11**	1.02	1.25****	1.10*
School environment	1.10	1.12	.86***	.89*	.90	.94
Environmental risk index	.93	.93	1.00	1.00	.95	.95
Neighborhood disorg. (no)	1.50**	1.41**	1.35**	1.13	1.31*	1.05
Household poverty (no)	1.25	1.23	1.06	1.03	.69*	.69*
Model fit	Unadjusted: $\chi^2=301.56****$ ($R^2=.14$) [♦]			Adjusted: $\chi^2=530.04****$ ($R^2=.24$) [♦]		

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
*p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R^2 reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

continued to discriminate the adolescent-escalator trajectory from the non-offending trajectory. As expected, prior delinquent involvement (measured as the variety of delinquent acts committed before the first NLSY interview) also significantly distinguished between the non-offenders and the adolescent-escalators. Race and ethnicity did not distinguish adolescent-escalators from non-offenders.

As was suggested in the bivariate and domain-specific regression analyses, many of the same risk and protective factors distinguished both of the trajectories with a high initial probability of involvement in offending (G3, G4) from the non-offender trajectory (G1). Before adjusting for prior delinquency, race and ethnicity significantly discriminated trajectory group membership for these two groups. Minority status in general was negatively related to membership in the adolescent-limited trajectory relative to the non-offending trajectory. Additionally, relative to whites, blacks were less likely to be classified as high-level chronic offenders as opposed to non-offenders. However, these effects were not significant in the fully adjusted model. This suggests that while minority status serves as a protective factor against membership in more serious offending trajectories, once prior delinquent involvement is controlled for, race is no longer able to discriminate offending trajectories.

Of the remaining thirteen risk and protective factors, nine were found to significantly discriminate offending trajectories before models were adjusted for prior delinquency. Gender, impulsivity, early arrest, maternal attachment, maternal monitoring, perceived peer delinquency, quality of school environment, neighborhood disorganization, and poverty all distinguished at least one of the two trajectories with an initially high probability of offending from the non-offenders. Gender, impulsivity, early

arrest, perceived peer delinquency, and neighborhood disorganization were all significantly and positively related to membership in groups three and four relative to group one. These factors demonstrated utility in distinguishing the adolescent-limited trajectory and the high-level chronic trajectory from the non-offending trajectory, but did not vary greatly between the two offending trajectories. In addition to the risk factors that operated generally across adolescent-limited and high-level chronic trajectories, maternal monitoring and quality of school environment discriminated the adolescent-limited trajectory from the non-offending trajectory while maternal attachment and poverty distinguished the high-level chronic trajectory from the non-offender trajectory. Unexpectedly, but consistent with what was found in the bivariate and domain-specific models, poverty was negatively related to membership in the high-level chronic trajectory. After adjusting for baseline delinquency, many of the risk and protective factors no longer significantly distinguished between the trajectories. In the adjusted model, only gender and delinquency are significant predictors of group membership across all groups. For the adolescent-limited group, early arrest remains significant in the adjusted model, but becomes negative and quality of school environment continues to be negatively related to group membership relative to the non-offending group. For the high-level chronic trajectory, maternal attachment, perceived peer delinquency, and poverty continue to distinguish chronic offenders from non-offenders.

White sample. The results of the full model multinomial logistic regressions for the white sample are presented in Table 21. These findings indicate that eight of the thirteen risk and protective factors significantly distinguished offending trajectories for whites. Gender, cognitive functioning, maternal attachment, and neighborhood

Table 21*Full Multinomial Regression Results – White Sample (n=1,776)*

Variables (reference)	Adolescent-Escalators ¹		Adolescent-Limiteds ¹		High-Level Chronics ¹	
	G2		G3		G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
Gender (female)	1.55**	1.47*	1.36*	1.09	1.51**	1.12
Prior Delinquency	--	1.25***	--	1.79****	--	2.02****
Impulsivity	1.13	1.07	1.31****	1.08	1.30***	1.03
Cognitive functioning	1.01**	1.01**	.99**	.99*	1.01	1.01*
Learning disability (no)	.57	.60	.74	.74	.70	.67
Early arrest (no)	.37	.26	1.68	.59	1.89	.54
Maternal attachment	.96*	.96*	.98	.98	.93***	.93***
Maternal monitoring	.94	.96	.90****	.93**	.96	1.01
Perceived peer delinquency	1.08	1.04	1.16**	1.03	1.26***	.97
School environment	1.09	1.10	.94	1.00	.91	.94
Environmental risk index	.90	.89	.96	.94	.98	.94
Neighborhood disorg. (no)	1.60**	1.51**	1.22	1.06	1.53**	1.31
Household poverty (no)	1.56	1.60	1.67**	1.78**	.69	.77
Model fit	Unadjusted: $\chi^2=220.66****$ ($R^2=.18$) [♦]			Adjusted: $\chi^2=365.52****$ ($R^2=.28$) [♦]		

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
 *p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

disorganization significantly discriminated the adolescent-escalator trajectory from the non-offender trajectory both before and after the model was adjusted for prior delinquent involvement. This suggests that males, individuals with higher cognitive functioning, individuals with lower levels of maternal attachment, and individuals who reside in socially disorganized neighborhoods are more likely to be classified in the adolescent-escalating trajectory relative to the non-offending trajectory. Several risk factors were also able to distinguish the adolescent-limited trajectory from the non-offender trajectory. In the unadjusted model, gender, impulsivity, maternal monitoring, perceived peer delinquency, and poverty all significantly discriminated between adolescent-limited offenders and non-offenders. Once the model was adjusted for baseline delinquent involvement, the significant effects of gender, impulsivity, and peer delinquency washed out. In the fully adjusted model, only prior delinquency, maternal monitoring, and poverty emerged as significant discriminating factors between the adolescent-limited and non-offender groups for whites. The effects of these risk factors were all in the expected direction indicating that a greater variety of delinquency involvement, lower levels of maternal monitoring, and higher levels of household poverty distinguished adolescent-limited offenders from non-offenders in the white sample.

Finally, for the high-level chronic group, gender, impulsivity, maternal attachment, perceived peer delinquency, and neighborhood disorganization emerged as significant discriminators in the unadjusted model. After adjusting the model for baseline delinquency, only prior delinquency and maternal attachment remained significant discriminators between the high-level chronic and the non-offender trajectory.

Black sample. The results of the full model multinomial logistic regressions for the black sample are presented in Table 22. Consistent with what was observed in the ANOVA and domain-specific regression models, far fewer risk and protective factors emerged as significant discriminators between offending trajectories for blacks relative to whites. Overall, seven of the thirteen risk factors distinguished between trajectories on some level, but there was very little consistency in the factors that emerged significantly across the three offending trajectories. Gender emerged as the strongest predictor of group membership across all trajectories. Relative to black females, black males were considerably more likely to be classified into one of the three offending trajectories relative to the non-offending trajectory. Impulsivity, cognitive functioning, and early arrest emerged as additional factors discriminating between the adolescent-escalator and non-offender trajectories. The significant effect of early contact with the criminal justice system is noteworthy for this group because it did not emerge as a significant predictor for either of the other two offending groups. After adjusting for prior delinquency, only gender and cognitive functioning significantly distinguish adolescent-escalators from non-offenders in the black sample.

Even fewer risk factors emerged as discriminating variables between the adolescent-limited and high-level chronic trajectories and the non-offending trajectory. For adolescent-limiteds, in the unadjusted model, gender, school environment, and neighborhood disorganization emerged as significant factors distinguishing the adolescent-limiteds from the non-offenders. After adjusting the model for baseline delinquency, only gender, prior delinquency and quality of school environment remained significant. For the high-level chronics, only gender and perceived peer delinquency

Table 22*Full Multinomial Regression Results – Black Sample (n=914)*

Variables (reference)	Adolescent-Escalators ¹		Adolescent-Limiteds ¹		High-Level Chronics ¹	
	G2		G3		G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
Gender (female)	5.32****	5.00****	2.74****	2.37***	3.82****	2.93***
Prior Delinquency	--	1.22	--	1.54****	--	1.98****
Impulsivity	1.29*	1.22	1.08	.99	1.22	1.03
Cognitive functioning	1.02**	1.02*	1.01	1.01	1.01	1.00
Learning disability (no)	2.09	1.96	1.30	1.08	.51	.44
Early arrest (no)	2.93*	1.90	2.15	.88	1.70	.43
Maternal attachment	1.01	1.02	1.01	1.03	.95	.99
Maternal monitoring	1.03	1.04	.99	1.02	1.03	1.07
Perceived peer delinquency	1.18	1.16	1.04	.99	1.33**	1.21
School environment	.94	.97	.76***	.80**	.80	.84
Environmental risk index	.99	.89	1.20	.94	.99	.94
Neighborhood disorg. (no)	1.55	1.41	1.78**	1.50	.97	.70
Household poverty (no)	.96	.93	.90	.87	.96	.90
Model fit	Unadjusted: $\chi^2=88.54****$ ($R^2=.18$) [♦]			Adjusted: $\chi^2=131.92****$ ($R^2=.25$) [♦]		

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
 *p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

emerged as significant discriminators in the unadjusted model. Once the model was adjusted for baseline delinquency, only gender and prior delinquency were shown to distinguish the high-level chronics from the non-offenders.

