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The Non-Criminal Consequences of Gang Membership:
Impacts on Education and Employment in the Life-Course

by

David Cyrus Pyrooz

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
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ABSTRACT

Research on the consequences of gang membership is limited mainly to the study of crime and victimization. This gives the narrow impression that the effects of gang membership do not cascade into other life domains. This dissertation conceptualized gang membership as a snare in the life-course that disrupts progression in conventional life domains. National Longitudinal Survey of Youth Cohort of 1997 (NLSY97) data were used to examine the effects of adolescent gang membership on the nature and patterns of educational attainment and employment over a 12-year period in the life-course. Variants of propensity score weighting were used to assess the effects of gang joining on a range of outcomes pertaining to educational attainment and employment.

The key findings in this dissertation include: (1) selection adjustments partially or fully confounded the effects of gang joining; despite this (2) gang joiners had 70 percent the odds of earning a high school diploma and 42 percent the odds of earning a 4-year college degree than matched individuals who avoided gangs; (3) at the 11-year mark, the effect of gang joining on educational attainment exceeded one-half year; (4) gang joiners made up for proximate deficits in high school graduation and college matriculation, but gaps in 4-year college degree and overall educational attainment gained throughout the study; (5) gang joiners were less likely to be employed and more likely to not participate in the labor force, and these differences accelerated toward the end of the study; (6) gang joiners spent an additional one-third of a year jobless relative to their matched counterparts; and (7) the cumulative effect of gang joining on annual

income exceeded \$14,000, which was explained by the patterning of joblessness rather than the quality of jobs. The theoretical and policy implications of these findings, as well as directions for future research, are addressed in the concluding chapter of this dissertation.

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Chapter 1

INTRODUCTION

In San Jose, CA, where the I-880 crosses U.S. Route 101, a billboard declares that “Gangs have a special place for your kids.” This statement was juxtaposed with a picture of a foggy cemetery and shadowy headstones rising from the grass. The billboard was part of an ad campaign sponsored by the Santa Clara County District Attorney’s office to combat gang activity in the region (Fernandez, 2009). This media blitz also included television and radio commercials with the following message: “*Gangs want your kids. They replace you and become [their] new family. They’ll take good care of them, watch over them, protect them (gunshot in the background), they’ll probably even attend the funeral. How thoughtful.*”¹ The message from this campaign was clear: Kids that join gangs die young. But do they? What happens to kids that join gangs? Does joining a gang equate to a lifetime crime, violence, prison, joblessness, and failed families? Despite 90 years of research, criminology is far from being able to answer this question adequately. This dissertation aims to fill this void by exploring the educational, employment, and economic trajectories of gang members as they navigate out of adolescence and into adulthood.

Gangs are both a cause and consequence of a host of social and economic problems (Curry and Decker, 2003; Egley, Maxson, Miller, and Klein, 2006; Klein and Maxson, 2006). The extent of the problem is far reaching. In 2008, there were approximately 28,100 gangs and 731,000 gang members in the U.S.,

¹ Appendix A contains a picture of the billboard downloaded from the Santa Clara County District Attorney Office’s webpage.

with roughly one out of every three law enforcement jurisdictions reporting gang problems (Egley, and Howell, 2011). In perhaps the most striking example of the problem, gangs were associated with over one out of every five homicides in the 100 largest U.S. cities between 2002 and 2006 (Pyrooz, 2012). The fear, intimidation, and violence associated with gang activity tends to be concentrated in underprivileged schools and disadvantaged neighborhoods, thereby reducing quality-of-life and restricting the movement among residents (Bursik and Grasmick, 1993; Elliot, Menard, Rankin, Elliott, and Wilson, 2006; Howell, 2006; Katz and Schnebly, 2011; Naber, May, Decker, Minor, and Wells, 2006; Rosenfeld, Bray, and Egley, 1999; Skogan, 2006; Tita and Ridgeway, 2007).

Similar themes emerge with regard to individual gang members as well. Krohn and Thornberry (2008: 138) stated that “. . . there is no dispute about the association of gang membership and high rates of criminal involvement.” This statement can be taken one step further and extended into the context of victimization, especially violent victimization (Katz, Webb, Fox, and Shaffer, 2011; Taylor, Peterson, Esbensen, and Freng, 2007). Gang membership involves defending territory, retaining status, responding to threats, and demonstrating dominance—all of which elevate the risks of offending and victimization (Decker, 1996; Felson, 2006; Katz, 1988; Klein, 1995; Short and Strodbeck, 1965). Taken together, it comes as no surprise that gang members are subject to high rates of violent victimization and untimely death. Decker and Pyrooz (2010a) estimated that gang member homicide victimization rates were as much as 100

times greater than the national average. It is within this context that we can begin to understand the message the Santa Clara County DA's office was conveying.

Adolescence can be characterized as a period of turmoil around the age youth typically join gangs (Huff, 1998; Klein and Maxson, 2006; Lerner and Galambos, 1998). The teenage years are critical in the developmental process, where advances in various life domains—education, friendship and peer relations, intimate relationships, and employment—are taking place. Importantly, youth are separating from their parents, becoming more independent, and exercising more control over their futures. The accumulation of social and human capital is instrumental to the developmental process (Coleman, 1988; Hagan, MacMillan, and Wheaton, 1996; Krohn, 1986). Disruptions in the adolescence-to-adulthood transition and deviations from age-appropriate behaviors may have negative repercussions that could delay or restrict successes in later life (Amato, 2000; Elder, 1998; Furstenberg, Brooks-Gunn, and Morgan, 1987; Huizinga and Henry, 2008; MacMillan, 2001; McCord, 1983; Sweeten, Bushway, and Paternoster, 2009). These disruptions can be thought of as “snares” (Moffitt, Caspi, Dickson, Silva, and Stanton, 1996: 404), or factors that “diminish the probability of a conventional lifestyle.” The line of research that examines such relationships—the effect of past events on later events—has been termed *life-course research* or a *life-course perspective* (Elder, 1998; Elder and Giele, 2009).

Gang membership can be characterized as a snare or adverse disruption in the developmental process. As mentioned above, the consequences of this disruption have been established firmly in the short-run. Less is known, however,

about the impact of gang membership on later life stages. In Malcolm Klein's seminal book, *Street Gangs and Street Workers* (1971: 136), he stated that "[a]lthough the need is great, there has been no truly careful study of gang members as they move on into adult status."

The state of the literature has not improved substantially despite 40 years of criminological progress, which includes individual-level analysis moving to the forefront of criminological research (Lilly, Cullen, and Ball, 2007) and the proliferation of publicly available longitudinal data sets containing measures of gang membership (Krohn and Thornberry, 2008; Liberman, 2008). Research stemming from Chicago and Rochester, NY has reported "cascading" consequences of gang membership several years into adulthood (Levitt and Venkatesh, 2001a; 2001b; Krohn, Lizotte, Thornberry, Hall, and Chu, 2011; Thornberry, Krohn, Lizotte, Smith, and Tobin, 2003). Still, questions remain. For example, how generalizable to gang members across the United States are the findings from two high-risk samples drawn from now-defunct Chicago housing projects and western New York? Also, how do the long-term consequences of gang membership evolve longitudinally over time? Are the consequences limited to specific life phases or do they become more pronounced with age? Further, to what extent do pre-existing criminal characteristics and dynamic selection factors render observed relationships spurious? In other words, is gang membership simply a reliable signal for later life problems, or does it contain causal significance? Not knowing the answers to these questions constrains our

understanding of the extent and nature of the problem. The implications from this line of questioning extend well beyond the domain of gang research.

Within this framework we can begin to identify the relevance of gangs and gang membership to life-course theory and research in criminology. In terms of criminological theory, a longstanding debate surrounds the empirical examination and interpretation of continuity in problem behaviors (Nagin and Paternoster, 1991; 2000). Central to this debate is what Sampson and Laub (2005) termed “Robins’ paradox”: retrospectively studying adult offending populations reveals that the vast majority were adolescent offenders; prospectively studying adolescent offending populations reveals that the vast majority do not become adult offenders (Robins, 1978). Two perspectives have sought to explain the stability of problem behaviors: (1) persistent heterogeneity, where latent criminal characteristics traits manifest throughout the life-course across various life domains, and (2) state dependence, where a temporal contagion process linked to current life states erodes criminal constraints and promotes problem behaviors (Nagin and Paternoster, 2000). To the extent that selection into gangs and criminal propensity is modeled, studying the long-term consequences of gang membership would shed important light on this criminological debate.

On the policy front, identifying the long-term consequences of gang membership would lend enormous credence to prevention and intervention programs targeting gang populations. Gang-related issues rank high on the agenda of policymakers and command the attention and resources of authorities. Local, state, and federal micro and macro gang programs are accompanied by large price

tags that are passed along to the taxpayer (Fearn, Decker, and Curry, 2001; Klein and Maxson, 2006). Not to mention, the costs of gang violence—community fear and disinvestment, hospitalization and rehabilitation, emergency system responders, disability insurance—are by no means modest. A long list of criminal justice responses demonstrates the difficulty of dealing effectively with gang populations and often reflects the failure of hastily-developed programs (Decker and Curry, 2002; Klein and Maxson, 2006; McGloin and Decker, 2010; Thornberry et al., 2003). Taking a step back allows one to consider gang membership across the broader spectrum of the life-course and to devise strategies and programming for this clientele.

The following chapters of this dissertation extend what is known about the consequences of gang membership. In particular, the research questions contained herein examine whether joining a gang produces negative outcomes in the domains of education and employment. These domains were chosen because they are two of the foremost social institutions that dictate economic and social stratification in the United States. Failure in the educational domain closes many doors for employment and limits upward mobility. Failure in the employment domain introduces challenges to one's quality-of-life and the ability to exercise control over one's future. Understanding factors that inhibit development and progress in education and employment should be on the radar of those concerned with the well-being of youth and young adults in this country. To date, we know very little about the transition to adulthood among individuals who join gangs (Klein, 1971; Levitt and Venkatesh, 2001; Krohn et al., 2011).

The National Longitudinal Survey of Youth 1997 (herein, NLSY97), coordinated by the Bureau of Labor Statistics, is used to answer a series of research questions about the long-term consequences of gang membership. The NLSY is a nationally representative, longitudinal source of information on approximately 9,000 teenagers surveyed annually over 13 waves—between 1997 and 2009. These data contain a wealth of information on the educational, employment, criminal, familial, health, and psychological history of the sample during the study period. Importantly, by virtue of survey items related to gang membership, the NLSY contains one of the largest subsamples of self-reported gang members examined over time. Various counterfactual approaches are used to model selection while examining whether joining a gang has negative effects on educational attainment and employment in emerging adulthood.

The roadmap of this dissertation is as follows: Chapter 2 provides the theoretical foundation to study the evolving consequences of gang membership in non-criminal domains, and frames the problem in the context of a life-course criminology framework. Chapter 3 contains a review of the relevant literature, beginning with a review of the sources of knowledge on gang research to discuss why so little is known about the issues at hand. This is followed by reviewing the qualitative studies that describe the adult lives of adolescent gang joiners, and then the quantitative studies that examine the effects of gang membership. The quantitative studies are particularly important, as they place us in the best position to pose the questions asked in this dissertation. Chapter 4 outlines the methods—data, measures, and analytic strategies—used to assess the impact of gang

membership on educational and employment outcomes. Chapter 5 contains analyses that explore whether gang joining has a negative effect on educational attainment in the life-course. Chapter 6 contains analyses that explore whether gang joining has a negative effect on employment in the life-course. Chapter 7 discusses the implications of the findings from chapters 6 and 7, and outlines directions for future research.

Chapter 2

THEORETICAL FOUNDATION

A growing movement across the social sciences has been to study continuity and change in human behavior across various life phases. This movement has been termed life-course research or uses a life-course framework (Elder and Giele, 2009; Settersten, 2009).² This framework is transferable across diverse areas of research—e.g., education, psychology, sociology, social work, and public health—which makes life-course studies appealing to scholars of all persuasions. The establishment of the peer-review journal *Advances in Life Course Research*, which was previously an annual book series, demonstrates the growth in this area of research. Billari (2009) examined the ISI Web of Science interdisciplinary database to assess the growing state of life-course research. Using “life course” as a keyword in publications from 1990 to 2010, a strong, positive linear slope is observed for life-course related publications, increasing from fewer than 50 hits in 1990 to nearly 600 hits in 2010. Life-course research is especially prominent in the field of criminology, which ranked 8th out of the 54 subject areas in Billari’s study,³ accounting for five percent (or 231) of the 4,528 life-course publications.

Life-course theory and research holds a central place at the heart of the discipline of criminology. Classic life history studies resemble the spirit of

² In psychology, this movement is typically referred to as “life span” or “developmental” research, while “life course” has its roots in sociology. The use of life course appears most commonly outside of the psychology discipline.

³ Billari (2009: 84) noted that for a subject area to be included in the list, at least 20 publications in that area must include “life course” as a keyword.

contemporary life-course criminology (e.g., Anderson, 1923; Shaw, 1930; Sutherland, 1937). The contemporary life-course orientation was born at a time period replete with contentious debates on topics such as the age-crime curve, criminal careers, and the generality of theory (Akers, 1991; Blumstein, Cohen, and Farrington, 1988; Gottfredson and Hirschi, 1983; 1986; Wolfgang, Figlio, and Sellin, 1987). Viewing crime over the life-course provided a refreshing challenge to the status of theories. In effect, theorists and researchers could no longer focus solely on childhood (as attributed to psychologists) or adolescence (as attributed to sociologists) for understanding crime and delinquency (Sampson and Laub, 1992). A life-course framework required criminologists to attend to what has become known as the life-course or “criminal career” parameters of offending: onset, continuity, and desistance. Some scholars dismissed the challenge (Gottfredson and Hirschi, 1990; Hirschi and Gottfredson, 1995), some embraced the challenge (Akers, 2009; Warr, 1998), and others spearheaded the movement forward (Moffitt, 1993; Sampson and Laub, 1993). The movement to study criminal behavior over the life-course is responsible for opening many windows—both theoretical and methodological—in the field of criminology. Indeed, Cullen (2011: 310, *emphasis added*) stated in his 2010 Sutherland Address to the American Society Criminology that the field needs to accept the fact that “*Life-course criminology (LCC) now is criminology.*”

THE LIFE-COURSE PERSPECTIVE IN CRIMINOLOGY

A life-course framework crosses units of explanation and emphasizes the temporal nature of scientific phenomena, making this approach multidisciplinary and comprehensive (Elder and Giele, 2009). Organizing this framework are four complementary components (Elder, 1994; 1998; Elder and Giele, 2009): (1) *historical and geographical context*: Lives are embedded in and shaped by historical time periods and places experienced, where cohorts of one era differ from the next era (Ryder, 1965); (2) *social embeddedness*: People operate in evolving “social convoys” containing overlapping networks of family, peers, coworkers, and acquaintances (Kahn and Antonucci, 1980; Moen and Hernandez, 2009); (3) *human agency*: Individuals construct their lives via situationally-conditioned choices and actions (Bottoms, 2006; Giordano, Cernkovich, and Rudolph, 2002); and (4) *timing*: The placement of events along the developmental life path differentially impacts future events (see Liberman, 2008). The latter component, *timing*, has been the focus of considerable research, as scholars have sought to identify events associated with alterations to the life-course.