Hispanic sample. The results of the full model multinomial logistic regressions for the Hispanic sample are presented in Table 23. As was the case in the black sample, only a few risk and protective factors significantly distinguished the offending trajectories from the non-offending trajectory. In the unadjusted model for the Hispanic sample, gender, impulsivity, cognitive functioning, and neighborhood disorganization emerged as the only significant discriminators between the adolescent-limited and non-offender trajectories. After adjusting the model for baseline delinquency, the effect of neighborhood disorganization washed out leaving gender, prior delinquency, impulsivity, and cognitive functioning as the risk factors that significantly discriminated the adolescent-limited trajectory from the non-offender trajectory in the Hispanic sample. These findings suggest that males, individuals who engaged in a greater variety of delinquent acts, individuals with higher cognitive functioning, and individuals who were more impulsive were more likely to be in the adolescent-limited trajectory relative to the non-offender trajectory. In the unadjusted model, the high-level chronic trajectory was distinguished from the non-offender trajectory by gender, impulsivity, and cognitive functioning. After the model was adjusted for baseline delinquency, the effect of impulsivity was no longer significant leaving gender, prior delinquency, and cognitive functioning as the only significant discriminators between the chronic offenders and the non-offenders. While cognitive functioning emerged significant, its effect was very small

Table 23*Full Multinomial Regression Results – Hispanic Sample (n=726)*

Variables (reference)	Adolescent-Limiteds ¹		High-Level Chronics ¹	
	G3		G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
Gender (female)	2.22***	1.81**	2.54***	1.86*
Prior Delinquency	--	1.52****	--	1.77****
Impulsivity	1.56****	1.34**	1.31*	1.04
Cognitive functioning	1.01**	1.01*	1.02**	1.01**
Learning disability (no)	1.56	1.63	1.15	1.25
Early arrest (no)	1.46	.60	2.47	.72
Maternal attachment	.98	.99	.95	.96
Maternal monitoring	.99	1.03	.94	.98
Perceived peer delinquency	1.01	.94	1.11	.99
School environment	1.06	1.07	1.14	1.18
Environmental risk index	1.07	1.08	.88	.90
Neighborhood disorg. (no)	1.83**	1.58	1.20	.90
Household poverty (no)	.97	.88	1.04	.97
Model fit	Unadjusted: $\chi^2=60.68****$ ($R^2=.15$) [♦]		Adjusted: $\chi^2=97.78****$ ($R^2=.23$) [♦]	

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
 *p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G1 (non-offenders) is reference group

suggesting that gender and prior delinquency best distinguish between chronic offenders and non-offenders in the full Hispanic model.

In sum. The multinomial logistic regression results for the full study sample reveal some important findings. Specifically related to the third study research question regarding the generality of risk factors across trajectories, the results do not provide much support for trajectory-specific etiologies. Consistent with the third study hypothesis, and general theories of offending, the results suggest that a general set of risk factors distinguish offenders from non-offenders. Contrary to developmental theories, there was little evidence that unique causal mechanisms underlie trajectories with divergent developmental patterns. In general, these results appear to suggest that a general set of risk factors explain all patterns of offending; trajectories are distinguished by varying levels of risk rather than trajectory-specific factors. The theoretical significance of these findings is discussed further in Chapter 7. Table 24 displays the significant risk factors for the full sample and across the racially-disaggregated models.

Another interesting finding that emerged from the multinomial logistic regressions was that many of the risk factors that significantly distinguished offending trajectories in the unadjusted models were no longer significant after the model was adjusted for prior delinquency. This finding suggests that many of these risk factors are indirectly related to offending group membership through their influence on delinquency prior to the beginning of the current study observation period.

Across the full multinomial logistic regression models disaggregated by race and ethnicity several interesting findings also emerged. In regards to the fourth study hypothesis concerning the generality of risk factors across race and ethnicity, the findings

suggest that with the exception of gender and prior delinquency, most of the risk and protective factors included in the current study do not have general effects across race and ethnicity. Some factors such as neighborhood disorganization and cognitive functioning distinguish trajectories across all three samples, but overall most of the risk and protective factors do not appear to distinguish trajectories in the same way across race and ethnicity. Contrary to the fourth study hypothesis, fewer of the included risk and protective factors emerged as significant in the two minority samples relative to the white sample suggesting that the factors that distinguish offending trajectories among minorities may be different from those that distinguish offending trajectories among whites. Contrary to the fifth study hypothesis, there was no evidence that structural risk factors were more salient for minorities than whites. In general, structural risk factors did not fare very well in distinguishing offending trajectories within any of the racial or ethnic subgroups.

Overall, the findings described above suggest that heterogeneity in the development of offending is universal across race and ethnicity and that, within this sample, there are more similarities than differences in the number and shape of developmental trajectories that are identified across race and ethnicity. Additionally, the study findings provide support for general causal mechanisms rather than trajectory-specific etiologies. Although the factors that emerged as significant predictors of group membership were not fully consistent with the causal models offered by Gottfredson and Hirschi or Sampson and Laub, the study findings favor the parsimony of general theories over the complexity of developmental theories like Moffitt's dual taxonomy. The implications of the study findings are discussed in more detail in Chapter 7.

Table 24*Significant Risk Factors – Full Multivariate Models*

	Adolescent-Escalators¹	Adolescent-Limiteds¹	High-LevelChronics¹
Full Sample	Gender (+), Prior Delinquency (+), Cognitive Functioning (+), Neighborhood Disorganization (+)	Gender (+), Prior Delinquency (+), Early Arrest (-), School Environment (-)	Gender (+), Prior Delinquency (+), Maternal Attachment (-), Peer Delinquency (+), Poverty (-)
White Sample	Gender (+), Prior Delinquency (+), Cognitive Functioning (+), Maternal Attachment (-), Neighborhood Disorganization (+)	Prior Delinquency (+), Cognitive Functioning(-), Maternal Monitoring (-), Poverty (+)	Prior Delinquency (+), Cognitive Functioning(+), Maternal Attachment(-)
Black Sample	Gender (+), Cognitive Functioning (+)	Gender (+), Prior Delinquency(+), School Environment (-)	Gender (+), Prior Delinquency (+)
Hispanic Sample		Gender (+), Prior Delinquency (+), Impulsivity (+), Cognitive Functioning (+)	Gender (+), Prior Delinquency (+), Cognitive Functioning (+)

¹Non-Offenders is reference group

(+) denotes a positive coefficient; (-) denotes a negative coefficient

Chapter 7: Discussion

This study filled an important gap in the literature by examining racial and ethnic differences/similarities in offending trajectories in a cohort of adolescents who participated in the National Longitudinal Survey of Youth 1997. The study also explored how several risk and protective factors significantly distinguished offending trajectories both in general and across race and ethnicity. Finally, guided by the classification scheme of criminological theories set forth by Paternoster and colleagues (1997), the current study examined the utility of general versus developmental theories for explaining divergent trajectories of offending.

The current study builds upon a growing body of research informing race differences in trajectories of offending (Cohen et al., 2010; Reitzel, 2006) and the ability of risk and protective factors to distinguish offending trajectories both in general (Bersani et al., 2009; Chung et al., 2002; Fergusson et al., 2000; Laub & Sampson, 2003; Piquero et al., 2002; Piquero et al., 2007; Wiesner & Capaldi, 2003; Wiesner & Windle, 2004) and across subgroups (Jennings et al., 2010; Maldonado-Molina et al., 2009; 2010; Reitzel, 2006). This chapter provides a summary of the key study findings followed by a discussion of the theoretical implications of these findings. The chapter concludes with a discussion of the limitations of the current study and directions for future research.

Summary of Findings

As hypothesized, trajectory estimations revealed considerable similarities in both the number of groups and the patterns of offending observed across race and ethnicity. Heterogeneity in the development of offending was observed universally across the race and ethnic-specific trajectory models. A four-group model was found for whites and blacks while a three-group model was found for Hispanics. Three offending trajectories were common to all three racial and ethnic subgroups; a group that began with an initially low probability of involvement in offending and maintained a low probability of involvement in offending throughout the 11 years of observation (labeled non-offenders); a group that began with an initially high probability of involvement in offending that declined steadily over the observation period (labeled adolescent-limiteds); and a group that began with an initially high probability of involvement in offending and maintained the highest probability of involvement throughout the study period (labeled high-level chronics). Trajectory results revealed an additional group in the white and black samples. This group began with an initially low probability of involvement in offending that increased steadily through young adulthood before declining towards the end of the observation period; this group was labeled as adolescent-escalators. The finding of heterogeneity in the development of offending across race and ethnicity is consistent with previous empirical research (Cohen et al., 2010; Reitzel, 2006) and affirms that similar developmental patterns of offending are observable across race and ethnicity.

The patterns of offending that were identified in both the full and racially-disaggregated models are very consistent with what has been observed in previous applications of the trajectory methodology across a diverse array of samples (Piquero,

2008). Consistent with Moffitt's (1993) developmental taxonomy, study findings indicated that an adolescent-peaked and a chronic offending trajectory did emerge across all four models. Additionally, consistent with extant empirical findings (D'Unger, Land, McCall, & Nagin, 1998), a late-onset chronic trajectory (labeled adolescent-escalators) was identified in three of the four models. The fact that these patterns emerged across the racially-disaggregated models suggests that the patterns of offending that have been consistently observed in predominantly white and mixed race samples can in fact be replicated in minority samples. This finding supports the validity of taxonomic theories within minority samples (although dual taxonomy models do not account for all the patterns that emerged in the current study) and suggests that developmental patterns of offending may be more or less invariant across race and ethnicity.

In addition to examining race-specific models of offending trajectories, the current study also explored the relationship between race and trajectory group membership; specifically testing the hypothesis that African-Americans and Hispanics would be differentially involved in offending and therefore more likely to be classified in offending trajectories. Consistent with Moffitt (1994), the current study predicted that African-Americans would be found in greater prevalence in both chronic and adolescent-peaked offending trajectories. No support for this hypothesis was found; in fact, the opposite finding emerged. Study findings revealed that, within the 13-14 year old cohort of the NLSY97, blacks (10.6%) accounted for a smaller proportion of membership in the high-level chronic offending trajectory than either whites (16.3%) or Hispanics (13.8%). Similar proportions for all three racial groups were found in the adolescent-limited offending trajectory. Additionally, in the full sample trajectory model, minority status

emerged as a protective factor against membership in more serious offending trajectories relative to the non-offender trajectory.