The unfolding of the life-course framework has not occurred without controversy, however. A particularly contentious exchange transpired in the 49th volume of *American Sociological Review* in 1984. Apparently discontent with the treatment of “social forces” in developmental psychology, Dannefer (1984) provided an extensive critique of the ontogenetic portrayal of human development. Specifically, Dannefer argued that age was inappropriately used as an “omnibus variable” (104), and thus by asserting a normative developmental

process in which straying from that process was nonnormative, the approach was ultimately unfalsifiable. In turn, Dannefer posited a sociogenic approach to human development. Baltes and Nesselrode (1984), key targets of Dannefer's critique, responded by holding that life span development was a heuristic device, not a theory, and that the three influences on human development—age-graded influences, history/time-graded influences, and influences outside of age, history, and time (i.e., non-normative)—do not discount social forces. In the end, the debate appeared to center around semantics and the usage of “normative,” as sociologists conceptualized normative in terms of invariance while psychologists conceptualized normative in terms of “typical” or “common.” This exchange is a testament to the interdisciplinary sensitivity surrounding individual and social explanations of human behavior over the life-course.

A parallel line of controversy is found in the field of criminology, where a debate surrounds the interpretation of continuity in problem behaviors (Nagin and Paternoster, 1991; Sampson and Laub, 1992). To be sure, one of the strongest correlations in criminology is the positive association between adolescent and adult offending. What has become known as Robins' paradox is one of few criminological “facts” (Robins, 1978; Sampson and Laub, 2005)—retrospectively studying adult offending populations reveals that the vast majority were adolescent offenders; prospectively studying adolescent offending populations reveals that the vast majority do not become adult offenders. This debate centers on exactly *what* explains continuity in criminal offending, with the intent of decomposing the findings along sociological and psychological disciplinary battle

lines. Nagin and Paternoster (1991; 2000; see also Piquero, Farrington, and Blumstein, 2003) identified two classes of theoretical perspectives—persistent (population) heterogeneity and state dependence—on the continuity of problem behavior.

According to proponents of persistent heterogeneity, continuity in offending is driven by unchanging antisocial characteristic(s) or trait(s). Theories emphasizing characteristics such as low self-control, neuropsychological deficits, intelligence, impulsivity, or other constitutional factors are consistent with the persistent heterogeneity perspective (Caspi, Moffitt, et al., 1994; Gottfredson and Hirschi, 1990; Moffitt, 1993; Wilson and Herrnstein, 1985). These characteristics are posited as being relatively fixed over the life-course after childhood and vary across the population. As such, the continuity of criminal behavior is explained by such immutable traits (Gottfredson and Hirschi, 1990; Wilson and Herrnstein, 1985). Central to this theoretical perspective, and the key source of controversy, Nagin and Paternoster (2000: 117) stated that “[a]ny observed correlation between these later life events and criminality, therefore, is spurious rather than causal, due to the fact that they are all the effects of a common cause.” Thus, criminal characteristic(s) will reverberate throughout the life-course and across a variety of life domains. Those with poor self-control, for example, will have less stable employment histories and less successful marriages because they are impulsive, self-centered, and tend to mortgage their future.

According to proponents of state dependence, on the other hand, continuity in offending is driven by a temporal contagion process. Specifically,

states, events, and actions occurring over the life-course hold causal significance. Onset, persistence in, and desistance from criminal and delinquent offending can be explained by malleable circumstances. Thus, previous criminal behavior itself exhibits a causal effect on present criminal behavior because of the constraints and opportunities such prior behavior produces. Theories emphasizing criminal justice sanctions, deviant labels, criminal and delinquent networks, or other life states are consistent with state dependence (Agnew, 1992; Akers, 2009; Becker, 1963; Lemert, 1972; Sampson and Laub, 1997). Contrary to the static approaches of persistent heterogeneity, state dependence theories emphasize a dynamic approach and appreciate life events and states—such as gang joining and gang membership—as cause rather than consequence.

Theorists such as Moffitt (1993) argued that both processes are taking place. In her taxonomy theory, she held that life-course persistent offenders fit within a persistent heterogeneity perspective (by virtue of neuropsychological deficits) and that adolescent-limited offenders fit within a state dependent perspective (by virtue of the maturity gap in social/biological age). Sampson and Laub (1993; 1997) presented an argument along these lines, but in the form of a general theory. Their concept of cumulative continuity elaborated their age-graded theory of information social control to include labeling and other sociogenic factors. Quoting Clausen (1993: 521), Sampson and Laub noted that “early advantages become cumulative advantages; early behaviors that are self-defeating lead to cumulative disadvantages.” Constitutional factors may indeed lead to the selection into poor life states; however, environmental conditions and

responses act beyond a mere stage where pre-determined events are acted out. To be sure, formal and informal sanctions of such decisions and activities hamper future individual advancements (i.e., labeling theory). Sampson and Laub stated (1997: 155, emphasis added):

To assume that individual differences influence the choices one makes in life (which they certainly do) *does not mean that social mechanisms emerging from those choices can then have no causal significance.* Choices generate constraints *and* opportunities that themselves have effects not solely attributable to individuals. As situational theorists have long pointed out, the same person—with the same attributes and traits—acts very different in different situations.

In other words, it is inappropriate to discount the relevance of events or states for explaining later outcomes. For example, youth with poor self-control may coalesce into delinquent groups such as gangs, but the gang itself then exerts an influence—via various gang processes and mechanisms—on delinquent behavior beyond mere criminal propensity. The problem, however, rests with disentangling the causal significance of states (e.g., gang membership) on later events (e.g., delinquent acts), or vice-versa, from criminal propensity, as it introduces a host of conceptual and methodological issues. Key concepts in the life-course paradigm assist in better understanding these issues.

KEY LIFE-COURSE CONCEPTS AND GANG MEMBERSHIP

Principal to a life-course framework are what Elder (1985) identified as trajectories, transitions, and turning points. These concepts are captured mostly in the life-course components of *social embeddedness* and *timing*, and refer to the life-course in terms of a “traveled” path. They are best understood collectively, as

each one has implications for the others. In conceiving the life-course as the “interweav[ing] of age-graded trajectories,” Elder (1994: 5) placed trajectories at the forefront of the life-course paradigm. Trajectories are seemingly stable pathways, often referencing social institutions, such as work or family, or other cognitive, behavioral, or relational components, which can be characterized by some degree of persistence (see Wheaton and Gotlib, 1997). Trajectories overlap with one another, and it is this overlap, in combination with transitions and turning points, that aid in understanding the life-course. In criminology, it is common to identify causes, correlates, and consequences of criminal trajectories (Blokland, Nagin, and Nieuwbeerta, 2005; Odgers, Moffitt, et al., 2008; Piquero, Farrington, Nagin and Moffitt, 2010). It is in this context that “crime” can be conceived of as a state as opposed to an event.

Transitions are events that occur over brief time periods. These events take place in the context of trajectories. Transitions define trajectories, giving them “distinctive form and meaning” (Elder, 1994: 5). Using crime as an example, the criminal trajectory is comprised of offending events. Some significant events bring meaning to that criminal trajectory, allowing one to point out retrospectively specific events as characterizing his or her criminal trajectory (Katz, 1988; Wright and Decker, 1997). Similarly, turning points are events. What distinguishes turning point events from transition events is that the occurrence of the former realigns or disrupts an existing trajectory (Abbott, 2001; Laub and Sampson, 1993). *But for* the occurrence of the event, individual life circumstances would not have changed in such significant ways. Instead of simply constituting a

“meaningful” or trajectory “defining” event, a turning point instead redirects the life-course on an alternative path. For example, motherhood and violent victimization have been characterized as life changing events associated with desisting from deviant behavior (see, e.g., Jacques and Wright, 2008; Kreager, Matsueda, and Erosheva, 2010). The immediate impact of a turning point event is left to speculation, however, as turning points can only be recognized retrospectively over longer time periods (Laub, Sampson, and Sweeten, 2008). Identifying such monumental events is a mainstay in life-course criminological research, as they are viewed as a point of intervention (see Decker and Lauritsen, 2002). For this reason, scholars have readily examined the effect of employment, incarceration, marriage, military service, and parenthood on desistance from crime and whether they hold turning point significance (see Laub and Sampson, 2001, for a review).

These life-course concepts—trajectories, transitions, turning points—are especially salient during childhood and adolescent years because they foreshadow movement into adulthood. If the life-course is conceived as an interweaving of successive trajectories and transitions, there is a general developmental path that people tend to follow. For example, people enter educational trajectories in their formative years and then tend to move into employment and familial trajectories as they age. Disruptions in such processes may result in divergences from the modal or age-appropriate developmental path.⁴ Disruptions that occur at earlier life stages, especially social and economic disadvantages, can snowball and

⁴ In light the Dannefer/Baltes and Nesselroade debate, a soft version of normative is used as a heuristic device for emphasizing the importance of life course disruptions.

accumulate into larger setbacks and difficulties at later life stages. Childhood and adolescence are especially important periods for developing life skills and attaining human and social capital. Indeed, the transition from childhood to adolescence and adolescence to adulthood are critical stages in the developmental process (Marini, 1984; Shanahan, 2000). Disruptions in the transitional process during these formative years can have repercussions throughout the life-course (Amato, 2000; McCord, 1983). For this reason, researchers examine key events during adolescence, such as child abuse and divorce, to determine whether they maintain turning point significance at later stages in the life-course.

One area of adolescence that has received considerable attention from researchers and policymakers is gang membership. A *gang* is any “durable, street-oriented youth group whose involvement in illegal activity is part of its group identity” (Klein and Maxson, 2006: 4). Gangs are no longer confined to inner-city domains, as gang activity has been documented in suburban and even rural areas throughout the United States (Egley and Howell, 2011). While the prevalence of gang membership among youth varies according to region and sample type (Klein and Maxson, 2006), youth report involvement in gangs at non-trivial rates. For example, a sample of 8th graders in 11 cities spread throughout the U.S. revealed a prevalence rate of 17 percent (Esbensen et al., 2001)⁵—one out of every six youth reported gang involvement at a point in time. The onset of this trajectory peaks in early adolescence, around 12-13 years in age, and typically lasts fewer than three

⁵ The eleven cities were: Kansas City, MO, Las Cruces, NM, Milwaukee, WI, Omaha, NE, Orlando, FL, Philadelphia, PA, Phoenix, AZ, Pocatello, ID, Providence, RI, Torrance, CA, and Will County, IL.

years (Huff, 1998; Klein and Maxson, 2006; Krohn and Thornberry, 2008). Thornberry and colleagues (2003) conceived gang membership as a trajectory because some youth enter gangs while other youth do not. Entry into the state has been conceived as a turning point in the life-course, redirecting life trajectories in significant and negative ways (Melde and Esbensen, 2011; Thornberry et al., 2003). This dissertation argues that joining a gang acts a “snare,” disrupting adolescent development in ways that are described in the following section.

Not all scholars share the opinion that gang membership “matters” in the life-course; nor do all scholars share the opinion that gangs are “real.” Sullivan (2005) and others (e.g., Hallsworth and Young, 2008; Katz and Jackson-Jacobs, 2004; Kennedy, 2009) contend that studying gangs obscures the larger problem of youth violence. Gottfredson and Hirschi (1990), alternatively, held that delinquent peers naturally coalesce in urban environments as a function of poor self-control and inadequate supervision (i.e., selection), and only acknowledged such gangs to the extent that they are an act analogous to crime. Further, Gottfredson and Hirschi argued anything beyond their interpretation derived “more from politics and romance than the results of research (1990: 206).⁶ The former set scholars argued against the study of gangs on policy grounds, in that studying violent acts is more important than studying groups involved in violent acts. The latter set scholars argued against the study of gangs on conceptual grounds, in that offending is reducible entirely to the absence of control and that selection, not groups, is the source of criminal behavior.

⁶ Kissner and Pyrooz (2009) argued that gang membership was a state, not an “act analogous to crime,” by virtue of collective behaviors, group identity, and mutual trust.

Moving outside of these debates and into the framework of life-course criminology redirects the focus of the question: Does entering a gang negatively impact developmental and life-course trajectories? By letting youth self-nominate their involvement in gangs—which has been shown to be a robust indicator of gang membership (Esbensen et al., 2001; Thornberry et al., 2003)⁷—it avoids issues of reification and conceptual messiness. By boiling gang membership down to a yes/no question, it side-steps the above debates while allowing the answers to have large implications for theory and policy. Based on popular knowledge, which portrays sensationalized gang violence (e.g., the billboard in San Jose, CA; see also Esbensen and Tusinski, 2007; Howell, 2012), we would expect that joining a gang is a ticket to prison or a fast-track to untimely death. Based on quantitative gang research (Krohn and Thornberry, 2008), we would expect that the consequences of gang membership are proximate and recede upon disengagement (at least for criminal offending). Based on state dependence theories, we would expect that the consequences of joining a gang snowball into larger disadvantages. Based on population heterogeneity theories, gang membership lacks substantive significance because it is merely one of many consequences of some latent constitutional deficit.

The problem, however, is that the theoretical and empirical basis for understanding these questions is slim. Most theoretical attention directed towards gangs has focused on group-level emergence and the black box of gang processes.

⁷ While gang-related data have been questioned on a variety of levels, studies on the reliability and validity of such data have met important measurements at both micro and macro units of analysis (Esbensen et al., 2001; Pyrooz and Decker, 2010b; Thornberry et al., 2003; Winfree et al., 1992

Most longitudinal empirical attention to this issue has focused on the immediate correlates of gang membership—e.g., risk factors, offending and victimization—rather than distant (and not so distant) consequences. This means that researchers are unable to gauge the substantive significance of gang membership in the grand scheme of the life-course. Is gang membership a precarious snare in the life-course leading toward later life failures? Or, does leaving the gang signify the termination of pernicious gang influences and allow individuals to recoup their losses? Before these issues can be addressed, it is necessary to explicate the mechanisms by which gang membership maintains lasting significance over the life-course.