The finding that whites offended in greater prevalence and at a higher average frequency than minorities is contrary to what was expected based on years of empirical research which suggests that minorities are overinvolved in certain types of offending. There are several possible reasons for this finding. Empirical research informing the relationship between race and crime has generally found that racial disproportionality in offending is most likely to be observed for serious and violent offenses (Elliott & Ageton, 1980; Elliott et al., 1986; Hawkins et al., 1998). As the current study examines mostly property and drug offending, it is possible that disproportionate minority involvement in offending is underestimated due to omitted variable bias. Another potential reason that warrants consideration is the possibility that the self-report measures of offending utilized in the current study are differentially valid across race and ethnicity. Some prior research has found that self-reports are differentially valid across race and ethnicity with minorities less likely to report some offending behaviors (Hindelang, Hirschi, & Weis, 1981); however, more recent empirical research has found that there are no differences in the predictive validity of self-reports across race (Farrington et al., 1996). The current study favors the latter argument but acknowledges that possibility that self-reports may be differentially valid across race and ethnicity. Another potential reason for the disparate finding that whites were more likely to be involved in offending is the fact that the current study utilizes a general population sample rather than an offender-based or at-risk sample. It is possible that race differences are more pronounced in studies that utilize

samples made up of higher risk offenders where serious and violent offenses occur at a higher rate.

Having acknowledged these possible challenges, the current study argues that the observed results are valid and that given the makeup of the current study sample and the predominantly non-violent forms of offending being considered as outcomes, it is not illogical that the results indicate that whites have both a higher prevalence and incidence of offending. The implication of the finding that whites in this sample were more likely to be involved in offending and offended at a higher rate than minorities suggests that studies that rely solely on official measures of delinquency or at-risk samples may overstate minority involvement in offending. As noted in Chapter 2, there has long been debate about whether the racial disproportionality observed in official measures of crime reflects differential involvement in offending by minorities or differential criminal justice selection of minority offenders. While this issue was not directly addressed in the current study, the finding that whites reported more involvement in offending than minorities suggests that differential selection is the driving force behind minority overrepresentation in official measures of offending rather than differential minority involvement in offending. Research should continue to address this issue utilizing data that includes both self-reports and official measures of offending.

As detailed in Chapter 1, Paternoster and colleagues (1997) offered a schema that classified criminological theories as either general or developmental. Their typology contrasted the parsimony of general theories with the complexity of developmental theories. They argued that general theories are preferable unless the added complexity of developmental theories is needed to better understand the etiology of offending. Contrary

to the predictions of developmental theories, the current study found little evidence of trajectory-specific etiologies. In general, risk and protective factors fared well in distinguishing between offenders and non-offenders but were less able to significantly distinguish between offending groups with different developmental patterns. The highest levels of risk were consistently observed for the trajectories with initially high probabilities of involvement in offending (adolescent-limiteds and high-level chronics) and the lowest levels of risk were consistently observed for the two groups with an initially low probability of involvement in offending (non-offenders and adolescent-escalators). This finding is consistent with previous research that has explored the ability of risk factors to distinguish offending trajectories (Chung et al., 2002; Fergusson et al., 2000; Jennings et al., 2010; Laub & Sampson, 2003; Maldonado-Molina et al., 2009; 2010; Piquero et al., 2002; Piquero et al., 2007; Wiesner & Capaldi, 2003; Wiesner & Windle, 2004).

Consistent with a general explanation of crime, in the full study sample, the adolescent-limited and high-level chronic trajectories were typically distinguished from the non-offender trajectory by the same risk and protective factors. Additionally, at the bivariate level of analysis, these two groups displayed similar mean levels of risk and protective factors. This finding is contrary to the predictions of developmental theories which posit that chronic and adolescent-peaked offending trajectories have unique etiologies. The developmental theories of Moffitt and Patterson both argue that peers represent the primary risk factor for adolescent-peaked offending while parenting and individual-level risk factors are most salient for chronic offenders. While greater perceived peer delinquency did emerge as a significant predictor of membership in the

adolescent-limited trajectory relative to the non-offender trajectory as predicted by developmental theories, it was also a significant predictor of membership in the high-level chronic group relative to the non-offender trajectory. Gender, prior delinquency, impulsivity, neighborhood disorganization, and early contact with the criminal justice system all predicted membership in both the adolescent-limited and high-level chronic offending trajectories relative to the non-offending trajectory in the full study sample suggesting that risk factors predict offending trajectories more generally than specifically. There was however an interesting difference between these two trajectories that emerged when examining the parenting measures in the full study sample; only maternal monitoring distinguished adolescent-limited offenders from non-offenders while only maternal attachment distinguished high-level chronic offenders from non-offenders. This suggests that perhaps parental monitoring is more salient for adolescent-limited offenders, while parental attachment is more salient for chronic offenders. The finding that greater parental attachment is negatively related to membership in the chronic offending trajectory is consistent with Moffitt's theoretical proposition that difficult children may interact with their environment and often have weak parental attachment as a result of their difficult temperament.

Findings from the race-specific risk and protective factor analyses indicated that several risk and protective factors significantly distinguished offending trajectories; however, study results also indicated that risk factors varied in their ability to distinguish offending trajectories across race and ethnicity. Gender and prior delinquency emerged as the strongest and most consistent risk factors distinguishing trajectories in general and in all three race-specific models (although gender effects were stronger among minorities).

Additionally, neighborhood disorganization, perceived peer delinquency, impulsivity, and cognitive functioning emerged as significant predictors of group membership in at least two of the three racially-disaggregated models. Overall, a greater number of risk and protective factors emerged as significant discriminators between offending groups for whites relative to either blacks or Hispanics suggesting that some risk and protective factors may have differential salience for predicting group membership across race and ethnicity; a possibility that is not acknowledged by any of the theories reviewed in Chapter 3. These findings provide mixed support for the fourth study hypothesis which predicted that risk factors would distinguish offending trajectories universally across race and ethnicity. While a core set of risk factors (gender, prior delinquency, cognitive functioning and neighborhood disorganization) distinguished offending trajectories from non-offenders generally across race and ethnicity, several risk and protective factors (e.g., maternal monitoring, maternal attachment, early arrest, poverty) were shown to have race-specific effects. Contrary to the fifth study hypothesis which predicted that structural-level risk factors would be more salient among minorities, no evidence of differential impact of structural factors was observed for either minority group.

Implications for DLC Theories

Overall, the current study findings provide more support for general over developmental theories of offending. As noted in Chapter 3, the debate between general and developmental theories is in many ways a debate between parsimony and complexity. In suggesting that multiple pathways to delinquency with unique etiologies exist, developmental theories present a more complex causal model than general theories which predict universal causation of all types of offending. The added complexity of

developmental theories is justified only if there is evidence that multiple pathways with unique etiologies do in fact exist (Paternoster et al., 1997). While the current study, consistent with previous research utilizing the trajectory methodology, did clearly identify heterogeneity in developmental patterns of offending, it did not find conclusive evidence supporting the prediction of trajectory-specific etiologies. In the full study sample, a majority of the risk factors that emerged as significant predictors of trajectory group membership had general effects. More specifically, most risk factors distinguished offenders from non-offenders, but not between offending trajectories with different developmental patterns. The current study findings are consistent with previous research that has demonstrated that distinct developmental trajectories do not require unique theoretical explanations (Chung et al., 2002; Fergusson et al., 2000; Laub & Sampson, 2003).

The finding that there was considerable generality in the risk and protective factors that distinguished offending trajectories in the full study sample lends support to the predictions of general theories; however, the study findings do not provide a great deal of support for either Gottfredson and Hirschi's or Sampson and Laub's general theories. While general mechanisms appeared to distinguish offending trajectories, the covariates that emerged as significant discriminators of offending trajectories were not fully consistent with the causal models predicted by either of the general theories guiding the current research. More specifically, while individual-level and parental risk factors did emerge as significant predictors of group membership, so too did peer and structural-level risk factors. The findings of the current study are more consistent with the less theoretical risk factor paradigm which argues that a greater number of risk factors predict

involvement in more serious and prolonged offending (Loeber & Farrington, 1998; 2000). Risk and protective factors from each key risk domain emerged as significant discriminators between offending trajectories. The theoretical implication of this finding is that it suggests that general theories of offending like Gottfredson and Hirschi's self-control theory or Sampson and Laub's age-graded theory of social control may oversimplify the causal mechanisms that underlie all types of offending and all types of offenders.

The fact that several empirical studies (including the current one) employing the trajectory methodology have failed to find trajectory-specific etiologies is somewhat problematic for developmental theories like Moffitt's dual taxonomy. While nearly every application of the trajectory methodology has yielded developmental trajectories that resemble those predicted by Moffitt's theory, very few studies have had success in distinguishing between these two divergent trajectories using only the risk factors predicted by Moffitt. Unfortunately, the current study does not directly measure the mechanisms predicted by Moffitt to distinguish between life-course persistent and adolescent-limited offenders and therefore the conclusion that trajectory-specific etiologies are not necessary must be tempered to some degree. That caveat aside, the current study adds to the growing body of research which suggests that the risk factors that distinguish offending trajectories are more general than specific.

The finding that risk factors do not clearly differentiate between trajectories with divergent patterns of offending is supportive of a conclusion drawn by Laub and Sampson (2003: 288) that "offender groupings follow a fairly continuous distribution across variables". Simply put, this suggests that varying levels of the same factors, rather

than group-specific factors, distinguish offender groupings. Laub and Sampson caution against relying on static risk factors as predictors of long-term patterns of offending due to the great deal of heterogeneity that exists in these patterns over time. The current study findings support this cautionary note. Although several risk factors emerged as significant predictors of membership in one of the two trajectories with an initially high probability of involvement in offending, most risk factors did not significantly vary across these two trajectories which displayed considerably divergent patterns of offending over the study period. Unless risk factors can reliably distinguish divergent offending trajectories from one another, their utility for the field is limited. In order to address this limitation, future research should focus on identifying the key factors (if any) that can reliably distinguish between offending trajectories with divergent patterns.

Implications for Race and Crime

The current study found considerable similarities across race and ethnicity regarding the number and shape of offending trajectories. By illustrating that the patterns of offending that have been consistently found within white and mixed race samples can be replicated in minority samples, the current study adds to the growing body of research that has established the validity of several of these offending trajectories in minority samples (Cohen et al., 2010; Jennings et al., 2010; Maldonado-Molina et al., 2009; 2010; Reitzel, 2006). While the finding of general patterns of offending across race and ethnicity could be interpreted as evidence that examining racially-disaggregated trajectory models is unnecessary given the added complexity they introduce, the current study cautions against drawing this conclusion from these findings. Instead, the current study sides with Cohen and colleagues (2010) and Reitzel (2006) in suggesting that

researchers should continue to explore race-specific trajectory models. While similarities in the number and shape of offending trajectories emerged in the current study, the study did not find that most risk factors distinguished offending trajectories in a racially invariant way. Additionally, previous research has found that aggregate trajectory models mask important racial differences especially when violent offending outcomes are examined (Cohen et al., 2010; Reitzel, 2006). Further investigation is needed to explore the nuances of developmental patterns of offending across race and ethnicity and to better elucidate the risk factors that significantly distinguish trajectories both within and between racial and ethnic subgroups.

The finding that an adolescent-peaked and a chronic offending trajectory emerged in all three of the racially-disaggregated models speaks to the validity of Moffitt's dual taxonomy across race and ethnicity. While Moffitt's taxonomy was supported, her prediction that African-Americans would be found in a greater prevalence in both the adolescent-peaked and chronic offending trajectories was not supported within the current study sample. Unfortunately, the NLSY 1997 data did not allow for a full test of Moffitt's theory and therefore future research should follow the lead of Piquero and colleagues (2003; 2005) and focus on directly testing Moffitt's causal model within minority samples. Additionally, Moffitt's (1994) race hypothesis is in need of further empirical testing within different samples in order to assess whether or not the finding that whites are more prevalent in serious offending trajectories can be replicated. It is anticipated that different sources of data, especially data representing official measures of offending, will yield different findings regarding Moffitt's race hypothesis.

The most unique contribution of the current study was the examination of how risk and protective factors distinguished offending trajectories across race and ethnicity. While some interesting findings did emerge, the results of the risk factor analysis across racially-disaggregated models were somewhat inconclusive. While some risk factors (gender, prior delinquency, cognitive functioning and neighborhood disorganization) significantly distinguished offending trajectories in all three models, several additional risk and protective factors differentially distinguished offending trajectories across race and ethnicity. From the risk and protective factors that differentially distinguished offending trajectories across race and ethnicity it was difficult to discern a clear pattern of race-specific predictors. Impulsivity emerged as a significant discriminator between trajectories for whites and Hispanics, but not for blacks. Perceived peer delinquency distinguished trajectories for whites and blacks, but not for Hispanics. Parenting measures only distinguished trajectories for whites while school and early arrest only distinguished trajectories among blacks.

The current research sought to answer the question of whether risk factors varied in their ability to distinguish offending trajectories across race and ethnicity. The findings of the current study provided support for both general and race-specific effects of risk factors for distinguishing offending trajectories. Further research is needed to explore the differential effects of specific risk and protective factors for distinguishing trajectories across race and ethnicity in more depth and across other samples in order to increase the generalizability of the current study findings which suggest that some risk factors distinguish offending trajectories differentially across race and ethnicity. The key implication that emerges is if risk factors differentially predict offending trajectories across

race and ethnicity is that certain risk factors may have more salience for one racial or ethnic subgroup over another and therefore interventions may seek to address certain risk factors in race-specific ways. The current study findings fall well short of justifying race-specific interventions, but they do provide preliminary evidence that there may be some variability in the ability of risk factors to distinguish between offending trajectories across race and ethnicity. If race differences in the ability of risk and protective factors to distinguish offending trajectories continue to be found, DLC theories, which all predict racially invariant causal mechanisms, may need to be amended to account for the differential salience of some risk factors across race and ethnicity.

Limitations

While the current study advances knowledge regarding race differences in offending trajectories and the ability of risk factors to distinguish offending trajectories across race and ethnicity, the results should be considered in light of several limitations. First, as discussed in Chapter 5, the NLSY97 data only included self-reported measures of offending behaviors which have not been cross-validated. Despite several steps taken by the NLS staff to ensure the validity of these data (e.g., use of computer-assisted interviewing), the lack of validated measures of offending represents a key study limitation. Additionally, the lack of official offending measures prevented the current study from assessing potential issues of differential validity across race and ethnicity. This also prevented the current study from examining race differences in trajectories derived from official measures of offending. A meaningful avenue for future research might involve comparing race-specific trajectories of self-reported offending to race-

specific trajectories of officially-reported arrests in order to explore differences in findings across the models derived from these often conflicting data sources.

Second, the current study examined the ability of static risk and protective factors to distinguish offending trajectories only. This allowed the current study to explore the ability of risk factors measured in early adolescence to distinguish offending trajectories but did not allow the study to examine how changes in these risk factors over time may have been associated with offending trajectory membership. Prior research has indicated that changes in risk factors over time may be related to changes in patterns of offending (Horney et al., 1995; Piquero et al., 2002). Additionally, this limitation precluded the current study from assessing potential age-graded effects of risk factors which are predicted by both Sampson and Laub's life-course theory and the risk factor paradigm. Future research should examine the effects of time-varying covariates on trajectory group membership in general and across racially-disaggregated models.

Third, the current study did not examine trajectory models disaggregated by gender or offense type. Although similar offending trajectories have been observed across gender (Jennings et al., 2010), it is possible that there is an interactive effect of race and gender that differentially influenced the race-specific trajectory models estimated in the current study. It is also possible that race differences in trajectories of violent offending are masked when only aggregated offending trajectories are observed (Reitzel, 2006). Extant research suggests that race differences are most pronounced for violent and serious offenses. By not examining offense-specific offending trajectories, the current study potentially overlooks race differences that may have appeared in violent offending trajectories only. Future research should examine race and ethnicity-specific offending

trajectories disaggregated by gender and offense type in order to gain a more complete understanding of the potential differences that exist across subgroups. Future research should also utilize data that contain measures of more serious forms of offending such as homicide and robbery where racial disparities have been found to be most pronounced.

An additional limitation of the current study is that it did not distinguish between Hispanic subgroups based on ethnicity. Treating Hispanics as one subgroup masks potentially important within-ethnic group differences that may exist. In order to better understand how trajectories may vary within Hispanic populations, future research should focus on examining trajectories of offending across distinct subgroups of Hispanics.

A fifth limitation of the current study is that the risk and protective factors employed to distinguish offending trajectories were only rough indicators of the theoretical concepts implied by extant DLC theories. While the current study was guided by DLC theories, data limitations precluded the study from directly testing the propositions of any of the theories discussed in Chapter 3. Conclusions should not be drawn about the validity of one DLC theory over another based on the findings of the current study. The study focus was on exploring race-specific trajectories of offending and assessing how risk and protective factors distinguished between offending trajectories across race and ethnicity. Future research should strive to competitively test the propositions of extant DLC theories utilizing trajectory methods and validated measures of key theoretical constructs. An additional limitation related to the measurement of key independent variables concerns the low Cronbach's alpha values associated with some of the multiple item measures utilized in the study analyses. As discussed in Chapter 5, two measures in particular, the impulsivity scale and the school

environment index had poor internal consistency. Internal consistency was lowest when it was examined for specific subgroups (e.g., Hispanic females) and therefore raises potential concerns about the cross-cultural reliability of some of the included measures. Future research should utilize previously validated measures with better psychometric properties when they are available. The current study was limited in this capacity due to its reliance on secondary data.

A final limitation of the current study that warrants consideration concerns the length of the study observation period. While the current study examined trajectories across 11 years of development during a key period of the life-course, this represents only part of the individual life-course. Prior research has indicated that there is considerable variability in patterns of offending that continues to be observed into late adulthood (Bersani et al., 2009; Blokland & Nieuwbeerta, 2005; Laub & Sampson, 2003). The current study examined all available waves of the NLSY97 data, but it is possible that potentially relevant changes in trajectories of offending could still occur after the study observation period. This becomes an issue if there are racial differences in the changes that occur after the current study observation period. Future research should examine race-specific trajectories of offending over a longer period of the life-course. It is important to examine race differences in offending trajectories both earlier and later in the life-course than what was examined in the current study.

Policy Implications

Despite the more descriptive focus of the current study, these results do have some potential policy implications. Across all three racially-disaggregated models there was evidence that a considerable portion of the study cohort had a high probability of

involvement in offending at the initial wave of the current study. It was also clear that the more variety of delinquency youth were involved in before the study observation period began the more likely they were to follow a more serious offending trajectory over the course of the observation period. This suggests that youths initiated involvement in offending before mid-adolescence and therefore interventions should be targeted towards youth earlier in the life-course. Another potentially policy relevant finding was the fact that early contact with the criminal justice system distinguished the escalating offending trajectory from the non-offending trajectory in the black sample. Consistent with labeling theories, this suggests that official sanctioning may have contributed to involvement in more serious offending over the life-course, especially for African-Americans. As such, alternative sanctions may help avoid the stigma of a police record and avoid escalating involvement in offending. Use of alternative sanctions may be most important within minority populations where the stigma of a criminal record has been shown to be more difficult to overcome.