HOW GANG MEMBERSHIP IMPACTS LATER LIFE STAGES

Things change when adolescents join gangs. The expectations, roles, identity, and behaviors of current gang members will be different from when they were future gang members (i.e., prior to joining a gang). For this reason, it is possible to think about gang membership in terms of a (really negative) treatment, borrowing from the logic of experimental research design. In the treatment context, the Blueprints criteria (www.colorado.edu/CSPV/blueprints.com) specify that in addition to randomization and replication, a program needs to demonstrate *lasting* significance to be considered “promising.” As mentioned previously, the short-term consequences of gang membership are well-documented. Yet, there are several reasons why one would expect that the consequences of gang membership will continue years after joining a gang, regardless if one has disengaged entirely

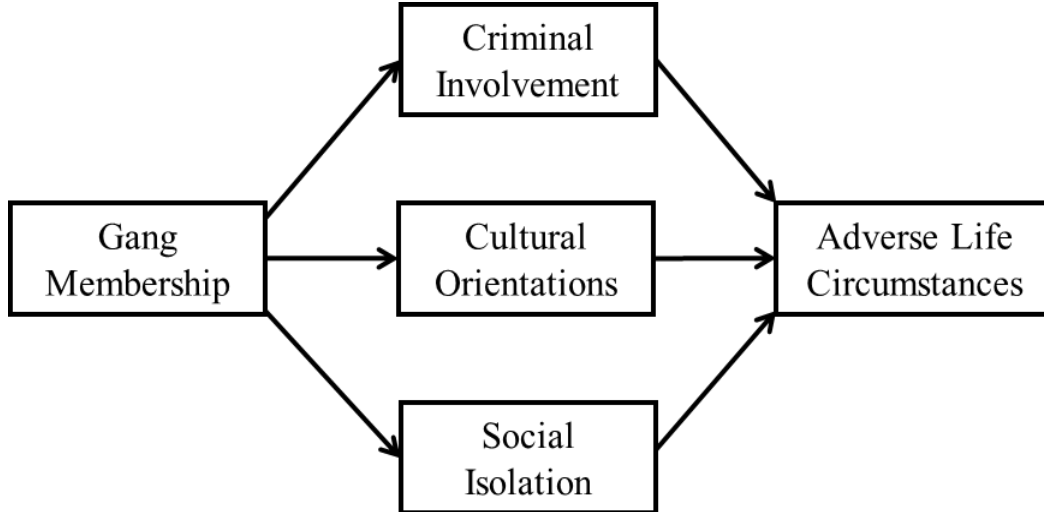
from the gang. There are three factors endogenous to gang membership—*criminal involvement, cultural orientations, and social isolation*—that explain why entrance into this trajectory can be conceived as a snare in the life-course. To the extent that gang membership sets off these mechanisms, there is good reason to believe that the consequences of gang membership will extend years beyond initial gang joining. Figure 1 outlines the direction of these specified hypotheses.

First, gang membership exerts a *criminogenic* influence on individuals. That is, when adolescents join gangs, they are more likely to engage in delinquent offending and more likely to be victimized (Krohn and Thornberry, 2008). This influence is identified most clearly in the context of violent offending and violent victimization. The most tangible consequence of the criminogenic influence of gangs is that law-violating acts could lead to incarceration. Should those acts be violent in nature or occur in a municipality that contains gang enhancement penalties,⁸ perpetrators are likely to spend extended periods of time in correctional facilities or under supervision. Additionally, the growth of gang databases and the exchange of information across all stages of the criminal justice system means that the gang label will “stick” with an individual (Katz, 2001; Katz and Webb, 2006; Pyrooz, Wolfe, and Spohn, 2011; Toch, 2007).

Formal social control may be the most visible consequence of offending linked to gang membership, but there are other tangible and less tangible

⁸ Gang enhancements are additional penalties associated with crimes that are determined to be gang-related. California’s STEP Act—Street Terrorism Enforcement and Prevention Act—was among the first to specifically target gang members and tack on addition penalty enhancements to sentences, some of which include as much as 10 additional years in prison for the commission of a gang-related offense (Baker, 2006).

Figure 1.1. Mechanisms linking gang joining to adverse adult life circumstances



consequences as well. Gang labeling could have lasting effects on the life-course, especially when coupled with tattoos. In interviews conducted with current and former gang members, the penalties associated with tattoos—in the form of negative police and employer treatment—were well-known by gang members. A former gang member in Fresno, CA stated, “I’m always going to be treated like a gang member because I’m a walking billboard.” A former gang member in Phoenix, AZ described the following interaction with the police:

I was walking down the street one time and these boys got pulled over. And I guess the cops thought I was with them, so they pulled me over too. And then they started like questioning me about my tattoos and all that. And then they started taking pictures and like, like they uh, as soon as they put up... put my name in the computer, something, I guess like gang tats had pulled up, and they’re like ‘Oh, well, you’re affiliated,’ and they started tryin to make me throw my gang signs, and I was just like ‘No, I’m not doin that.’

Even for individuals no longer affiliated with the group, tattoos and other institutionalized gang identifiers are constant reminders of gang life.

Violent victimization is among the most serious risks associated with gang membership. For example, based on one wave of GREAT data,⁹ Peterson et al. (2004) reported that self-nominated gang youth, when compared to non-gang youth, had a greater likelihood of being a victim of assault (66 percent to 48 percent), robbery (25 percent to 7 percent), and aggravated assault (43 percent to 9 percent). Survey research, however, tends to obscure the nature and extent of these events. Ethnographic research provides a thick description of violent gang events, where the social context in which shootings and stabbings occur are provided in works such as Decker and Van Winkle (1996), Fleisher (2000), and Vigil (1988). For example, Decker and Van Winkle reported:

The field ethnographer witnessed several drive-by shootings while on the way to pick up interview subjects, and on one occasion, he saw three of our subjects shot while waiting to be picked up for an interview (1996: 46)

One St. Louis gang member described a violent event as follows:

They was fighting and he pulled a gun out so I stabbed him in the back. I thought he was going to shoot my brother, which he was so, I stabbed him in the back. He paralyzed now. (1996: 180).

These types of victimization events take on added significance when considering their lasting impact on psychological wellbeing, permanent injury, and even untimely death. It is no surprise that the violent social context of gang membership contains psychological consequences, which is why there is a link between gang membership, exposure to violence, and post-traumatic stress disorder (Wood, Foy, Layne, Pynoos, and James, 2002). In addition, injuries sustained from violent events may have permanent costs, such as physical

⁹ GREAT stands for Gang Resistance Education and Training and consists of a sample of over 3,500 youth surveyed over a 5-year period.

incapacitation (e.g., Juetten and Berger, 2008), which introduces a host of restrictions and difficulties. Finally, in the decade following the research, 28 of the 99 gang members in Decker and Van Winkle's study in St. Louis, 5 of the 38 gang members in Levitt and Venkatesh's (2001a) study in Chicago, and 3 of the 37 gang members in Hagedorn's (1991) study in Milwaukee died violently.

Second, the *cultural orientation* of gangs is replete with codes of conduct that are generally inconsistent with conventional institutions. Specifically, gangs exert an influence on, and (re)define, the norms and values of their members. Classic subcultural statements reported that the focal concerns of "corner groups," much like conventional groups, value status and respect; however, the way in which respect and status are secured in the former are at odds with the latter (Cloward and Ohlin, 1960, Cohen, 1955, Miller, 1958; Whyte, 1943). Contemporary statements on the "code of the street" in inner city America illustrate these concerns. Street codes refer to a "set of informal rules governing interpersonal public behavior" (Anderson, 1999: 33). These codes dictate appropriate responses to various phenomena. Anderson's codes of the street are magnified and extended in the gang context because the group-based nature of activities, customs, and expectations are associated with status attribution and belonging (Miller, 1958; 2011). It is necessary for gang members to be well-versed in these codes, as the lack of awareness could result in victimization as described above (see, e.g., Felson, 2006; Katz, 1988; Matsueda, Drakulich, and Kubrin, 2006; Melde, Taylor, and Esbensen, 2009; Stewart and Simons, 2010).

In pro-social or conventional peer groups, traditional goals and aspiration include gaining acceptance into a four-year university or attaining a perfect grade point average. Success—in the form of status and respect—in the gang context is avoiding active snitching, displaying physical prowess, public retaliation, or accumulating money through drug-dealing activities (Decker and Van Winkle, 1996; Rosenfeld, Jacobs, and Wright, 2003; Short and Strodbeck, 1965). Emerging empirical evidence (Melde and Esbensen, 2011) indicates that joining a gang exerts an immediate harmful effect on the attitudes, emotions, and routine activities of gang members—this influence partially mediates the global effect of gang membership on delinquency (see also Thrasher, 1927: 390-394). The cultural orientations of gangs can have long-term negative impacts on gang members (1) if individuals are unable to “shake the codes” over time despite having desisted from the gang, or (2) if individuals do not learn when it is appropriate to “code-switch” and mesh with conventional institutions. In sum, the cultural orientations of gangs that are at odds with the larger culture may have spillover effects across a range of life domains.

Third, gangs *socially isolate* their constituent members from conventional institutions. Thrasher (1927) notably referred to gangs emerging in the “interstices” of the urban environment. The contemporary version of the interstitial group, as detailed by Vigil (1998; 2002), is captured in the concept of multiple marginality—where gang members experience marginalization in

various institutional domains.¹⁰ The problem, however, is that while the gang can provide a natural recourse to attain status, identity, and companionship, it does so in a manner that isolates gang members from conventional socialization and the training that is necessary for success in contemporary adulthood. For this reason, Thornberry and colleagues (2003: 166) referred to gangs as “prototypical deviant social networks whose actors are embedded in a culture and behavior system that . . . isolates the individual from prosocial networks.”

Drawing from Coleman (1988), Hagan (1993), and McCarthy and Hagan (1995), gang members might be obtaining social and personal capital (i.e., relational and material)—or street and criminal capital—that makes them popular and respected in adolescence, but they are not accumulating the type of social and human capital (i.e., institutional linkages and skills and knowledge) necessary to transition successfully into early adulthood. As such, gang members are not overly concerned with extending network ties, acquiring legitimate employment experience, and achieving strong academic scores—all of which are central to accumulating a track record conducive to successful employment in adulthood (Decker and Van Winkle, 1996; Granovetter, 1973; Hagan, 1993; Short and Strodbeck, 1965; Sullivan, 1989). Further, the absence of acquaintances or weak ties restricts the flow of information and ideas. Decker and Van Winkle (1996: 187-191) reported that involvement in social institutions reduced substantially upon gang joining, with interpersonal relations among gang peers as the main

¹⁰ Vigil’s concept of multiple marginality was intended to provide a framework that could extend previous “one-dimensional” perspectives on gangs and cross units of explanation. It is referred to in this context as a means for how gangs and gang members are viewed in relation to conventional society.

replacement. Juxtaposing the gang context with Wilson's (1987) urban economic perspective of the underclass, gang members are likely to be undereducated and thus unemployable in the contemporary marketplace and thus relegated to the illicit economy or entry-level service economy (see also, Hagedorn, 1998). To the extent that gang members are socially isolated from conventional capital, this should correspond with long-term consequences at later life stages (Pyrooz, Sweeten, and Piquero, 2012).

Taken together—regardless if someone has left his or her gang—the “mark” of a criminal gang member, a hypersensitivity to disrespect, and a limited social network fuse together to have lasting consequences on the life-course. To the extent that gang members are exposed to the pernicious effects described above, the institutions of education and employment will likely be impacted. Disruptions in educational trajectories may delay or restrict the achievement of milestones such as graduating high school or completing a 4-year college degree with one's age cohort. In turn, inadequate education will likely impact employment trajectories, resulting in unstable employment and “close doors” to more attractive positions. Similarly, the cultural orientations of gangs may place one at odds with fellow employees or employers, especially with regard to issues of respect. Perhaps even more importantly, limited or dense peer and social networks may lead to restricted access to information, such as new job openings, as Granovetter's (1983) thesis proposes. In summary, the small bundle of disadvantages that have transpired as a result of joining a gang may accumulate

into larger disadvantages at later life stages. For these reasons, we can expect that gang membership could have consequences that extend into adulthood.

The following chapter reviews what is known about the adult lives of adolescent gang members. Several qualitative and quantitative studies have examined this topic, but only the latter set of research is able to speak to the consequences of joining a gang. Before examining this literature, the next chapter begins by discussing the epistemology of gang research and several factors that explain why we know so little about the long-term consequences of gang membership.

Chapter 3

CONSEQUENCES OF GANG MEMBERSHIP

Gangs have been a central object of examination in the social sciences—especially criminology—since the 1920s. Theoretical statements at the heart of sociological criminology, particularly from Cloward and Ohlin (1960), Cohen (1955), Miller (1958), Shaw and McKay (1942), Short and Strodtbeck (1965), and Thrasher (1927), were rooted in the context of gangs and group-based offending (see Bursik and Grasmick, 1993: 112; Kreager, Rulison, and Moody, 2011; McGloin, 2007a). Indeed, to this day, these theories remain among the most commonly cited in contemporary criminology. Over the course of the last nine decades, however, the epistemology of gangs has changed. The criminological attention afforded to gangs also has waxed and waned. Three decades ago Bookin-Weiner and Horowitz (1983) asked if ideological and economic shifts the 1980s marked the end of the “youth gang fad.” Even recently, scholars have questioned the study of gangs and whether gang research has outgrown the growth of gangs themselves (Sullivan, 2005).

Contemporary criminology does not afford the same prominence to gangs, especially in terms of theory, since gangs are often viewed as “extreme” delinquent peer groups (see Short, 2006; see also McGloin, 2007b; Warr, 2002). Nevertheless, gangs remain relevant to contemporary mainstream criminology and provide ideal opportunities to test and extend the understanding of criminological theory in the gang context and understand criminal justice system responses to gangs in communities (Short, 2006). Indeed, gangs remain a very

active topic of research, and criminology remains the disciplinary “home” for studying gangs.¹¹

That said, there have been various changes in the discipline of criminology that can be linked to the contemporary standing of gang research. Changes include the growth of criminology as an independent discipline, the unmooring of criminology from sociology’s focus on adolescent deviance, the continued definitional ambiguity surrounding gangs, and, perhaps most importantly, the sources of knowledge on gangs have changed (Akers, 1992; Ball and Curry 1995; Esbensen et al., 2001; Sampson and Laub, 1992). The result of these structural changes in the discipline has had an effect on how knowledge about gangs is produced, which has both direct and indirect implications for understanding the topic of this dissertation—the evolving consequences of gang membership in non-criminal domains.

SOURCES OF KNOWLEDGE

Classic criminological theory and research on gangs—i.e., prior to 1970—was qualitative in nature. This is no longer the case. Paradigmatic shifts in the

¹¹ ISI Web of Science was reviewed (March, 2012) for gang-related manuscripts published in seven key criminology and criminal justice peer-reviewed journal outlets—*Criminology*, *Journal of Research in Crime and Delinquency*, *Journal of Quantitative Criminology*, *Justice Quarterly*, *Crime and Delinquency*, *Criminal Justice and Behavior*, and *Journal of Criminal Justice*—between 2000 and 2012. A total of 77 articles were identified with “gang” in the abstract and/or as a keyword. Articles were not distributed evenly across the journals, as *JQC* and *CJ&B* ($N=3$) and *JQ* and *JCJ* ($N=20$) were the lower and upper bounds, respectively. Edited volumes have also been instrumental in disseminating gang research. Since 2000, at least six edited volumes published have generated considerable attention in the research community, including Decker and Weerman (2005) *European street gangs and troublesome youth groups*; Esbensen and Maxson (2012) *Youth gangs in international perspective*; Huff (2002) *Gangs in America III*; Klein et al. (2001) *The Eurogang paradox*; Short and Hughes (2006) *Studying youth gangs*; and Van Gemert, Peterson, and Lien (2008) *Street gangs, migration, and ethnicity*, which have collectively produced 102 chapters of gang oriented research.

way research was undertaken in criminology began in the 1970s (Lilly, Cullen, and Ball, 2007). Quantitative survey methodology and longitudinal research design eventually permeated into the arena of gang research in the 1990s (Esbensen and Huizinga, 1993; Thornberry et al., 1993). This movement has had a threefold effect on the body of gang literature.