Conclusions

Despite these aforementioned limitations, the current study represents an important initial foray in the quest to examine the risk and protective factors that distinguish offending trajectories across race and ethnicity. The study results showed that the number of offender groups and the developmental patterns of offending that were observed in the NLSY97 data were more similar than different for whites, blacks, and Hispanics. These results support the notion that heterogeneity in the development of offending is universal across race and ethnicity and support the validity of the patterns of offending that have consistently been found in other samples.

The study findings addressing the ability of the risk and protective factors to distinguish offending trajectories across race and ethnicity indicated both similarities and differences across race and ethnicity. While a set of core risk factors did distinguish offending trajectories in all three race-specific models, several risk factors distinguished offending trajectories differentially across race and ethnicity. Risk and protective factors were differentially distributed across race and ethnicity with minority youth experiencing significantly higher levels of risk factors and significantly lower levels of protective factors and yet, many of these factors did not emerge as significant discriminators between offending trajectories for minorities. Prior research has consistently found that minorities experience greater levels of risk than whites, but the question that has remained unanswered is whether certain risk factors have differential salience across race and ethnicity? The current study findings provide preliminary evidence that risk and protective factors do in fact have differential salience for distinguishing offending trajectories across the life-course. Further research is clearly needed to potentially replicate these findings and gain a better understanding of the mechanisms that distinguish offending trajectories across race and ethnicity. Another question that remains largely unanswered by the current study findings is what risk and protective factors distinguish offending trajectories for minorities? (This issue has been explored in Hispanic samples: see Maldonado-Molina et al., 2009; 2010; Jennings et al., 2010). In the current study, most of the risk factors operated as expected and distinguished offending trajectories well in the white sample, but far fewer of the included risk and protective factors emerged as discriminators between offending trajectories for minorities.

The central motivating factor in the undertaking of this research was a desire to explore the role of race and ethnicity within the framework of developmental and life-course criminology. This is clearly an issue that cannot be fully addressed in a single study. Accordingly, the current study adopted a rather narrow focus on examining the ability of risk and protective factors to distinguish offending trajectories across race and ethnicity. In doing so, this study resulted in some interesting findings that raise some questions about the racial invariance of causal mechanisms within a developmental framework. Developmental theories have generally neglected race within the context of their explanatory models; typically suggesting that race does not matter because the causes of crime are the same across race and ethnicity (Moffitt 1994 is an exception), but race is an issue that clearly does matter in American society and does matter for the field of criminology. There is a considerable need for more research that incorporates race into the DLC framework and directly tests the propositions of DLC theories within minority populations.

Chapter 8: List of References

- Akers, R. L. (1998). *Social learning and social structure: A general theory of crime and deviance*. Boston: Northeastern University Press.
- Austin, R. L., & Allen, M. D. (2000). Racial disparity in arrest rates as an explanation of racial disparity in commitment to Pennsylvania's prisons. *Journal of Research in Crime and Delinquency*, 37(2), 200-220.
- Beckett, K., Nyrop, K., & Pflingst, L. (2006). Race, drugs, and policing: Understanding disparities in drug delivery arrests. *Criminology*, 44(1), 105-137.
- Bersani, B. E., Nieuwebeerta, P., & Laub, J. H. (2009). Predicting trajectories of offending over the life course: Findings from a Dutch conviction cohort. *Journal of Research in Crime and Delinquency*, 46(4), 468-494.
- Blokland, A. J., & Nieuwebeerta, P. (2005). The effects of life circumstances on longitudinal trajectories of offending. *Criminology*, 43(4), 1203-1240.
- Blumstein, A., Cohen, J., & Farrington, D. P. (1988). Criminal career research: Its value for criminology. *Criminology*, 26(1), 1-35.
- Blumstein, A., Cohen, J., Roth, J. A., & Visher, C. A. (1986). *Criminal careers and "career criminals", Vol 1. Report of the panel on criminal careers, National Research Council*. Washington D.C.: National Academy of Sciences.
- Broidy, L., Nagin, D. S., Tremblay, R. E., Bates, J. E., Brame, R., Dodge, K. A.,... Vitaro, F. (2003). Developmental trajectories of childhood disruptive behaviors and adolescent delinquency: A six-site, cross-national study. *Developmental Psychology*, 39(2), 222-245.
- Brooks-Gunn, J., Duncan, G. J., Klebanov, P. K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent development? *American Journal of Sociology*, 99(2), 353-395.
- Bureau of Labor Statistics (BLS). (2011). *Labor force statistics from the Current Population Survey*. Retrieved from <http://www.bls.gov/cps/tables.htm#charunem>.

- Center for Human Resource Research (2003). *NLSY97 User's Guide: A Guide to the Rounds 1-5 Data National Longitudinal Survey of Youth 1997*. Washington, D.C.: Bureau of Labor Statistics.
- Chambliss, W., & Nagasawa, R. (1969). On the validity of official statistics: A comparative study of white, black, and Japanese high school boys. *Journal of Research in Crime and Delinquency*, 6, 71-77.
- Child Trends, Inc. (1999). *NLSY97 Codebook Supplement Main File Round 1. Appendix 9: Family Process and Adolescent Outcome Measures*. Washington, D.C.: Bureau of Labor Statistics.
- Chung, I., Hill, K. G., Hawkins, J. D., & Nagin, D. S. (2002). Childhood predictors of offense trajectories. *Journal of Research in Crime and Delinquency*, 39, 60-90.
- Cohen, L. E., & Vila, B. J. (1996). Self-control and social control: An exposition of the Gottfredson-Hirschi/Sampson-Laub debate. *Studies on Crime and Crime Prevention*, 5(2), 125-150.
- Cohen, M. A., Piquero, A. R., & Jennings, W. G. (2010). Monetary costs of gender and ethnicity disaggregated group-based offending. *American Journal of Criminal Justice*, 35, 159-172.
- Cronbach, L. J. (1951). Coefficient Alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- D'Alessio, S. J., & Stolzenberg, L. (2003). Race and the probability of arrest. *Social Forces*, 81(4), 1381-1397.
- D'Unger, A. V., Land, K. C., & McCall, P. L. (2002). Sex differences in age patterns of delinquent/criminal careers: Results from Poisson latent class analyses of the Philadelphia Cohort Study. *Journal of Quantitative Criminology*, 18(4), 349-375.
- D'Unger, A. V., Land, K. C., McCall, P. L., & Nagin, D. S. (1998). How many latent classes of delinquent/criminal careers? Results from mixed poisson regression analyses of the London, Philadelphia, and Racine cohort studies. *American Journal of Sociology*, 103, 1593-1630.
- Elder, G. H., Jr. (1985). Perspectives on the life course. In G. H. Elder Jr. (Ed.), *Life Course Dynamics* (pp. 23-49). Ithaca, NY: Cornell University Press.
- Elliott, D. S. (1994). Serious violent offenders: Onset, developmental course, and termination – The American Society of Criminology 1993 presidential address. *Criminology*, 31(1), 1-21.

- Elliott, D. S., & Ageton, S. (1980). Reconciling race and class differences in self-reported and official estimates of delinquency. *American Sociological Review*, 45, 95-110.
- Elliott, D. S., Huizinga, D., & Morse, B. (1986). Self-reported violent offending: A descriptive analysis of juvenile offenders and their offending careers. *Journal of Interpersonal Violence*, 1(4), 472-514.
- Farrington, D. P. (1986). Age and crime. In M. Tonry & N. Morris (Eds.), *Crime and justice: An annual review of research*, vol. 7. Chicago: University of Chicago Press.
- Farrington, D. P. (2003). Developmental and life-course criminology: Key theoretical and empirical issues—the 2002 Sutherland Award Address. *Criminology*, 41(2), 221-255.
- Farrington, D. P. (2005). Introduction to integrated developmental and life-course theories of offending. In D. P. Farrington (Ed.), *Integrated developmental & life-course theories of offending* (pp. 1-14). New Brunswick, NJ: Transaction Publishers.
- Farrington, D. P. (2006). Building developmental and life-course theories of offending. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory* (pp. 335-364). Advances in criminological theory. Volume 15. New Brunswick, NJ: Transaction.
- 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: Cambridge University Press.
- 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(4), 493-517.
- Fergusson, D. M., Horwood, L. J., & Nagin, D. S. (2000). Offending trajectories in a New Zealand birth cohort. *Criminology*, 38(2), 525-551.
- Fox, J. A., & Zawitz, M. W. (2007). *Homicide trends in the United States*. Washington, DC: Office of Justice Programs, Bureau of Justice Statistics.
- Goodwin, P. Y., McGill, B., & Chandra, A. (2009). *Who marries and when? Age at first marriage in the United States, 2002*. NCHS data brief, no 19. Hyattsville, MD: National Center for Health Statistics.

- Goodwin, P. Y., Mosher, W. D., & Chandra, A. (2010) Marriage and cohabitation in the United States: A statistical portrait based on Cycle 6 (2002) of the National Survey of Family Growth. National Center for Health Statistics. *Vital and Health Statistics* 23(28), 1-55.
- Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- Gould, L. (1969). Who defines delinquency: A comparison of self-reported and officially-reported indices of delinquency for three racial groups. *Social Problems*, 16, 325-336.
- Greenberg, D. F. (1985). Age, crime, and social explanation. *American Journal of Sociology*, 91(1), 1-21.
- Groves, W. B., & Frank, N. (1993). Punishment, privilege, and structured choice. In G. R. Newman, M. J. Lynch, & D. H. Galaty (Eds.), *Discovering criminology: From W. Byron Groves* (pp. 246-257). New York, NY: Harrow and Heston Publishers.
- Hannaford, I. (1996). *Race: The history of an idea in the West*. Washington, DC: The Woodrow Wilson Press.
- Hawkins, D. F. (2003). Editor's introduction. In D. F. Hawkins (Ed.), *Violent crime: Assessing race and ethnic differences* (pp. xiii-xxv). New York: Cambridge University Press.
- Hawkins, D. F., Laub, J. H., & Lauritsen, J. L. (1998). Race, ethnicity, and serious juvenile offending. In R. Loeber & D. P. Farrington (Eds.), *Serious & violent juvenile offenders: Risk factors and successful interventions* (pp. 30-46). Thousand Oaks, CA: Sage.
- Haynie, D. L., Weiss, H. E., & Piquero, A. R. (2008). Race, the economic maturity gap, and criminal offending in young adulthood. *Justice Quarterly*, 25(4), 595-622.
- Higgins, G. E., Bush, M. D., Marcum, C. D., Ricketts, M. L., & Kirchner, E. E. (2010). Ensnared into crime: A preliminary test of Moffitt's snares hypothesis in a national sample of African Americans. *Journal of Ethnicity in Criminal Justice*, 8, 181-200.
- Hill, S. A. (2001). Class, race, and gender dimensions of child rearing in African-American families. *Journal of Black Studies*, 31(4), 494-508.
- Hindelang, M. J. (1978). Race and involvement in common law personal crimes. *American Sociological Review*, 43, 93-109.

- Hindelang, M. J., Hirschi, T., & Weis, J. G. (1981). *Measuring delinquency*. Beverly Hills, CA: Sage.
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley, CA: University of California Press.
- Hirschi, T., & Gottfredson, M. R. (1983). Age and the explanation of crime. *American Journal of Sociology*, 89(3), 552-584.
- Hirschi, T., & Gottfredson, M. R. (1994). The generality of deviance. In T Hirschi & M. R. Gottfredson (Eds.), *The generality of deviance* (pp. 1-22). New Brunswick, NJ: Transaction.
- Hirschi, T., & Gottfredson, M. R. (1995). Control theory and the life-course perspective. *Studies on Crime Prevention*, 4(2), 131-142.
- Horney, J., Osgood, D. 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.
- Huizinga, D., & Elliott, D. S. (1986). Re-assessing the reliability and validity of self-report delinquency measures. *Journal of Quantitative Criminology*, 2, 293-327.
- Human Rights Watch. (2009). *Decades of disparity: Drug arrests and race in the United States*. New York: Human Rights Watch.
- Jennings, W. G., Maldonado-Molina, M. M., Piquero, A. R., Odgers, C. L., Bird, H., & Canino, G. (2010). Sex differences in trajectories of offending among Puerto Rican youth. *Crime & Delinquency*, 56(3), 327-357.
- Jennings, W. G., Maldonado-Molina, M. M., Reingle, J. M., & Komro, K. A. (2011). A multi-level approach to investigating neighborhood effects on physical aggression among urban Chicago youth. *American Journal of Criminal Justice, Online First*, 1-16. DOI: 10.1007/s12103-011-9118-2.
- Jones, B. L., Nagin, D. S., & Roeder, K. (2001). A SAS procedure based on mixture models for estimating developmental trajectories. *Sociological Methods & Research*, 29(3), 374-393.
- Kempf. (1993). The empirical status of Hirschi's control theory. In F. Adler & W. Laufer (Eds.), *New directions in criminological theory. Advances in criminological theory, vol. 4* (pp. 143-186). New Brunswick, NJ: Transaction.
- Krivo, L. J., & Peterson, R. D. (2000). The structural context of homicide: Accounting for racial differences in process. *American Sociological Review*, 65, 547-559.

- LaFree, G. (1995). Race and crime trends in the United States, 1946-1990. In D. F. Hawkins (Ed.), *Ethnicity, race, and crime: Perspectives across time and place* (pp. 169-193). Albany, NY: State University of New York Press.
- Lareau, A. (2002). Invisible inequality: Social class and childrearing in black families and white families. *American Sociological Review*, *67*, 747-776.
- Laub, J. H., Nagin, D. S., & Sampson, R. J. (1998). Trajectories of change in criminal offending: Good marriages and the desistance process. *American Sociological Review*, *63*, 225-238.
- Laub, J. H., & Sampson, R. J. (1993). Turning points in the life course: Why change matters to the study of crime. *Criminology*, *31*(3), 301-325.
- Laub, J. H., & Sampson, R. J. (2003). *Shared beginnings, divergent lives: Delinquent boys to age 70*. Cambridge, MA: Harvard University Press.
- Laub, J. H., Sampson, R. J., & Sweeten, G. A. (2006). Assessing Sampson and Laub's life-course theory of crime. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory. Advances in criminological theory, vol. 15* (pp. 313-333). New Brunswick, NJ: Transaction.
- Lauritsen, J. L. (2005). Racial and ethnic differences in juvenile offending. In D. Hawkins & K. Kempf-Leonard (Eds.), *Our children, their children: Race, crime, and the juvenile justice system* (pp. 83-104). Chicago: University of Chicago Press.
- Leach, E. (1975). Cultural components in the concept of race. In F. J. Ebling (Ed.), *Racial variations in man*. London: Blackwell Press.
- Leiber, M. J. (2008). Theories of racial and ethnic bias in juvenile and criminal justice. In M. J. Lynch, E. B. Patterson, & K. K. Childs (Eds.), *Racial divide: Racial and ethnic bias in the criminal justice system* (pp. 15-38). Monsey, NY: Criminal Justice Press.
- Leiber, M. J., Mack, K. Y., & Featherstone, R. A. (2009). Family structure, family processes, economic factors, and delinquency: Similarities and differences by race and ethnicity. *Youth Violence and Juvenile Justice*, *7*(2), 79-99.
- Lieberman, L., & Reynolds, L. (1978). The debate over race: An empirical investigation. *Phylon*, *39*(4), 333-343.
- Loeber, R., & Farrington, D. P. (1998). *Serious and violent juvenile offenders: Risk factors and successful interventions*. Thousand Oaks, CA: Sage.

- Loeber, R., & Farrington, D. P. (2000). Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. *Development and Psychopathology*, 12, 737-762.
- Lynch, M. J. (1998). Review essay: An historical and “scientific” examination of the social construction of race. *Social Pathology*, 4(2), 125-133.
- Lynch, M. J. (1999). Class, race, gender and criminology: Structured choices and the life course. In D. Milovanovic & M. D. Schwartz (Eds.), *Race, gender, and class in criminology: The intersections* (pp. 3-28). New York, NY: Garland Publishing.
- Lynch, M. J., & Michalowski, R. J. (2006). *A primer in radical criminology: Critical perspectives on crime, power & identity* (4th ed.). Monsey, NY: Criminal Justice Press.
- Lynch, M. J., Patterson, E. B., & Childs, K. K. (2008). The context of racial and ethnic bias in criminal justice processes. In M. J. Lynch, E. B. Patterson, & K. K. Childs (Eds.), *Racial divide: Racial and ethnic bias in the criminal justice system* (pp. 1-14). Monsey, NY: Criminal Justice Press.
- Maldonado-Molina, M. M., Piquero, A. R., Jennings, W. G., Bird, H., & Canino, G. (2009). Trajectories of delinquency among Puerto Rican children and adolescents at two sites. *Journal of Research in Crime and Delinquency*, 46(2), 144-181.
- Maldonado-Molina, M. M., Reingle, J. M., Tobler, A. L., Jennings, W. G., & Komro, K. A. (2010). Trajectories of physical aggression among Hispanic urban adolescents and young adults: An application of latent trajectory modeling from ages 12 to 18. *American Journal of Criminal Justice*, 35, 121-133.
- Massey, D., & Denton, S. (1994). *American apartheid: Segregation and the making of the American underclass*. Cambridge, MA: Harvard University Press.
- Maxfield, M. G., Weiler, B. L., & Widom, C. S. (2000). Comparing self-reports and official records of arrest. *Journal of Quantitative Criminology*, 16(1), 87-110.
- Mitchell, O. J. (2009). Is the War on Drugs racially biased? *Journal of Crime and Justice*, 32, 49-75.
- Mitchell, O. J., & Lynch, M. J. (2011). Racial disparities in drug arrests. In N. Parsons-Pollard (Ed.), *Disproportionate minority contact: Historical and contemporary perspectives*. Durham, NC: Carolina Academic Press.
- Mieczkowski, T. (2000). Any visible admixture: Revisiting race as an analytic variable in research. *Social Pathology*, 6(3), 165-181.