First, it is now far more common for published gang works to be quantitative as opposed to qualitative. Over the past decade, roughly 80 percent of gang-related articles published in peer-review journals are quantitative. This may reflect a larger pattern occurring in criminology in general, especially since the prevalence of quantitative gang-related articles drops considerably when reviewing edited volumes. For example, a host of qualitative projects can be found in edited volumes, especially ethnographic projects carried out in European settings and settings outside the United States (Decker and Pyrooz, 2012). Nonetheless, the movement to study gangs quantitatively and to have that work published disproportionately in peer-review journal outlets has consequences. The most serious consequence is that quantitative articles are the most visible to the field and most accessible via search engines, thus having the potential to steer criminological knowledge about gangs. This leads to the next point.

Second, as Hughes (2006) argued, “variables-based” quantitative approaches to studying gangs contain contextual costs, as they cannot shed light on the social context in which gang behaviors manifest. For example, Papachristos (2009: 75) stated that “Gang members do not kill because they are poor, black, or young or live in a socially disadvantaged neighborhood. They kill

because they live in a structured set of social relationships in which violence works its way through a series of connected individuals.” Thus, in quantitative studies, “gang” becomes an explanatory variable that accounts for numerous theoretical factors. The goal of predictive research, therefore, is to identify classes or typologies of choice-sets and choice-makers that help explain variation in an outcome (Gottfredson, 2005). Quantitative studies are unable to provide the rich, detailed descriptions of events and behaviors like qualitative studies. In the absence of experimental design, without being able to speak to the context in which behavior manifests, the casual significance of specific variables of interest is confounded by unobservable factors and error. This critique has been levied against quantitative social science research as a whole (Abbott, 2001).

Third, and most relevant to this dissertation, is that quantitative resources have been applied overwhelmingly to two areas of gang research: (1) risk factors of gang membership and (2) the effect of gang membership on offending and victimization. With regard to the former, risk factors are variables that distinguish gang joining from gang abstaining youth. The logic follows that programming can be crafted to target characteristics associated with gang membership; thus, this line of research holds considerable relevance in policy circles (Howell and Egley, 2005; Klein and Maxson, 2006; Thornberry et al., 2003). With regard to the latter, most empirical investigations into the effect of gang membership on offending/victimization sought to test Thornberry and colleagues’ (1993) theoretical models—selection, facilitation, and enhancement—and typically do so among teenage samples over a one to three year time-span. These models are

theoretical spinoffs from the larger propensity/socialization debates that have been applied to the gang/peer group context. This body of research provides a strong empirical understanding of two *immediate* correlates of gang membership, both of which have been driven by larger theoretical and policy forces.

The most serious drawback in the selective application of quantitative methodology is that the field has been deprived of knowledge in other areas. To be sure, we know far more about life *before* the gang and life *in* the gang than life *after* the gang (Pyrooz, Decker, and Webb, 2010). There is an inverse relationship between the number of studies on gangs and the length in years from the age of gang joining. In other words, as current and/or former gang members get older they are less likely to be the focus of research. This is problematic for theory—including life-course criminology—and policy in general and for gang research in particular. For gang research, this inattention means that scientific evidence is not allowed to influence popular discourse, leaving researchers unable to answer the question: What happens to gang members years after joining gangs? For policy and programming, it is unknown whether interventions are effective over longer time periods. For life-course criminology, this inattention to gang membership leaves a gaping absence of knowledge with regard to the long-term consequences of what can be characterized as a profound life trajectory that is entered by a nontrivial portion of American youth. This line of research could shed tremendous light on the persistent heterogeneity/state dependence debate if viewed from a life-course perspective, and speaks to larger issues surrounding the significance of life states for theory and policy.

THE ENDURING CONSEQUENCES OF GANG MEMBERSHIP

“[W]hat happens after adolescence when gang members grow up?”—a question posed by Joan Moore (1991) over 20 years ago. This question refers to the adult life circumstances of adolescent gang members. The more important question, however, pertains to whether gang joining has an impact on such circumstances. In other words, are there long-term consequences of gang membership that exist years after the event of gang joining? These consequences differ from studies that have demonstrated the short-term costs of gang membership, which focus on the criminogenic effects of gangs within a one to two year time-span using samples of teenagers. It is only in the long-term, or over the course of extended time periods, can life-course concepts—trajectories and turning points—be understood (e.g., the Blueprints criteria). As a whole, turning points cannot be established over brief time periods because it takes time for the trajectories to unfold (Sampson and Laub, 2005). Further, while long-term consequences of gang membership in adulthood can be understood among active and former gang members, the main point is that there has been an established period from the point of gang joining to current life circumstances. The degree to which the following research abides by this criterion varies, as each study was included to establish some semblance of an understanding of adulthood life for individuals with a history of gang membership.

Qualitative Perspectives

Based on ethnographic work with gangs in Boston, Los Angeles, and New York City, Sanchez-Jankowski (1991: 61-62) held that there were six possible outcomes of gang membership: (1) persistent street gang membership; but if one has disengaged, they (2) remain involved in illicit activities; (3) pursue other criminal associations, such as smaller criminal crews or organized crime groups; (4) are incarcerated, disconnecting the individual from the street gang, but potentially connecting with a prison gang; (5) pursue legitimate employment, participating in the lifestyle they avoided in their past; and (6) died, from drug overdose or violent confrontation. Sanchez-Jankowski provided no evidence with regard to the prevalence of these outcomes among gang members, as these were based on his general observations. Nevertheless, the substance of all but one of these categories is inconsistent with conventional ideas of success in adulthood.

Moore (1991) reported on the life patterns of gang members in adulthood from “early” and “recent” cliques¹² of two longstanding East Los Angeles gangs—White Fence and Hoyo Maravilla—with a history that stretches back to the 1940s. Drawing from an assembled roster of the gangs, Moore obtained interviews from a sample of 158 individuals with a history of membership with

¹² Early and recent cliques were distinguished according to whether they emerged before or after 1958. Moore reported that the cutpoint was chosen “arbitrarily as a useful halfway mark,” but all “pre” cliques originated between 1944 and 1950 and all of the “post” cliques originated between 1964 and 1972. This permitted Moore to comment on economic deindustrialization in Los Angeles and how it affected each cluster of cliques differently. As she reported, gang members from more recent cliques were more likely to rely on illicit income compared to those from earlier cliques.

the two gangs.¹³ The picture painted in this study was that of adult maladjustment. While some male and female gang members settled down, started families and pursued conventional employment, this was not the modal outcome. High rates of early parenthood, unemployment, literacy barriers, and failed relationships made the adolescence-adulthood transition difficult for many of the individuals Moore interviewed. The continued allure of the gang contributed to weakened familial stability, and upon familial dissolution, the gang was the first place they turned. Moore identified three types of adult outcomes for gang members: *tecatos*, *cholos*, and *squares*. *Tecatos* and *cholos*, accounting for approximately one-quarter and one-third of the sample, respectively, were still involved in “gang relationships.” *Tecatos* were heroin addicts that experienced intermittent bouts of imprisonment, while *cholos* were the undereducated and unemployed that retained gang ties because of economic circumstances. *Squares*, on the other hand, accounting for roughly 40 percent of the sample, led “conventional lives” with consistent employment and durable family lives.

In Hagedorn’s (1998) second edition of *People and Folks*, he followed up on the status of a sample of gang members from Milwaukee (see also Hagedorn, 1991). First interviewed in their early 20s, around 1986, Hagedorn was interested in changes that took place as the sample approached their 30s, in the early 1990s. Gang members did not fare well in their adult life. As a whole, the subjects had dismal high school graduation rates, high rates of unemployment, relied on

¹³ Unfortunately, Moore does not clearly specify the precise number of subjects that remained in the gangs. Instead, life outcomes were differentiated by (1) whether the person used heroin and (2) early and recent cliques.

underground markets for income, depended on state welfare, and had children at young ages. Nearly 9 of 10 female gang members were mothers in their early twenties.¹⁴

In ethnographic studies, however, the tradeoff of detailed descriptions is the absence of systematic evaluation of the consequences of gang membership. It is necessary to have at least two points of data collected over time and a control group for comparisons to assess an outcome such as consequences of gang membership. Cross-sectional studies and studies without control groups fall short of this requirement and cannot speak to the unique effect of the gang on the circumstances of older current and former members. Thus, self-selection, memory recall, or unobserved factors could be accounting for these outcomes rather than gang membership itself (see Krohn and Thornberry, 2008: 150). Moore (1991: 130), however, held that “[i]t is almost certain that the adult years of most gang

¹⁴ Both Hagedorn and Moore held that there is a relationship between the dependence on the gang and the length in years of involvement. Because of the inability to absorb into conventional adulthood, Hagedorn (1991) held that gang members tend to remain involved with the gang for longer periods. Moore also reported that the “squares” in her study were simply peripheral members; it was the core members that were the cholos and remained in the gang for longer time periods (see also Horowitz, 1983). Thus, there is a competing relationship between dependence on the gang and dependence on conventional employment—when opportunities for the latter increase, dependence on the former should decrease in an inverse, linear fashion. For this reason, both authors relied heavily on Wilson’s (1987) deindustrialization hypothesis.

A theme for explaining desistance from gang membership in the literature is the maturation hypothesis. That is, during the transition from adolescence and to adulthood “[m]ost members of the gang simply mature out” (Vigil, 1988: 106) and assume adult roles. The age-graded nature of gang means that the aging of the peer cluster corresponds with competing time demands and responsibilities (e.g., employment, family) that pull adolescents and young adults away from the gang (Decker and Van Winkle, 1996: 269; Vigil, 1988; 2002: 63). This could be one of the reasons we know less about the adult lives of current and former gang members, as they tend to escape the parameters of sociological-criminology (Sampson and Laub, 1992). The implication of this hypothesis, however, is that as gang members begin to shed ties, they should be able to return to and/or mesh with conventional society (Pyrooz et al., 2012). The research described above provides only partial support for this hypothesis, which is unlikely to be fleshed out in qualitative settings.

members were rockier than those of their nongang peers in the neighborhoods.” Still, without more systematically collected information and comparison groups, it is impossible to determine whether this is the case for gang members from East Los Angeles. I now turn to quantitative studies that meet these requirements.

Quantitative Perspectives

Two bodies of studies from two very different research contexts have assessed the impact of gang membership on later life stages. Levitt and Venkatesh’s (2001a; 2001b) studies, conducted in a manner similar to Hagedorn (1998), were based on a follow-up to earlier ethnographic work carried out by Venkatesh (1997) in Chicago’s Robert Taylor housing projects. Thornberry and colleagues’ (2003; Krohn et al., 2011) studies were based on data from the Rochester Youth Development Study, which was one of the three longitudinal *Causes and Correlates* studies sponsored by the Office of Juvenile Justice and Delinquency Prevention. The Chicago and Rochester studies are fundamentally different with regard to gang context (“traditional” vs. “emergent”),¹⁵ demographic, social, and economic characteristics (e.g., diversity, income inequality, politics), and the origin of the research (ethnographic follow up vs. systematic longitudinal surveys). As a result of these differences, convergent

¹⁵ Tradition, or “chronic,” gang cities are locations where there has been a gang problem prior to 1980. These cities are characterized by well-developed gangs, gangs that tend to display resilience, more formal organizational gang structures, and inter-generational gangs. “Emergent” gang cities, alternatively, are locations where the gang problem developed after 1980s. These cities are characterized by gangs with less formal organizational structure, gangs that are less entrenched in communities, and less likely to observe inter-generational gangs (see Spergel and Curry, 1990; Klein, 1995).

findings would provide considerable support for the body of knowledge about long-term effects of gang joining.

Levitt and Venkatesh's (2001a; 2001b) studies consisted of 118 young males between 17 and 26 years of age that lived in a housing project building in 1991. They followed up on their sample, which included gang and non-gang members, in 2000 to examine a host of outcomes and related changes that occurred over that nine-year period. Only 76 percent ($N = 90$) of the original sample was included in their analyses because 11 subjects were deceased, 13 could not be located, and four refused to participate. The data for the study were drawn from unlikely sources, as community members—e.g., teachers, clergy, social workers—were asked to report on the physical strength, troublesomeness, work ethic, school seriousness, and likeability of the subjects. Other information was collected retrospectively from the subjects by way of survey administration.

In 1991, the subjects were 21 years of age on average, half were employed, fewer than one-third of the subjects had an employed primary guardian, and the average 9th grade GPA was a C. In 2000, 60 percent of the subjects graduated high school, three-fourths were employed, 12 percent were currently incarcerated while 60 percent had a history of incarceration, nearly one-third of the subjects still lived in housing projects, and the average total income (legal and illegal) exceeded \$21,000 a year. These results differed between the 29 individuals who were gang members and the 61 non-gang individuals. Gang members were less likely to graduate from high school and to hold employment, and were more likely to be incarcerated and to have been shot. Further, non-gang

subjects secured more income from legal sources of employment while gang subjects obtained greater income from illegal sources.

Levitt and Venkatesh examined the effect of gang membership in a multivariate context on nine life outcomes, including high school graduation; current employment; current incarceration; ever incarceration; annual total, legal, and illegal income if not incarcerated; number of times shot; and residency in a housing project. They found that the bivariate differences between gang and non-gang subjects and life outcomes were reduced once controlling for other background factors. Nonetheless, gang membership in 1991 was still positively associated with having been incarcerated, number of times shot, and annual illegal income, and negatively associated with annual legal income. No differences were observed, however, for high school graduate, current employment, public housing residence, and current incarceration, indicating that the harmful effects of gang membership may manifest mostly in outcomes of direct criminological relevance rather than outcomes of indirect criminological relevance (i.e., failures in other social and economic domains).¹⁶

Thornberry and colleagues' (2003; Krohn et al., 2011) studies consisted of a sample of nearly 1,000 at-risk youth attending middle schools in Rochester,

¹⁶ It is important to point out, however, that the "gang" effect operated differently between the two studies (2001a; 2001b). While the 2001a study focused more on labor market outcomes and the 2001b study focused on a variety of outcomes, there were two inconsistencies between the studies with regard to labor market outcomes. Active gang membership, as they termed it, was not statistically related to any of the labor market outcomes in the 2001a study. Yet, this variable in the 2001b study predicted decreases in legal income ($b = -6,123, p < .05$) and increases in illegal income ($b = 5,299, p < .05$). The studies differed slightly in the set of predictor variables (9 vs. 10, 5 of which were consistent between studies), which could account for the divergence. Nevertheless, the latter paper was reported above because Levitt and Venkatesh (2001a: 83) concluded that "youthful gang involvement has a long-run impact on an individual's economic trajectory."