- Mieczkowski, T. (2008). The things that pass for knowledge: Racial identity in forensics. In M. J. Lynch, E. B. Patterson, & K. K. Childs (Eds.), *Racial divide: Racial and ethnic bias in the criminal justice system* (pp. 211-240). Monsey, NY: Criminal Justice Press.
- Moore, W., Pedlow, S., Krishnamurty, P., & Wolter, K. (2000). *National Longitudinal Survey of Youth 1997 (NLSY97): Technical Sampling Report*. Washington, D.C.: National Opinion Research Center.
- Morenoff, J. D. (2005). Racial and ethnic disparities in crime and delinquency in the United States. In M. Rutter & M. Tienda (Eds.), *Ethnicity and causal mechanisms* (pp. 139-173). New York, NY: Cambridge University Press.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*(4), 674-701.
- Moffitt, T. E. (1994). Natural histories of delinquency. In E. G. M. Weitekamp & H. -J. Kerner (Eds.), *Cross-national longitudinal research on human development and criminal behavior* (pp. 3-61). Dordrecht, Netherlands: Kluwer Academic Publishers.
- Moffitt, T. E. (2006a). A review of research on the taxonomy of life-course persistent versus adolescence-limited antisocial behavior. In F. T. Cullen, J. P. Wright, & K. R. Blevins (Eds.), *Taking stock: The status of criminological theory. Advances in criminological theory, vol. 15* (pp. 277-312). New Brunswick, NJ: Transaction.
- Moffitt, T. E. (2006b). Life-course-persistent versus adolescence-limited antisocial behavior. In D. Cicchetti & D. J. Cohen (Eds.), *Developmental psychopathology, Vol 3: Risk, disorder, and adaptation* (pp. 570-598). Hoboken, NJ: John Wiley & Sons.
- Nagin, D. S. (1999). Analyzing developmental trajectories: A semiparametric, group-based approach. *Psychological Methods*, *4*(2), 139-157.
- Nagin, D. S. (2005). *Group-based modeling of development*. Cambridge, MA: University of Harvard Press.
- 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.
- Nagin, D. S., & Paternoster, R. (1991). On the relationship of past to future participation in delinquency. *Criminology*, *29*(2), 163-189.
- Pager, D. (2004). The mark of a criminal record. *Focus*, *23*(2), 44-46.

- Paternoster, R., Dean, C. W., Piquero, A. R., Mazerolle, P., & Brame, R. (1997). Generality, continuity, and change in offending. *Journal of Quantitative Criminology*, *13*(3), 231-266.
- Paternoster, R., & Brame, R. (1997). Multiple routes to delinquency? A test of developmental and general theories of crime. *Criminology*, *35*(1), 49-84.
- Patterson, G. R. (1993). Orderly change in a stable world: The antisocial trait as a chimera. *Journal of Consulting and Clinical Psychology*, *61*(6), 911-919.
- Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist*, *44*(2), 329-335.
- Patterson, G. R., Forgatch, M. S., Yoerger, K., & Stoolmiller, M. (1998). Variables that initiate and maintain an early-onset trajectory for juvenile offending. *Development and Psychopathology*, *10*, 541-547.
- Patterson, G. R., & Yoeger, K. (1993). Developmental models for delinquent behavior. In S. Hodgins (Ed.), *Mental Disorder and Crime* (pp.140-172). Newbury Park, CA: Sage.
- Patterson, G. R., & Yoeger, K. (1999). Intraindividual growth in covert antisocial behaviour: A necessary precursor to chronic juvenile and adult arrests? *Criminal Behaviour and Mental Health*, *9*, 24-38.
- Peterson, R. D., Krivo, L. J., & Hagan, J. (2006). Introduction: Inequalities of race, ethnicity, and crime in America. In R. D. Peterson, L. J. Krivo, & J. Hagan (Eds.), *The many colors of crime: Inequalities of race, ethnicity, and crime in America* (pp. 1-7). New York: New York University Press.
- Piquero, A. R. (2008). Taking stock of developmental trajectories of criminal activity over the life-course. In A. M. Liberman (Ed.), *The long view of crime: A synthesis of longitudinal research*. New York: Springer.
- Piquero, A. R., & Brame, R. (2008). Assessing the race-crime and ethnicity-crime relationship in a sample of serious adolescent delinquents. *Crime & Delinquency*, *54*(3), 390-422.
- Piquero, A. R., & Brame, R., Mazerolle, P., & Haapanen, R. (2002). Crime in emerging adulthood. *Criminology*, *40*(1), 137-170.
- Piquero, A. R., Brame, R., & Moffitt, T. E. (2005). Extending the study of continuity and change: Gender differences in adolescent and adult offending. *Journal of Quantitative Criminology*, *21*, 219-243.

- Piquero, A. R., Farrington, D. P., & Blumstein, A. (2007). *Key issues in criminal career research: New analyses of the Cambridge Study in Delinquent Development*. New York, NY: Cambridge University Press.
- Piquero, A. R., MacDonald, J. M., & Parker, K. F. (2002). Race, local life circumstances and criminal activity. *Social Sciences Quarterly*, 83(2), 654-670.
- Piquero, A. R., & Moffitt, T. E. (2005). Explaining the facts of crime: How the developmental taxonomy replies to Farrington's invitation. In D. P. Farrington (Ed.), *Integrated developmental & life-course theories of offending. Advances in criminological theory, vol. 14.* (pp. 51-72). New Brunswick, NJ: Transaction.
- Piquero, A. R., Moffitt, T. E., & Lawton, B. (2005). Race and crime: The contribution of individual, familial, and neighborhood level risk factors to life-course-persistent offending. In D. Hawkins & K. Kempf-Leonard (Eds.), *Our children, their children: Race, crime, and the juvenile justice system* (pp. 202-244). Chicago: University of Chicago Press.
- Piquero, A. R., & White, N. A. (2003). On the relationship between cognitive abilities and life-course-persistent offending among a sample of African Americans: A longitudinal test of Moffitt's hypothesis. *Journal of Criminal Justice*, 31, 399-409.
- Pratt, T. C., & Cullen, F. T. (2000). The empirical status of Gottfredson and Hirschi's General Theory of Crime: A meta-analysis. *Criminology*, 38, 931-964.
- Pratt, T. C., Turner, M. G., & Piquero, A. R. (2004). Parental socialization and community context: A longitudinal analysis of the structural sources of low self-control. *Journal of Research in Crime and Delinquency*, 41, 219-243.
- Quetelet, A. (1984). *Research on the propensity for crime at different ages*. S. F. Sylvester, Trans.). Cincinnati, OH: Anderson. (Original work published 1831).
- Reitzel, J. D. (2006). Race differences in persistence/desistance: A trajectory analysis of serious youthful offenders followed into adulthood. (Doctoral dissertation). Retrieved from dissertation abstracts international. (AAT 3392695).
- Robins, L. N. (1978). Sturdy childhood predictors of adult antisocial behaviour: replications from longitudinal studies. *Psychological Medicine*, 8, 611-622.
- Roeder, K., Lynch, K. G., & Nagin, D. S. (1999). Modeling uncertainty in latent class membership: A case study in criminology. *Journal of the American Statistical Association*, 94(447), 766-776.
- Rosich, K. J. (2007). *Race, ethnicity, and the criminal justice system*. Washington, DC: American Sociological Association.

- Rowe, D. C., Vazsonyi, A. T., & Flannery, D. J. (1994). No more than skin deep: Ethnic and racial similarity in developmental process. *Psychological Review*, *101*(3), 396-413.
- Sampson, R. J. (1997). The embeddedness of child and adolescent development: A community-level perspective on urban violence. In J. McCord (Ed.), *Violence and childhood in the inner city* (pp. 31-77). Cambridge: Cambridge University Press.
- Sampson, R. J., & Groves, W. B. (1989). Community structure and crime: Testing social-disorganization theory. *American Journal of Sociology*, *94*, 774-802.
- 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. (1995). Understanding variability in lives through time: Contributions of life-course criminology. *Studies on Crime and Crime Prevention*, *4*, 143-158.
- Sampson, R. J., & Laub, J. H. (1997). A life-course theory of cumulative disadvantage and the stability of delinquency. In T. P. Thornberry (Ed.), *Developmental theories of crime and delinquency: Advances in criminological theory*, vol. 7 (pp. 133-161). New Brunswick, NJ: Transaction.
- Sampson, R. J., & Laub, J. H. (2003). Life-course desisters? Trajectories of crime among delinquent boys followed to age 70. *Criminology*, *41*(3), 301-340.
- Sampson, R. J., & Laub, J. H. (2005a). A general age-graded theory of crime: Lessons learned and the future of life-course criminology. In D. P. Farrington (Ed.), *Integrated developmental & life-course theories of offending. Advances in criminological theory*, vol. 14 (pp. 165-182). New Brunswick, NJ: Transaction.
- Sampson, R. J., & Laub, J. H. (2005b). A life-course view of the development of crime. *The ANNALS of the American Academy of Political and Social Science*, *602*, 12-45.
- Sampson, R. J., & Lauritsen, J. L. (1997). Racial and ethnic disparities in crime and criminal justice in the United States. In M. Tonry (Ed.), *Ethnicity, crime, and immigration: Comparative and cross-national perspectives, crime and justice. An annual Review of Research Vol. 21* (pp. 311-374). Chicago: University of Chicago Press.
- Sampson, R. J., Morenoff, J. D., & Raudenbush, S. W. (2005). Social anatomy of racial and ethnic disparities in violence. *American Journal of Public Health*, *95*, 224-232.

- Sampson, R. J., & Wilson, W. J. (1995). Toward a theory of race, crime, and urban inequality. In J. Hagan & R. D. Peterson (Eds.), *Crime and inequality* (pp. 37-54). Stanford, CA: Stanford University Press.
- Shipman, P. (1994). *The evolution of racism: Human differences and the use and abuse of science*. New York: Simon and Schuster.
- Simons, R. L., Stewart, E., Gordon, L. C., Conger, R. D., & Elder, G. H. (2002). A test of life-course explanations for stability and change in antisocial behavior from adolescence to young adulthood. *Criminology*, 40(2), 401-434.
- South, S. J., & Messner, S. F. (2000). Crime and demography: Multiple linkages, reciprocal relations. *Annual Review of Sociology*, 26, 83-106.
- Substance Abuse and Mental Health Services Administration. (2008). *Results from the 2007 National Survey on Drug Use and Health: National Findings* (Office of Applied Studies, NSDUH Series H-34, DHHS Publication No. SMA 08-4343). Rockville, MD: Office of Applied Studies.
- Sunderland, E. (1975). Biological components of the races of man. In F. J. Ebling (Ed.), *Racial variations in man*. London: Blackwell Press.
- Thornberry, T. P. (1997). Introduction: Some advantages of developmental and life-course perspectives for the study of crime and delinquency. In T. P. Thornberry (Ed.), *Developmental theories of crime and delinquency: Advances in criminological theory*, vol. 7 (pp. 1-10). New Brunswick, NJ: Transaction.
- Thornberry, T. P., & Krohn, M. D. (2002). Comparison of self-report and official data for measuring crime. In J. V. Pepper & C. V. Petrie (Eds.), *Measurement problems in criminal justice research: Workshop summary*. Washington, DC: National Academies Press.
- Tonry, M. (1995). *Malign neglect: Race, crime and punishment in America*. New York: Oxford University Press.
- U.S. Census Bureau. (2009). *United States – ACS Demographic and Housing Estimates: 2006-2008*. Washington, DC: U.S. Census Bureau.
- U.S. Department of Justice. (2010). *Crime in the United States – 2009*. Washington, DC: U.S. Department of Justice – Federal Bureau of Investigation.
- Warr, M. (1998). Life-course transitions and desistance from crime. *Criminology*, 36(2), 183-216.

- Wiesner, M., & Capaldi, D. M. (2003). Relations of childhood and adolescent factors to offending trajectories of young men. *Journal of Research in Crime and Delinquency*, 40(3), 231-262.
- Wiesner, M., & Windle, M. (2004). Assessing covariates of adolescent delinquency trajectories: A latent growth mixture modeling approach. *Journal of Youth and Adolescence*, 33(5), 431-442.
- Western, B. (2006). *Punishment and inequality in America*. New York: Russell Sage Foundation Publications.
- White, J. L., Moffitt, T. E., Earls, F., Robins, L. N., & Silva, P. A. (1990). How early can we tell? Predictors of childhood conduct disorder and adolescent delinquency. *Criminology*, 28(4), 507-535.
- Wolfgang, M. E., Thornberry, T. P., & Figlio, R. M. (1987). *From boy to man, from delinquency to crime*. Chicago: University of Chicago Press.
- Wright, B. R. E., Caspi, A., Moffitt, T. E., & Silva, P. A. (1999). Low self-control, social bonds, and crime: Social causation, social selection, or both? *Criminology*, 37(3), 479-514.
- Wright, J. P., & Cullen, F. T. (2004). Employment, peers, and life-course transitions. *Justice Quarterly*, 21(1), 183-205.

Appendix A: Additional Tables

Table A1*Delinquency Items*

Have you used Marijuana since the date of your last interview?

Have you used Cocaine, Crack, Heroin, or any other hard drugs since the date of your last interview?*

Since the date of your last interview, have you sold or helped sell Marijuana or other hard drugs such as Heroin, Cocaine or LSD?

Since the date of your last interview, have you purposely damaged or destroyed property that did not belong to you?

Since the date of your last interview, have you stolen something from a store or something that did not belong to you worth less than \$50?

Since the date of your last interview, have you stolen something from a store or something that did not belong to you worth more than \$50 including stealing a car?

Since the date of your last interview, have you committed other property crimes?

Since the date of your last interview, have you attacked someone with the idea of seriously hurting them or have had a situation end up in a serious fight or assault of some kind?

*Item not included until wave 3 of data collection (1999)

Table A2

Full Multinomial Regression Results with Adolescent-Limiteds as Reference Group – Full Sample (n=3,416)

Variables (reference)	Non-Offenders ¹ G1		Adolescent-Escalators ¹ G2		High-Level Chronics ¹ G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
	Race					
Black (white)	1.49**	1.31	1.46	1.33	.95	.99
Hispanic (white)	1.36*	1.22	.99	.93	1.30	1.31
Gender (female)	.59****	.72***	1.33	1.53**	1.23	1.13
Prior Delinquency	--	.60****	--	.73****	--	1.15***
Impulsivity	.80****	.93	.91	1.01	.99	.92
Cognitive functioning	1.00	1.00	1.01****	1.01****	1.01**	1.01*
Learning disability (no)	1.08	1.12	.88	.92	.85	.83
Early arrest (no)	.62*	1.70*	.76	1.47	1.36	1.05
Maternal attachment	1.01	1.01	1.00	.99	.96**	.96**
Maternal monitoring	1.07***	1.03	1.04	1.02	1.03	1.04
Perceived peer delinquency	.90**	.99	.95	1.01	1.13**	1.08
School environment	1.17***	1.12*	1.29***	1.25**	1.06	1.06
Environmental risk index	1.00	1.00	.93	.93	.96	.95
Neighborhood disorg. (no)	.74**	.88	1.11	1.24	.98	.93
Household poverty (no)	.94	.97	1.17	1.20	.66*	.67*
Model fit	Unadjusted: $\chi^2=301.56****$ ($R^2=.14$) [♦]			Adjusted: $\chi^2=530.04****$ ($R^2=.24$) [♦]		

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
*p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R^2 reflects Cox and Snell Pseudo R-Square.

¹G3 (adolescent-limiteds) is reference group

Table A3

Full Multinomial Regression Results with Adolescent-Limiteds as Reference Group – White Sample (n=1,776)

Variables (reference)	Non-Offenders ¹ G1		Adolescent-Escalators ¹ G2		High-Level Chronics ¹ G4	
	Odds	Odds	Odds	Odds	Odds	Odds
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Gender (female)	.73*	.92	1.14	1.34	1.11	1.02
Prior Delinquency	--	.56****	--	.70****	--	1.13**
Impulsivity	.76****	.90	.86	.96	.99	.93
Cognitive functioning	1.01**	1.01*	1.02****	1.02****	1.01***	1.01**
Learning disability (no)	1.35	1.35	.77	.80	.94	.90
Early arrest (no)	.60	1.68	.22*	.44	1.13	.92
Maternal attachment	1.02	1.02	.98	.98	.95**	.95**
Maternal monitoring	1.12****	1.07**	1.05	1.03	1.07*	1.08**
Perceived peer delinquency	.86**	.98	.93	1.02	1.09	1.05
School environment	1.06	1.00	1.16	1.10	.97	.97
Environmental risk index	1.04	1.07	.94	.95	1.02	1.00
Neighborhood disorg. (no)	.82	.95	1.31	1.43	1.26	1.24
Household poverty (no)	.60**	.56**	.93	.90	.41**	.43**
Model fit	Unadjusted: $\chi^2=220.66****$ ($R^2=.18$) [♦]			Adjusted: $\chi^2=365.52****$ ($R^2=.28$) [♦]		

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
*p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G3 (adolescent-limiteds) is reference group

Table A4

Full Multinomial Regression Results with Adolescent-Limiteds as Reference Group – Black Sample (n=914)

Variables (reference)	Non-Offenders ¹		Adolescent-Escalators ¹		High-Level Chronics ¹	
	G1		G2		G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
Gender (female)	.37****	.42***	1.94	2.11*	1.39	1.24
Prior Delinquency	--	.65****	--	.80*	--	1.29**
Impulsivity	.93	1.01	1.20	1.23	1.13	1.04
Cognitive functioning	.99	1.00	1.01	1.01	1.00	1.00
Learning disability (no)	.77	.92	1.61	1.81	.40	.41
Early arrest (no)	.47	1.14	1.36	2.16	.79	.49
Maternal attachment	.99	.97	1.00	.99	.94	.96
Maternal monitoring	1.01	.99	1.04	1.02	1.04	1.05
Perceived peer delinquency	.97	1.01	1.14	1.17	1.29**	1.23
School environment	1.32***	1.25**	1.24	1.21	1.05	1.05
Environmental risk index	.91	.89	.90	.91	.90	.93
Neighborhood disorg. (no)	.56**	.67	.87	.94	.55	.46*
Household poverty (no)	1.11	1.16	1.06	1.08	1.07	1.04
Model fit	Unadjusted: $\chi^2=88.54****$ ($R^2=.18$) [♦]			Adjusted: $\chi^2=131.92****$ ($R^2=.25$) [♦]		

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
*p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G3 (adolescent-limiteds) is reference group

Table A5

Full Multinomial Regression Results with Adolescent-Limiteds as Reference Group – Hispanic Sample (n=726)

Variables (reference)	Non-Offenders ¹		High-Level Chronics ¹	
	G1		G4	
	Odds Unadjusted	Odds Adjusted	Odds Unadjusted	Odds Adjusted
Gender (female)	.45**	.55**	1.15	1.03
Prior Delinquency	--	.66****	--	1.17*
Impulsivity	.64****	.75**	.84	.77
Cognitive functioning	.99**	.99*	1.00	1.00
Learning disability (no)	.64	.61	.74	.77
Early arrest (no)	.68	1.67	1.69	1.22
Maternal attachment	1.02	1.01	.96	.97
Maternal monitoring	1.01	.97	.95	.96
Perceived peer delinquency	.99	1.07	1.10	1.06
School environment	.94	.94	1.08	1.10
Environmental risk index	.93	.93	.83	.83
Neighborhood disorg. (no)	.55**	.64	.66	.57
Household poverty (no)	1.03	1.13	1.08	1.09
Model fit	Unadjusted: $\chi^2=60.68****$ ($R^2=.15$) [♦]		Adjusted: $\chi^2=97.78****$ ($R^2=.23$) [♦]	

The first columns represent the unadjusted effects; the second columns represent the effects adjusted for baseline delinquency
*p<.10, **=p<.05, ***=p<.01, ****=p<.001; [♦] R² reflects Cox and Snell Pseudo R-Square.

¹G3 (adolescent-limiteds) is reference group