New York. These youth were surveyed systematically (in 6- and 12- month intervals) until the ages of 20-23 (Thornberry et al.) and 29-31 (Krohn et al.). Compared to Levitt and Venkatesh (2001a; 2001b), they were better positioned to answer questions about the long-term consequences of gang membership. They argued that gang members would be less successful in accomplishing normative transitions than gang abstaining youth. Instead, gang members would experience non-normative, “precocious” transitions. For this reason, in Thornberry et al. (2003: 167-168), they were interested in examining high school dropout, teenage parenthood, early nest leaving, adult unemployment (excluding college enrollment and military service), cohabitation, and adult arrest. In addition, they partitioned the sample by gender and considered gang membership status for males only. Gang membership status included gang abstainers, short-term gang members (one year or less), and stable gang members (more than one year).

When comparing male youth who avoided gangs to male youth that joined gangs, the former were less likely to impregnate someone and cohabit than both short- and long-term gang members. In addition, differences emerged between gang abstainers and stable gang members. The former were less likely to drop out of high school, become a teenage parent, and have unstable employment patterns. When comparing differences by gang membership status, stable gang members were more likely to drop out of high school and become a teenage parent than short-term gang members. Differences emerge for females as well, where gang membership was associated with statistically significant, unfavorable outcomes. Gang joining females were more likely to drop out of high school,

leave the nest early, become pregnant early, become a teenage parent, and be unemployed. All told, across the five types of groupings for Rochester youth, there were substantial differences between youth that joined gangs and youth that avoided gangs.

Thornberry and colleagues (2003) then examined whether the bivariate findings could withstand other important influences in a multivariate context. As mentioned above in the limitations of qualitative studies, it is impossible to determine whether the differences reported were attributable to gang membership or some other unobserved factor. The strength of the Rochester data is that they contain information collected systematically from various theoretically-informed risk domains, including neighborhood, school, familial, peer, and delinquency factors, as well as negative life events. This is an important difference from Levitt and Venkatesh's (2001a; 2001b) studies, allowing Thornberry and colleagues to avoid respondent memory recall over 10 years or the recollection of community members.

Across a series of 20 OLS and logistic regression models, Thornberry and colleagues examined the effect of gang membership on the eight outcomes, which they referred to as precocious transitions. For males, the only difference between *short-term gang members* and gang abstainers was cohabitation, where the former had 1.71 greater odds of cohabitating than the latter. *Stable gang members*, on the other hand, had anywhere from 1.94 to 3.42 greater odds than gang abstainers in seven of the eight outcomes, including high school dropout, early impregnation, teenage parenthood, unstable employment, cohabitation, and adult arrest. For

females, *gang membership* increased the odds of early pregnancy, teenage parenthood, unstable employment, and adult arrest by over 2 times. Further, when examining the sum of precocious transitions, stable male gang membership and female gang membership increased the number of precocious transitions experienced by .87 and .45, respectively, net of controls. In sum, with few exceptions, the results of the multivariate models confirmed the finding that gang membership “increases the likelihood that youths will experience off-time and unsuccessful transitions” (179). These effects are least pronounced among those who remain in gangs for brief time periods.

In their later study (Krohn et al., 2011), the sample was approaching their early thirties, permitting an assessment of even longer-term effects of adolescent gang membership. This study, however, focused only on males who were not incarcerated in the final two waves of study ($N = 412$). Nearly 28 percent of the sample reported at least one wave of gang membership. However, the study used a single, interval level measure of repeated self-nomination to gang membership during adolescence which ranged from zero (never gang) to eight (always gang) waves.

A full structural equation path model was used to examine three periods of observation between adolescence and adulthood. First, they examined the influence of adolescent gang membership (wave 2-9) on a construct of precocious transitions—school dropout, early parenthood, early nest leaving, and cohabitation—that could have been experienced through early adulthood (waves 2-12). This approach, as a whole, was consistent with Thornberry et al. (2003).

Second, they examined the effect of precocious transitions on adult role/status fulfillment (wave 13), which was conceptualized in terms of economic hardships (i.e., unemployment and/or welfare) and family problems (i.e., interpersonal problems in the household), and measured at the wave before the final outcome. Third, they examined the effect of economic hardships on self-reported street crime and arrest (waves 13-14). Importantly, they held constant the effects of aggression, street crime, academic aptitude, conventional values, concentrated disadvantage, race, and negative life events at each stage of the model.

Krohn and colleagues' (2011) findings were consistent with their posited theoretical model. Gang membership exerted a moderate effect on precocious transitions, which in turn led to increases in economic hardship and family problems in emerging adulthood. Role/status fulfillment variables then influenced rates of self-reported street crime and arrest in adulthood. The authors held that these findings lend support for the theoretical model specified in the study, as well as Thornberry and colleagues' (2003) study, and for the cascading effects of adolescent gang membership on the life-course.

STATE OF THE LITERATURE

Most research on gang membership using longitudinal data has concentrated on risk factors for gang joining or the short-term effect of gang membership on offending/victimization. Knowledge of the evolving consequences of gang membership is restricted to the handful of works mentioned above. Qualitative and quantitative research from four demographically, socially,

and economically divergent cities paint an unfavorable picture of the adult life circumstances of adolescent gang joiners. People with a history of gang membership are more likely to experience precocious transitions and victimization, participate and rely on the illegal economy, experience economic hardships and familial problems in adulthood, and engage in street crime and experience arrest many years after they joined a gang. The implication is that gang joining shares at least some responsibility for these circumstances. The consistent findings of negative outcomes across sites, racial/ethnic groups, and analytic techniques do not bode well for the adult lives of adolescent gang members. In effect, this evidence suggests that joining a gang in adolescence, compared to avoiding gangs, is a precursor to a life replete with difficulty and failure.

Questions remain, however, about the extent to which gang joining is responsible for the negative circumstances experienced by adolescent gang members in adulthood. There are three overarching limitations to the current status of the literature. The *first* limitation concerns the generalizability of the findings. To be sure, the long-term consequences of gang membership have been explored only in a select few cities. The consistency of the findings, as observed above, and the theoretical foundation for such findings help temper concerns with regard to this limitation; however, how generalizable are the experiences of gang members in the now-demolished housing projects of Chicago, barrios of East Los Angeles, Milwaukee, and western New York? This is not to the fault of the studies or the researchers, as it is more of a testament to how little we know about

life long after gang joining. Research from other sites and nationally representative data is necessary to build a body of knowledge.

The *second* limitation pertains to the timeframe in which the outcomes were measured and comprehensiveness of the outcomes. All of the studies examined these outcomes at only one cross-section in time. This means that knowledge from this line of research is limited to very specific time lags in relation to the onset of gang membership. The problem is that the consequences of gang membership might vary over time, worsening or perhaps recovering as distance from the group context increases. Not evaluating the longitudinal nature of these outcomes provides a very selective understanding of the consequences of gang membership on non-criminal outcomes in adulthood. Further, all of the studies concentrated on very specific outcomes, such as high school dropout or unstable employment. The problem is that this provides a very narrow understanding of the nature and patterns of educational attainment and employment and economic outcomes among high-risk youth.

The *third* limitation concerns the challenges that selection bias poses to the validity of the findings. Based on the logic of quasi-experimental research design, selection bias refers to a process in which subjects select into treatment in a manner that is not independent from the outcome of interest. Inadequately separating treatment from outcome—principally, modeling factors specific to the choice-set or the choice-maker—may result in biased inferences. As Gottfredson (2005: 55) pointed out, “selection bias is the first refuge of a propensity theorist when confronted with treatment effects in nonrandomized quasi-experimental

studies” (see also Glueck and Glueck, 1950). By not modeling the stable and dynamic non-random nature of gang membership,¹⁷ questions remain about whether the findings observed in the literature demonstrate the lasting significance of gang membership. In relation to the larger debates on persistent population heterogeneity and state dependence, the most serious limitation is that the “gang effect” may simply be an artifact of latent criminal propensities or other forms of selection. Ultimately, the supposed long-term consequences of gang membership boils down to an empirical question: After adjusting for selection into gangs, does joining a gang exert an adverse effect on later life circumstances?

This study answers this question with data and modeling strategies that address the above three limitations. The next chapter details the data and methods used to evaluate the effects of gang joining on the nature and patterns of educational attainment and employment in late adolescence and emerging adulthood.

¹⁷ It should be noted that Krohn et al. (2011) included modeled selection into gang membership using seven variables, including aggression, street crime, academic aptitude, conventional values, concentrated disadvantage, race, and negative life events. Although these are potential indicators for future gang membership, they did not report whether these variables partialled out observable forms of selection bias (especially in light of their interval measure of gang membership). A review of the literature on risk factors for gang membership (e.g., Howell and Egley, 2005; Klein and Maxson, 2006; Thornberry et al., 2003) would suggest a more comprehensive list of covariates.

Chapter 4

METHODS

DATA

Data from the National Longitudinal Survey of Youth, cohort of 1997 (NLSY97) are used to examine the research questions posed in this dissertation. The NLSY97 is coordinated by the Bureau of Labor Statistics and consists of a nationally representative longitudinal sample of persons born between 1980 and 1984. A sample of 8,984 respondents was generated based on a multi-stage cluster sampling design of 75,291 households. The NLSY97 employed a subsample design consisting of: 1) a sample of 6,748 respondents that is a nationally representative cross-section of youth ages 12 to 16 at the conclusion of 1996, and 2) a supplemental sample of 2,236 respondents that oversampled Blacks and Hispanics. Survey weights are applied where appropriate to ensure that values derived from the full sample are nationally representative. Respondents have been surveyed annually since 1997, with 13 waves of information now publicly available. Respondents were between ages 25 and 29 at the most recent wave, Wave 13, which consists of information collected in 2009.

There are several features of the NLSY97 that make it attractive for the proposed line of research, while also addressing the limitations detailed in the previous chapter. First, the data are nationally representative, thus the findings will not be constrained to one geographic area of the United States. Second, the data are rich, containing a large number of measures from questions covering a range of important life domains, including education and achievement scores,

employment and economic indicators, family and household characteristics, sexual activity, attitudes and expectations, dating and personal relationships, and criminal and deviant behaviors. Third, the systematic and longitudinal manner in which these data were collected cover long and influential time periods—about 50 percent of the respondents’ life—when adolescents are transitioning into emerging adulthood. Finally, by virtue of the sample size and the time periods covered in the life-course, the NLSY97 contains among the largest subsamples of gang members examined longitudinally in the research literature.

The NLSY97 has been used to address numerous issues in the larger criminological literature, such as the crime preventative effects of incapacitation (Sweeten and Apel, 2007) and the cumulative prevalence of arrest (Brame et al., 2011). Only recently have these data been extended to the context of gangs to examine issues such as arrest probabilities, drug dealing, drug use, and offending (e.g., Bellair and McNulty, 2009; Bjerck, 2009; Bjerregaard, 2010; Tapia, 2011). These studies, notably, have explored only the immediate criminal consequences of gang membership, using standard regression or fixed effects strategies with a maximum of a one-year time lag. Of course, the research questions motivating these studies concentrated on the short-term effects of being immersed in the gang context, as opposed to the lasting effects asked in this dissertation. Therefore, among the most appealing qualities of the NLSY97—13 waves of data collected annually—has not been met with research questions pertaining to the consequences of gangs that would maximize the breadth of the data.

GANG MEMBERSHIP

The key explanatory variable in this study is gang membership. Consistent with a long line of individual-level gang research, self-nomination is the technique used to operationalize gang membership (Esbensen et al., 2001; Junger-Tas et al., 2010). Esbensen et al. (2001: 124) referred to self-nomination as a “robust measure of gang membership capable of distinguishing gang from nongang youth.” Prior to asking respondents to self-report their gang involvement, respondents were presented with a definition of a gang. In asking respondents whether there were gangs in their neighborhood or school, the instrument defined a gang as “a group that hangs out together, wears gang colors or clothes, has set clear boundaries of its territory or turf, and protects its members and turf against other rival gangs through fighting or threats.”¹⁸ Two items later, respondents were asked, have you (1) “ever belonged to a gang” and (2) “been a member of a gang . . . [in last 12 months—at Wave 1] or [since the date of last interview—Waves 2-9]”? Those responding “yes” to were coded “1” for each respective question, and those responding otherwise were coded “0.” This strategy results in cumulative gang membership and time-varying gang membership indicators. In line with the quasi-experimental orientation of the theoretical

¹⁸ The NLSY97 definition presented to respondents to describe neighborhood/school gangs is more restrictive than the commonly used Eurogang definition—“A street gang is any durable, street-oriented youth group whose involvement in illegal activity is part of its group identity” (Klein and Maxson, 2006: 4). The discrepancy between the NLSY97 and Eurogang definitions harkens back to disagreements in the degree to organization and crime should be incorporated into the definition of a gang (Klein and Maxson, 2006). Nevertheless, the features used to describe gangs in the NLSY97 do not appear to unduly influence the self-nomination process. As the results of this dissertation will indicate, the nature and patterns of gang membership in this study do not diverge substantially from the general body of gang research, especially longitudinal studies.

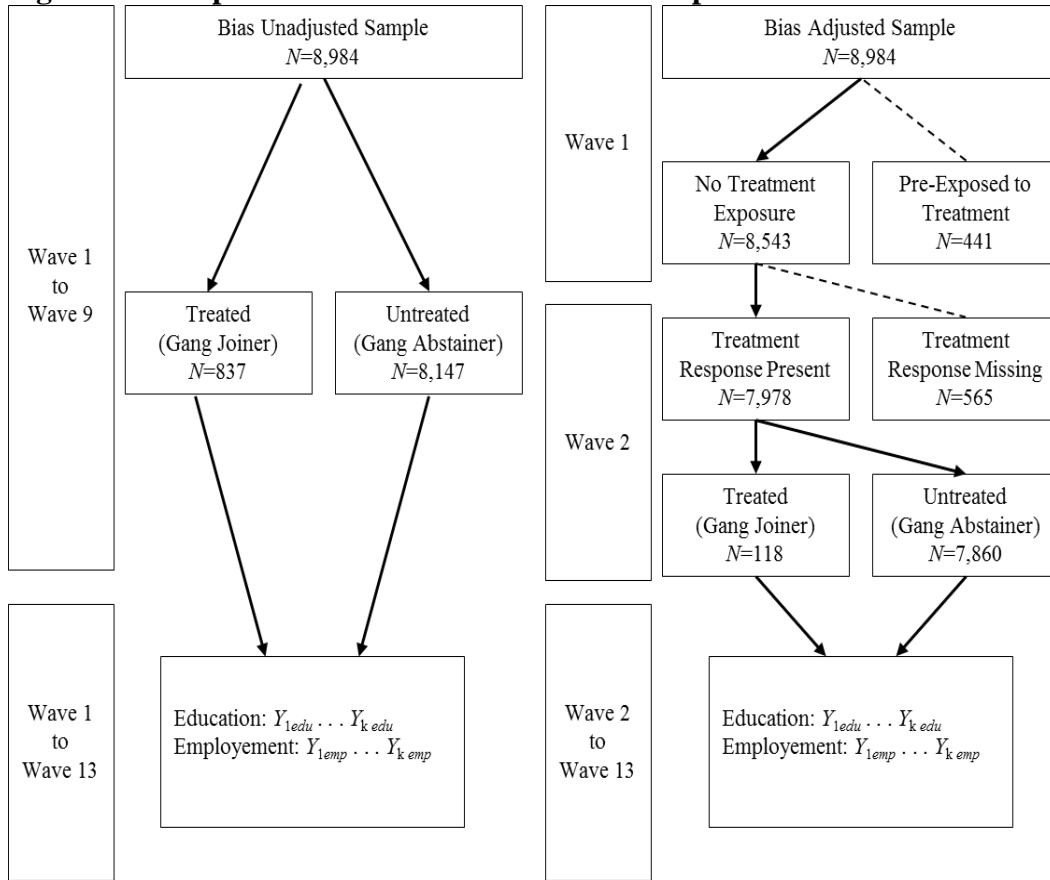
framework and analytic strategy, gang membership serves as the treatment of interest in this dissertation.

FULL AND SELECTION SAMPLE

Figure 4.1 provides the properties of the full and selection sample, detailing the identification of treatment in relation to the study waves before and after adjusting for bias. The left-hand side of the Figure 4.1 ignores issues of selection bias and temporal ordering, instead modeling the association between gang joining ($N=837$) between Waves 1 and 9 on outcomes drawn from Waves 1 to 13. The differences observed between gang joiners and gang avoiders could be considered naïve, in that they are bivariate and ignore any and all alternative explanations of the relationship. The right-hand side of the Figure 4.1 details the methodological approach used in the current study in the following manner: Wave 1 covariates were used to model time-stable and time-varying factors associated with selection into gang membership at Wave 2, and education and employment outcomes were observed thereafter.

There are several reasons why this approach proves advantageous. First, the wave at which treatment was measured, Wave 2, contained the largest volume of first-time gang joiners ($N=118$). As Figure 4.1 indicates, 441 respondents were removed from the study because they had been involved in gang previously, which would introduce imprecision into the treatment. Second, this permitted the observation of the contemporaneous, the evolving, and the cumulative consequences of gang membership over a 12-year period. Third, the wave at which selection factors were tapped, Wave 1, contained a more comprehensive

Figure 4.1. Properties of the full and selection sample



catalog of risk factors for gang membership than the remaining NLSY97 waves. For this reason, longitudinally modeling selection into gang membership would not be adequate.

OVERVIEW OF THE ANALYTIC STRATEGY

This study employs two main strategies to investigate the long-term consequences of gang membership on educational attainment and employment outcomes. The most basic approach to answer this line of questioning is to examine the bivariate relationship between gang membership, X , and outcome, Y . If “evers” (i.e., individuals ever in a gang) experience poorer life circumstances in

emerging adulthood than “nevers” (i.e., individuals never in a gang), then this would support the hypothesis that gang membership acts as a disruptive snare in the life-course, impacting later educational and employment trajectories. There are two pressing problems tied to this approach: (1) it does not establish that *X* occurs prior to *Y* and (2) it does not rule out third variables that influence the *Y*. Without accounting for the temporal ordering of the relationship and incorporating extraneous explanatory variables, the most one can conclude is that there is an *association* between gang membership and adulthood life circumstances. Thus, it is impossible to determine if gang membership is causally linked to the study outcomes, rendering unclear the lasting significance of gang membership in the life-course.

Issues remain, however, even if one were to correctly order temporally the cause-effect relationship *and* account for relevant explanatory factors. These issues revolve around selection bias because joining a gang is not a random process. There are static and dynamic factors that elevate risk for gang joining and not modeling these factors explicit from the outcome of interest may run the risk of biasing the estimates.

Table 4.1 details how findings can be interpreted—with and without selection adjustment—in relation to Nagin and Paternoster’s (2000) life-course framework used to explain the continuity in problem behaviors. There are four possible outcomes. First, *without controlling* for selection, if adverse effects are *not observed* then the analysis essentially “stops”: There is no relationship between gang membership and poor adult life circumstances. As discussed above,

Table 4.1. Life-course perspectives on the continuity in problem behavior

		Selection adjustments?	
		No	Yes
Adverse effects?	No	Neither	PH
	Yes	PH and SD	SD

PH = Persistent heterogeneity
SD = State dependence

research on this subject suggests that this is not the case. Second, *without controlling* for selection, if adverse effects *are observed*, it is impossible to determine whether this outcome is a consequence of the state of gang membership or criminal characteristics. In many ways, this is where the state of the literature was with respect to the gang membership-delinquency link in the early 1990s. Third, *controlling* for selection, if adverse effects are *not observed*, this is consistent with the notion that individuals routinely self-select into high-risk environments. In other words, gang membership is simply another manifestation of a latent factor(s) that reverberates across the life-course. Fourth, and finally, *controlling* for selection, if adverse effects *are observed* then this would provide evidence that gang membership maintains long-term consequences, conditional on the degree to which selection was adequately modeled.

There are several strategies to control for the endogeneity of gang membership, including standard or generalized linear regression, instrumental variable, and propensity weighted techniques. The goal of all of these strategies is to partial out the non-random components of gang joining—i.e., factors specific to the choice-set and the choice-maker—that could reduce or eliminate the effects of gang membership on the study outcomes. The current study uses two variants of propensity score weighting to address selection into gang membership: one for the

education analyses and the other for the employment analyses. As detailed below, propensity score weighting addresses selection using observable information (Rosenbaum and Rubin, 1983; 1985).

First, in the educational attainment chapter, a standard form of propensity score matching analysis is carried out, whereby treated and untreated cases are matched according to a vector of covariates that comprise the gang joining propensity score with the goal of approximating an experimental research design.

Second, in the employment analysis, two-level random effects regression models are estimated. Treatment effects are examined over time, conditional on the gang joining propensity score. Of course, any selection-on-observables strategy is only as good as the data used to estimate the propensity scores—the rich information found in the NSLY97 meets such a challenge.

Estimating Propensity Scores

The first stage of the analytic strategy involves obtaining propensity scores. Rosenbaum and Rubin (1983: 41) defined propensity scores as “the conditional probability of assignment to a particular treatment given a vector of observed covariates.” The goal in this approach is to model the non-random elements associated with selecting into treatment (i.e., gang membership). Propensity scores are derived from a Bernoulli distribution (and the logistic link function) because gang membership is a dichotomous measure (1=treated, 0=untreated). As such, it is necessary to have a clearly defined or well-specified indicator of treatment, and the strategy outlined in Figure 4.1 permits very little

ambiguity: those joining a gang for the first time at Wave 2 are “treated,” while those avoiding gang joining at Wave 2 are “untreated.”

The strength of selection-on-observables strategies rests on the degree to which elements of the selection process are observed in the data. Strong ignorability of confounders applies only if the relevant and exhaustive set of covariates is used to model selection. The NLSY97 satisfies such a requirement, especially at Wave 1. Reviews of the selection-into-gangs literature (Howell and Egley, 2005; Klein and Maxson, 2006; Krohn and Thornberry, 2008) organize risk factor variables into five domains: individual, family, peers, community, and school. Drawing from Wave 1, a total of 45 covariates that spanned these risk domains were used to model selection into treatment. The covariates included in these domains are consistent with several theoretical perspectives on gangs and delinquency, including social control, social learning, propensity, opportunity, general strain, and social disorganization theories. For example, respondents reporting having friends or family members that are involved in gangs is consistent with Akers’s (2009) theory of social learning, where exposure to gang friends/family introduces definitions and reinforcements favorable to gang membership. In addition, individuals residing in areas characterized by high levels of racial and ethnic heterogeneity are more likely to be involved in gangs due to increased social distance, elevated levels of threat, and limited informal social control capacities (Pyrooz, Fox, and Decker, 2010; Sampson, Raudenbush, and Earls, 1997). The exhaustiveness of this vector of covariates serves as a medium between what has been described as theoretically-informed and kitchen-sink

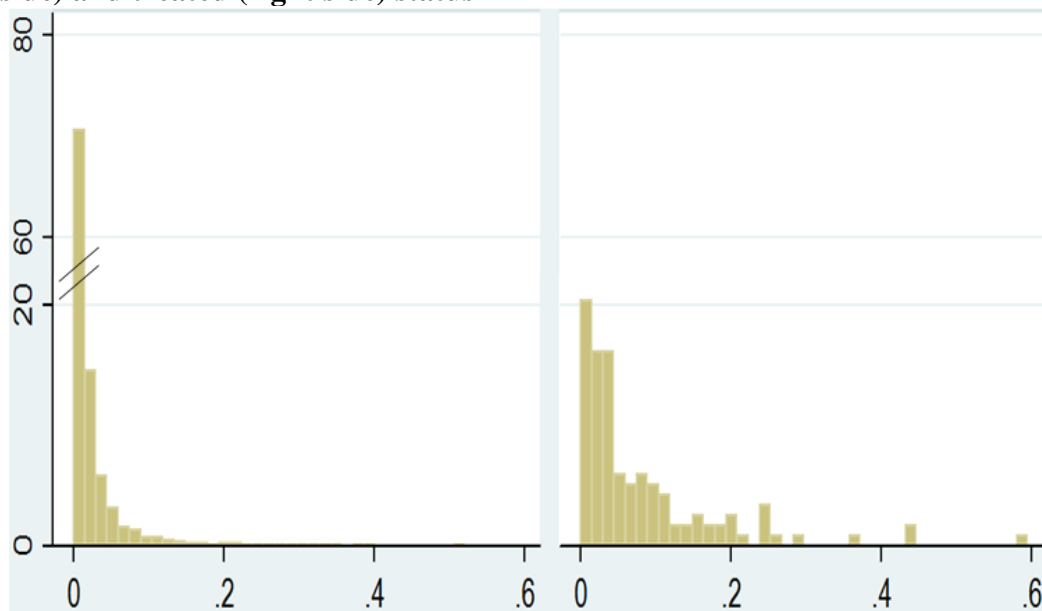
approaches (Apel and Sweeten, 2010a). Appendix B provides the descriptive statistics for the covariates used in the selection model.

Of the 7,978 respondents included in the first stage of the analysis, 118 joined a gang for the first time. The base-rate of gang joining, 1.5 percent, is problematic when modeling binary dependent variables using traditional logistic regression. King and Zeng (2001) reported that when events occur at a rate of less than 5 percent and when the number of observations do not exceed a few thousand, the probability of occurrence will be overestimated for $P(Y=0)$ and underestimated for $P(Y=1)$. Tomz, King, and Zeng (1999) introduced the ReLogit—rare event logistic regression—program that runs in the Stata platform and produces coefficients that are corrected for rare-event biases.

Gang joining at Wave 2 was regressed on Wave 1 covariates in both traditional and rare events logistic regression forms (see Appendix C for both the logit and ReLogit estimates). The McFadden's pseudo R -square was .17 in the traditional model, indicating that 17 percent of the variation in gang joining was explained. Using the treatment probability ($P=.018$) as the classification threshold, the sensitivity rate—true positives—in the rare events model (80%) outperform the traditional model (75%). The traditional model correctly classified 76 percent of the sample, compared to 71 percent in the rare events models. King and Zeng (2001: 702) reported, however, “When the results make a difference, our methods [ReLogit] work better than logit; when they do not, these methods give the same answer as logit.” As such, the current study uses the rare events strategy to obtain the predicted probabilities to reduce the likelihood of bias.

The histogram presented in Figure 4.2 details the distribution of the predicted probabilities for treated and untreated respondents. Both distributions are positively distributed, with about 70 percent of untreated cases falling within the lowest bin or vertical line, compared to roughly 20 percent of treated cases. Note that among untreated cases, the sheer volume in the sample gives the impression that there are incomparable cases or severe issues of support. This is not the case, however. While the mean propensity score for the treated group ($P=.083$) is four and one-half times greater than the untreated group ($P=.018$), there are 303 untreated cases with propensity scores that exceed the mean of the treated group. In other words, there are sufficient cases to compare against gang joiners.

Figure 4.2. Histogram of predicted probabilities according to untreated (left side) and treated (right side) status



MODELING EDUCATION ATTAINMENT

Propensity score matching techniques were used to assess the impact of gang membership on educational attainment. As Apel and Sweeten (2010a) detailed, after estimating the propensity score, it is necessary to determine whether the conditional independence assumption is met. The conditional independence assumption (CIA) in propensity score matching holds that treatment is random conditional on observed information (Rosenbaum and Rubin, 1983). That is, the outcome is independent of treatment given the vector of covariates used to model selection into treatment. Because statistical rather than physical control is exerted over assignment to the treatment condition, it is necessary to assess whether the CIA is met. To do this, treated and untreated individuals are matched—using various techniques described below—based on their propensity for treatment. Balance is then assessed according to the degree to which treated and untreated groups “look alike” or are “observationally equivalent” (Apel and Sweeten, 2010a), based on the observed covariates before and after matching. If balance is achieved in the current study, it makes a stronger case for making the assumption that gang joining is randomly assigned, given the observed information.

There are several methods for matching treated and untreated groups according to their propensity scores (Smith and Todd, 2005). Several matching algorithms were used to model the relationship between gang joining and the study outcomes, including those derived from the following eight matching estimators: (12) one-to-one and three-to-one nearest neighbor caliper matching,

(3) radius matching,¹⁹ (45) kernel matching (Epanechnikov and Gaussian),²⁰ (6) local linear matching, and (78) five and ten subclass stratification. Each estimator varies in how the “neighborhood” (i.e., immediate area surrounding the propensity score value) around the predicted probabilities of treated cases is defined and weighted. Varying the construction of the counterfactual—in terms of the number of observations (e.g., from 1 to n) or the weighting parameter (i.e., the bandwidth)—creates a trade-off between bias and variance as the neighborhood expands (Caliendo and Kopeinig, 2005; Smith and Todd, 2005). Neighborhood expansion, while reducing the variance, comes at the expense of increased bias, as more distant observations are allowed to influence the estimate. For nearest neighbor matching approaches, a caliper distance of .01 around the treated case was specified. For kernel matching approaches, a bandwidth parameter of .02 was specified for weighting according to treated case propensity scores. Such specifications keep the neighborhood “tight” and exclusive in terms of influences on the treated cases. Examining multiple specifications of matching estimators

¹⁹ Caliper and radius matching are variants of nearest neighbor matching. To avoid matching treated cases to their most immediate (and potentially distant and very different) neighbor, a caliper is used to designate a maximum distance along the probability distribution from which to draw a specified number of untreated nearest neighbors to compare to a treated case. If no untreated cases fall within the specified caliper, the treated case is dropped from the analysis. All matched cases are given equal weight in the estimates.

²⁰ In Kernel matching approaches, untreated cases are weighted to each treated case according to a finite probability distribution and a specified bandwidth. Approaches differ according to how untreated cases falling outside and inside of a specified bandwidth, or radius, are treated. Uniform kernel matching includes every available untreated case within the bandwidth or radius of the treated case, each weighted equally according to 1 divided by the sum of qualifying untreated cases. Gaussian kernel matching includes every untreated case weighted according to the specified bandwidth (i.e., kurtosis) of a normal distribution centered over the treated case. Similar to uniform matching, the sum of the weighted untreated cases equals one, but greater weight is afforded to cases less distant to a treated case’s propensity score. Epanechnikov kernel matching blends uniform and Gaussian approaches in that untreated cases falling outside of the bandwidth are assigned a weight of zero, but untreated cases falling inside of the bandwidth are weighted inversely (and summed to one) according to their distance from a treated case’s propensity score.

serves to carefully assess the robustness and sensitivity of the findings (Apel and Sweeten, 2010a).

The results presented in the current study are derived from kernel matching using an Epanechnikov estimator. This estimator was used for several reasons: (1) it is the default kernel estimator in Leuven and Sianesi’s (2003) `psmatch2` program for Stata; (2) it weights untreated cases within the specified bandwidth, thus operating as a medium between neighbor and kernel approaches; (3) its estimates using the `psmatch2` program in Stata introduced the least amount of bias compared to a host of other approaches (Morgan and Harding, 2004; see also Frolich, 2004; Heckman, Ichimura, and Todd 1998; Heckman, Ichimura, Smith, and Todd 1998; Smith and Todd, 2005); (4) it presented a “middle of the road” estimate for the current study between the lower and upper bounds detailed in Appendix E; and (5) the Epanechnikov estimator resulted in the greatest reduction in standardized bias, outperforming other matching estimators.

Standardized differences—equivalent to Cohen’s d (Cohen, 1988)—are used to evaluate the CIA by assessing covariate balance before and after matching (Rosenbaum and Rubin, 1985). This is determined using the following equation:

$$SD_z = 100 \times \frac{M_{z,t} - w(M_{z,u})}{\sqrt{\frac{var_{z,t} + var_{z,u}}{2}}}$$

where the numerator is the mean difference between the treated group (t) for covariate z and the propensity score weighted or adjusted by the untreated group (u); the denominator is the square root of the average of the variances between

treated and un-weighted untreated groups for covariate z ; and SD refers to the standardized difference between treated and untreated groups for covariate z . A threshold of $|20|$ is typically used to determine (im)balance (Rosenbaum and Rubin, 1985), but an even more conservative threshold of 10 can be used to assess any remaining bias (Rosenbaum and Rubin, 1985).

Table 4.2 displays the distributional properties of the absolute standardized differences for the 45 covariates used to model selection into treatment. Prior to matching, the average standardized difference approached 24; after matching, the average standardized difference was less than 3, equating to an 80 percent bias reduction (Appendix D details individual covariate differences before and after matching). Further, 23 of the 45 covariates were imbalanced prior to matching at the $|20|$ threshold, whereas no covariate was imbalanced at neither the $|20|$ threshold nor the even stricter $|10|$ threshold after matching. The evidence from this balancing test—based on the least conservative matching or weighting scheme—provides support for moving forward and obtaining the propensity score estimates. In other words, after matching gang joining and gang avoiding

Table 4.2. Distributional properties of covariate standardized differences

	Absolute Standardized Differences	
	Before matching	After matching
Mean	23.6	2.4
(SD)	(16.1)	(1.8)
1st	1.1	0.2
25th	10.8	1.0
50th	21.7	2.1
75th	35.9	3.7
99th	60.2	5.9

Unit of analysis = covariate
 $N = 45$

respondents, treatment is assumed to be random conditional on the vector of covariates used to model selection into gangs.

MODELING EMPLOYMENT

Unlike the propensity score matching strategy proposed to analyze educational attainment, patterns and characteristics of employment do not follow stable pathways. This is especially the case during the adolescent-to-adulthood transition that this dissertation is interested in observing. Whereas educational attainment functions more comparably to a “trap-door” (i.e., attainment is rarely lost), respondents could be gainfully employed full-time at age 22, out of the labor force at age 23, and working part-time at age 24. Further, all of these employment states could be observed within one year. Note that Wave 13 of the NLYS97 was collected at the height of the “Great Recession” in 2008, thus adding to the instability of labor supply and job quality outcomes. Further, missing data present additional challenges to matching approaches for employment outcomes. Whereas educational gains flatten out midway through the study, thereby reducing concerns about missing data, labor supply and job quality outcomes vary widely in the later waves, especially as respondents are moving into increasingly better-compensated positions of employment. This makes it difficult to detect statistical differences in a model that is already threatened by limited statistical power and the potential for inflating standard errors; a trade-off due to the very precise specification of treatment.

For these reasons, two-level growth curve regression models were estimated to chart the trajectories of the employment outcomes, where full information maximum likelihood (FIML) handles missing data. Further, the longitudinal design of the research increases the sample from 7,978 persons to persons*periods, which ranges from 61,892 to 91,186, depending on the outcome. The general model takes the following form:

$$Y_{it} = \beta_{0i} + \beta_{1i}Time_{it} + \beta_{2i}Time_{it}^2 + \varepsilon_{ti} \quad (1)$$

$$\beta_{0i} = \gamma_{0,1} + \gamma_{0,2}Gang_i + \gamma_{0,3}Propensity_i + \zeta_{0,i} \quad (2)$$

$$\beta_{1i} = \gamma_{1,1} + \gamma_{1,2}Gang_i + \gamma_{1,3}Propensity_i + \zeta_{1,i} \quad (3)$$

$$\beta_{2i} = \gamma_{2,1} \quad (4)$$

where Y_{it} refers to an employment outcome of person i at time t , β_{0i} is the grand mean, and β_{1i} and β_{2i} are linear and quadratic growth terms representing time in years and time in years squared from treatment, respectively. The intercept and linear terms, ζ , were allowed to vary because people follow various employment pathways. The linear term was centered at year 5 to compute the quadratic term to ease issues of collinearity. Equations 2 and 3 answer the key questions in this study: does gang joining influence average within-individual levels of employment and within-individual employment growth curves conditional on the propensity to join a gang? Holding selection into gangs constant allows us to ascertain the marginal and cumulative effects of gang membership across the 11-year period from the time of gang joining. Moreover, it allows us to determine if gang joiners follow differential patterns of employment in the life-course. All analyses presented in Chapter 6 include the marginal effects of gang joining based

on the fixed terms to examine whether any of the effects change in magnitude over time.

CONCLUSION

The effect of gang membership is examined over a 12-year period from the point of joining a gang, when respondents' propensity to join a gang was assessed. Both propensity score matching and growth curve approaches were used to examine the impact of joining a gang on education attainment and employment status after controlling for selection into gangs. Other approaches could isolate the effect of gang joining while also documenting life circumstances occurring in between the measurement of treatment and the outcomes, but the above strategies are superior to alternative approaches for the following reasons:

- (1) the list of Wave 1 selection covariates is not as comprehensive in subsequent waves, making it problematic to model dynamic selection into gang membership after Wave 2,
- (2) the observed rate of first-time gang membership peaks at Wave 2 and declines steadily thereafter,
- (3) respondents that experience treatment at later waves are observed for shorter time periods, decreasing the chances of observing accumulating consequences of gang membership, as hypothesized,
- (4) the current strategy is a stringent and conservative test of the impact of gang membership, by virtue of future gang joiners among the untreated groups,
- (5) the current strategy appeals to the principles of experimental research design, in that conditional on the assumption that treatment is independent of the outcome, group differences can be attributed to the treatment of first-time gang membership.

With regard to the last point, it is worth noting that future behaviors such as persistent gang membership are not explored because that involves a different form of selection into treatment. As a result, the proposed analytic strategy provides an unambiguous test of the impact of gang joining between 1998-1999 on educational attainment and employment histories through 2009.

The next two chapters present the findings from the analytic models discussed above. These chapters begin by providing a brief introduction to the issue, identifying the void in the literature that each respective chapter seeks to fill. Next, the prior empirical literature is discussed and the specific mechanisms linking gang membership to the study outcomes are explained. After articulating the theoretical framework for the chapter, the measurement and operationalization of the study outcomes are detailed. Each chapter concludes by presenting the results of the cumulative and longitudinal impact of gang joining on the study outcomes before and after adjusting for gang selection processes. This allows us to disentangle effects that are attributable to selection from those that are attributable to gang joining. The final chapter of this dissertation discusses the key conceptual and policy implications from this research.

Chapter 5

THE IMPACT OF ADOLESCENT GANG MEMBERSHIP ON EDUCATIONAL ATTAINMENT

Education is a critical element of success in developed countries. As Kingston et al. (2003: 53) noted, “education is a great independent variable” for social scientists because of the numerous and diverse benefits associated with it. While the monetary rate of returns to education is most closely linked to its virtues (Becker, 1964; Card, 1999; Hout, 2012; Mincer, 1958), education is also linked robustly to other social and non-market factors, including reduced prejudice and delayed adult mortality, and increased civic engagement, healthiness, marital stability, and life satisfaction (Kingston et al. 2003; Hout, 2012; Lleras-Muney, 2005; Oreopoulos and Salvanes, 2011; Mirowski and Ross, 2003; Schwartz, 2010; Haveman and Wolfe, 1984; 1994). While the upper portion of the educational attainment distribution may reveal such positive attributes, concentrating on the lower end exposes social and economic challenges. For example, the “Great Recession” of 2008 hit the less educated the hardest, where those with only a high school diploma were unemployed at half the rate of their counterparts with a bachelor’s degree (Bureau and Labor Statistics, 2011). In addition, the majority of inmates in local, state, and federal correctional facilities lack a high school diploma (Harlow, 2003). As such, understanding factors that impact—both positively and negatively—educational attainment remains a high priority for stakeholders of the education system. For this reason, research across several disciplines has examined the individual and institutional factors that

influence persistence in and drop out from school (Finn; 1989; Fredericks et al., 2004; Rumberger and Lim, 2008; Sweeten, 2006; Tinto, 1975).

Missing from the current inventory of research on educational attainment is an assessment of the consequences of gang membership. Gang membership impacts lives in significant ways. Indeed, not only does joining a gang increase delinquent offending and violent victimization risk at alarming rates, it also negatively influences the attitudes, emotions, social bonds, and routine activities of gang members (Decker and Van Winkle, 1996; Melde and Esbensen, 2011; Decker and Pyrooz, 2010a; Peterson et al., 2004; Taylor et al., 2007). This study conceptualizes gang membership as a disruptive snare in the life-course, isolating and repelling individuals away from the virtues of educational institutions. Yet, much like how the educational returns literature has concentrated overwhelmingly on economic gains, the criminological literature on gang membership has focused overwhelmingly on (especially violent) offending and victimization outcomes. This is problematic because it gives the narrow impression that the consequences of gang membership are limited only to criminal domains. The social forces associated with joining a gang will likely cascade beyond the traditionally hypothesized domains of offending and victimization and into other significant life domains such as education.

This chapter examines whether adolescent gang membership has a negative impact on educational attainment. Using data from a nationally representative sample, this study followed gang joining and gang avoiding youth over 12 years, from adolescence to emerging adulthood. To account for the non-

random nature of gang joining, propensity score matching—a selection-on-observables strategy (as detailed in Chapter 4)—was used to model the effect of gang membership on cumulative educational attainment. Not accounting for the endogeneity of gang membership could lead to biases that bear on the substantive implications of the research. This study also examines the consequences of gang membership on specific milestones in educational trajectories, including general equivalency degree, high school diploma, post-secondary matriculation, 2-year college degree, 4-year college degree, and advanced degree. By utilizing the longitudinal nature of the data, this study is able to examine if and how the consequences of gang membership on educational outcomes emerge over time. In doing so, this provides a more comprehensive understanding of the consequences of gang membership, identifying where individuals get “tripped up” in their educational trajectories. Given the central and lasting role that education plays in the lives of individuals and the turning point significance of joining a gang, it is necessary to better understand how these factors intersect in the early life-course.

EDUCATIONAL ATTAINMENT

Education follows developmental stages of learning and attainment. Since students progress from grade to high school, and then to post-secondary forms of education, trajectories of educational attainment can be characterized by continuity and change over the life-course—from the onset and persistence in educational gains to the termination of educational gains. Most Americans earn the equivalent of a high school diploma. In fact, most Americans matriculate into

post-secondary educational settings. Based on U.S. Census data, Crissey (2009) reported that 85 percent of the population age 25 and over has a high diploma or its general equivalence, while 54 percent attended college. The nationally representative data used in this study produce comparable figures: 87 percent have a high school diploma or a general equivalence degree and 58 percent have attended college.

There is considerable variability surrounding educational attainment patterns, however. Indeed, a number of studies have shown that many youth and young adults diverge from this typical educational pathway in significant ways (Cataldi, Laird, KewalRamani, and Chapman, 2009; Greene and Winters, 2005; Rumberger and Lim, 2008; Sweeten et al., 2009). Not meeting standard educational expectations (e.g., a high school diploma) may have serious repercussions for employment, family, and quality of life throughout the life-course. For decades, theory and research has sought to explain the variability around central tendencies in education attainment because of its broad implications. Researchers and policymakers have concentrated on factors that influence continuity and change in educational trajectories. Continuity is typically studied between stages (e.g., the correlates leading to persisting from high school to college) while change is typically studied within stages (e.g., the correlates of dropping out of high school or college).²¹

²¹ Subtle differences can result in different questions. This study is concerned with variability in educational attainment and factors that inhibit persistence in educational trajectories, which is not necessarily exclusive of dropping out of school.

Research on persistence in and drop out from school is generally organized by secondary and post-secondary educational stages. This is the case because there are fundamental differences between each system. Despite this, both secondary and post-secondary scholarship refers to institutional and individual perspectives that overlap to impact continuity and change in educational trajectories (Rumberger and Lim, 2008; Tinto, 1975). Institutional perspectives concentrate on contextual factors in the lives of students, including family, school, and community influences on student performance. Individual perspectives concentrate on individual factors specific to the student to explain persistence and dropout from school.²² Rumberger and Lim (2008) organized individual-level factors into four domains: *backgrounds, attitudes, performance, and behaviors*.

Background factors include demographic characteristics, physical and mental health, past school experience, and socioeconomic status. While evidence is mixed in terms of gender, those from more disadvantaged groups (e.g., immigrants; African Americans), those with communicative difficulties or mental health problems, and those without preschool experience tend to fare poorer in attaining education (Barnett and Belfield, 2006; Laird et al., 2007; McLeod and Fettes, 2007). Theoretical frameworks of educational persistence and drop out, however, acknowledge that background factors matter, but only to the extent that

²² While there is strong evidence to support institutional perspectives, the framework of this study focuses on the underlying causes of persistence and drop out that are more proximal rather than distal to the individual. See Rumberger and Lim (2008) for an excellent review of the institutional perspective on persistence and dropout from school.

they lead to the intervening mechanisms found in the remaining individual-level domains.

The domain of *attitudes* encompasses the goals, expectations, and psychological factors of students with regard to educational attainment. Collectively, attitudes tap students' educational expectations and motivations to achieve their goals, such as graduating from college. Such attitudes toward school convey strengthened bonds to the institution of education, or an emotional attachment to school (Fredericks et al., 2004; Tinto, 1975). Attitudinal measures, however, have not received entirely consistent support from the literature, which is likely due to the elevated educational aspirations of students (Alexander, 2001; Eccles and Wigfield, 2002; Farkas, 2003; Siennick and Staff, 2008). Therefore, ambitious projections may not positively influence educational attainment, but not having them may foreshadow less successful pathways. As Siennick and Staff (2008) pointed out, it is necessary to distinguish between “dreamers” and “strivers” because youths' aspirations are often inconsistent with their efforts or performance in the classroom.

The *performance* domain consists of achievement in school settings. Achievement is conceived in terms of student ability and demonstrable performance in the classroom. The former is measured using standardized test scores and the latter is measured using grade point averages. Both ability and assignment fulfillment are related to graduating from high school. But as Rumberger and Lim (2008: 19) explained, “grades are a more ‘robust’ measure of academic achievement than test scores” because the former captures motivation

and hard work throughout the year while the latter only provides a temporary snapshot. Good grades and test scores are instrumental not only for matriculation into college, but also for successfully passing coursework and potentially obtaining an advanced degree. A shortage of these characteristics may lead to school failure or (in)voluntarily dropping out, or what Finn (1989) referred to as the “frustration-self-esteem” model.

The *behaviors* domain encompasses a wide range of dynamic factors endogenous to and exogenous from the immediate school setting. Student engagement, the basis for behavioral explanations of persistence in/drop out from school, includes engaging in extracurricular activities such as sports or student government or other non-academic activities (Finn; 1989; Fredericks et al., 2004; Wehlage et al., 1989). Finn (1989) referred to this as the “participation-identification” model, where participating in school activities strengthens educational bonds and helps students identify with the implicit goals of the school. An absence of such ties is indicative of a weakened bond to school, which in turn leads non-participants toward dropping out. Researchers have concentrated on factors leading individuals falling on lower end of the engagement distribution in high school and college.

Students that have been held back or have changed schools, and thus separated from their age, peer, or geographic cohort, tend to leave school at higher rates than those on more stable school and attainment trajectories (Jimerson et al., 2002; Ream, 2005; Stearns et al., 2007). Opportunities for employment and intensive work—exceeding 20 hours weekly, not just part-time employment—

elevates the risk of dropping out, as employed youth and young adults are less likely to be engaged in school, integrated into student organizations, and more likely to be enticed by economic opportunities (Apel et al., 2008; Bean, 1980; Lee and Staff, 2007; Mortimer, 2003). Deviant and problem behaviors, inside and outside of school, decrease the likelihood of completing school. In particular, as law violating behaviors are recognized by higher forms of authority—from school administrators to police arrests to court appearances—the effect on drop out is greater, above and beyond simply engaging in delinquent behaviors (Bernburg and Krohn, 2003; Hirschfield, 2009; Sweeten, 2006). This relationship extends naturally to the context of college settings, as individuals immersed in more deviant lifestyles are less likely to be engaged in school.

Peer networks are also likely to impact educational attainment. The resources and social investments embedded within friendship networks should influence continuity and change in education attainment. Youth and young adults can “cash in” their social capital for assistance with studying or feed off of the viewpoints or outlook of their peer network towards attending college or graduate school (Coleman, 1988; Portes, 1998). Social capital is not created equally, however, which means that some peer networks could negatively impact educational attainment, especially those characterized by deviance. Indeed, several studies have found that associating with deviant peers corresponds with a greater risk of dropping out of school (Battin-Pearson et al., 2000; Kaplan et al., 1997; Ream and Rumberger, 2008). These studies, however, could be capturing individuals projecting their own behaviors on their peers and, as a whole, say very

little about the nature of specific peer groups in relation to educational attainment. More importantly, even less attention has been afforded to a specific deviant peer group that maintains a prominent presence in many schools and communities throughout the United States and abroad—the street gang.

GANG MEMBERSHIP AS AN EDUCATIONAL SNARE

Lives change when people join gangs. What is known empirically about these changes is restricted largely to the context of criminal offending and victimization. This is problematic because it gives the impression that the consequences of joining a gang are confined to criminal domains. It is likely, however, that the impact of gang membership cascades into other significant life domains. As such, it is necessary to adopt a broader conceptualization of the consequences of gang membership to account for its influence beyond the criminal context, particularly for education.

The current study conceptualizes gang membership as a snare in the life-course that negatively disrupts educational trajectories. Moffitt et al. (1996: 404) referred to snares as factors that “diminish the probability of a conventional lifestyle by eliminating opportunities.” The snare-like forces associated with gang membership combine to act as a turning point in the life-course (Melde and Esbensen, 2011; Thornberry et al., 2003). The onset of gang membership is packaged with an overlapping set of disadvantages that are functionally at odds with conventional institutions such education. There are at least three ways in

which the onset of gang membership performs as an educational snare in the life-course.

First, the criminogenic nature of gangs contains costs for educational attainment. With near uniformity, studies have demonstrated that the onset of gang membership corresponds with increases in law violating behaviors, such as drug involvement and violent assaults, and experiencing serious victimization (Krohn and Thornberry, 2008). If this behavior comes to the attention of authorities, it may result in arrest, enhanced supervision, and possibly confinement. The educational attainment literature reports that it is not delinquency *per se* that limits graduation and persistence, but the formal recognition of such behavior by authority figures (Siennick and Staff, 2008; Sweeten, 2006). Not only will an arrest disrupt studies and school-related activities, it will be invariably associated with the labels and stigma linked to the criminal justice system. As it stands, gangs and gang members are the recipients of heightened monitoring not only by law enforcement and correctional authorities, but also within some school systems, where databases document gang membership (Arciaga, Sakamoto, and Jones, 2010; Barrows and Huff, 2009; Brotherton, 1996; Katz and Webb, 2006). Importantly, teachers recognize the bad behavior of gang members (Craig et al., 2004). The deviant mechanisms linked to gang membership—negative peer commitment and anger identity (Melde and Esbensen, 2011)—are at variance with zero tolerance policies in schools, some of which include zero tolerance gang policies. The criminogenic consequences of

gang membership are packaged together and institutionalized in overlapping formal systems to impede educational attainment.

The cultural orientations found within the context of gangs are a second manner in which joining a gang snares educational trajectories. Achievement in school does not usually accompany descriptions of gang members. Part of the reason is that a perfect grade point average or acceptance into a 4-year university does not garner respect from fellow gang members. Miller's (2011) study of gang youths in Boston captured this:

On one occasion a Jr. Bandit [a local gang] announced his intention to enter college and was promptly ridiculed for it by a fellow member. Two weeks later the second boy said that he wanted to go to college, and he in turn was ridiculed by a third gang mate, who, in fact, had previously spoken of continuing his education beyond high school (2011: 488).

School aspirations, then, are private matters not to be publicly valued or promoted among gang peers. Instead, gangs (re)define success in the group context, where the acquisition of respect and status enhancement is earned by way of physical prowess, athleticism, street smarts, wit, and tough banter (Decker and Van Winkle, 1996; Miller, 1958; 2011; Short and Strodbeck, 1965). For gang members, school is social rather than academic. Indeed, several St. Louis gang members reported "We skip classes, roam the halls, look for girls" and "We just hung out and skipped most of the time" (Decker and Van Winkle, 1996: 199). Not only are educational desires constrained, there is a poverty of human capital that is necessary to advance among gang members. While it could be argued that selection processes wholly drive these observations, from a state dependence perspective, gangs are more than simply social spheres that organize individuals

who share criminal characteristics (Nagin and Paternoster, 2000). Indeed, joining a gang impacts attitudes and emotions in non-trivial ways (Melde and Esbensen, 2011); such orientations are at odds with educational attainment.

Finally, gangs socially isolate their members from institutions such as education. Decker and Van Winkle (1996: 187) reported that “gang life has an obsessively deadly attraction for our subjects, one which constricts and diminishes their life to the friendship group of the gang.” As such, gangs do not promote connections to pro-social peer networks, which is problematic for educational attainment for several reasons. While joining a gang may result in an infusion of social capital—access to the gang network and its resources—this movement evolves into deeper gang embeddedness and knifing off from non-gang peers (Decker, Moule, and Pyrooz, 2012; Pyrooz, Sweeten, and Piquero, 2012). As a result, the newly acquired social capital is “lush” for street-oriented goals but “empty” in terms of conventional goals. To be sure, gang activities do not pad resumes and most fellow gang members are not suitable references for legitimate pursuits. Instead, gangs are dense social networks that restrict the flow of conventional information, ideas, and knowledge in favor of criminal alternatives. Street capital and dense networks—i.e., social isolation—work doubly against gang members by limiting ties to pro-social peer networks and masking pro-social opportunities, both of which would likely promote engagement in school. What makes matters worse is that the above processes typically occur at a critical time in the life-course—just prior to transitioning into emerging adulthood—where small disadvantages may snowball into much larger disadvantages.

THE CURRENT STUDY

The social forces associated with joining a gang are hypothesized to act as a snare in the life-course, disrupting educational trajectories at a life stage critical for transitioning to adulthood. Accordingly, it is expected that youth who avoid gangs would accelerate in their educational attainment at rates faster than those entering into gangs. This is the picture that is painted by the qualitative literature (Decker and Van Winkle, 1996; Moore, 1991; Romo and Falbo, 1996; Vigil, 1988; 1999). In one of the few quantitative investigations, Thornberry et al. (2003) argued that high school dropout was among the precocious transitions that gang members experienced. Using panel data gathered from adolescents in Rochester, New York, they found that stable male gang members were more likely to drop out of high school than non-members, but there were no differences for short-term male or female gang members. In explaining life failures in adulthood, again using the Rochester data, Krohn et al. (2011) found that male gang members were more likely to experience precocious transitions, one of which was dropping out of high school.

The current study extends this line of research in important ways. First, nationally representative data are used, which extends the findings outside of limited geographic areas. Second, this study provides a comprehensive assessment of the impact of joining a gang on educational attainment by examining several milestones in educational attainment trajectories. Third, the consequences of gang membership are studied longitudinally and cumulatively, helping to identify both the immediate and long-term effects. Finally, this study

accounts for the non-random nature of gang joining; not doing so could lead to inflated estimates. In summary, this research helps identify the extent, nature, and timing of educational hurdles that are encountered among youth en route to employment and family formation in adulthood.

Dependent Variables

Educational attainment is the primary dependent variable in this study. Educational attainment was recorded in terms of *highest grade completed* in years, ranging from 0 to 20. For example, completing high school would equate to 12 years of education, while completing a baccalaureate degree would equate to 16 years of education. This measure can only increase over time, as respondents rarely experience losses after educational advances. While upward cohort deviations (i.e., skipping a grade) were accounted for between waves, downward cohort deviations (i.e., repeating a grade) would result in no change in the dependent variable. This approach permits the identification of both the growth and stagnation of educational attainment.

Secondary dependent variables include attaining a *general equivalency degree* (GED), *high school diploma*, *post-secondary matriculation*, *2-year college degree*, *4-year college degree*, and *advanced degree*. All six of these outcomes are binary and cumulative. For example, respondents having graduated from high school and entered college during a survey wave would transition from 0 to 1 for both high school diploma and post-secondary matriculation, and they would remain recorded as 1 for both categories thereafter.

RESULTS

Descriptive statistics

Table 5.1 presents the summary statistics for the variables in the study. Beginning with the full sample, respondents are partitioned by a cumulative indicator of gang membership—those who “never” reported gang membership and those who “ever” reported gang membership. About 1 in 12 respondents, or 8 percent of the sample, reported gang membership at least once throughout the study period. The prevalence of gang membership in the NLSY97 takes on added significance because the application of sample weights makes these values nationally representative to persons born between 1980 and 1984. Accordingly, comparisons in educational attainment are made between respondents that joined and avoided gangs in the full sample. For the primary dependent variable, highest grade completed, a full two-year difference in educational attainment is observed. On average, non-gang youth completed 13.6 years of schooling compared to 11.5 years for youth ever in a gang. This translates to the former completing 1.5 years of college and the latter falling 0.5 years short of completing high school.

There is variability in the highest grade completed among the gang and non-gang groups. The secondary dependent variables flush out this variability across key milestones in educational attainment trajectories. As expected, only 50 percent of ever-gang youth graduated from high school, whereas their gang avoiding counterparts graduated at a rate of nearly 80 percent. These differences are large, both statistically and substantively. As discussed above, graduating from high school is an important building block in the normative progression into

Table 5.1. Educational attainment among gang and non-gang respondents

	Full Sample (<i>N</i> =8,984) ^a		Selection Sample (<i>N</i> =7,978)	
	“Non” Gang	“Ever” Gang	W2 Gang Avoider	W2 Gang Joiner
<i>N</i>	8,266	718	7,860	118
%	92%	8%	98.5%	1.5%
Highest grade completed ^b	13.6 (2.8)	11.5 (2.4)	13.4 (2.8)	11.6 (2.3)
GED	9.5%	23.7	10.6	19.5
High school diploma	78.9%	49.6	77.8	53.4
Post-secondary matriculation	60.7%	32.5	58.8	33.9
2-year degree	8.9%	4.6	8.3	4.2
4-year degree	26.7%	5.4	23.5	5.1
Advanced degree	4.2%	0.6	3.5	1.7

Note: ^a Sample weights are applied making the figures nationally representative to persons born between 1980 and 1984.

^b Means and standard deviations (in parenthesis) are reported.

emerging adulthood. Because of this large difference, ever-gang youth were much more likely to have completed a GED—nearly three times the odds. But even after accounting for the GED route, differences remain, as only 73 percent of ever-gang youth have received the equivalence of a high school education compared to 89 percent of non-gang youth. With regard to post-secondary education, non-gang youth continue their education at a rate nearly twice as great as ever-gang youth (60 percent to 32 percent, respectively). This results in over one-quarter of non-gang youth attaining their baccalaureate degree, compared to about 5 percent of ever-gang youth. Of course, the latter finding might be

unexpected given what is broadly known about the consequences of joining a gang. To be sure, a modest number of gang youth end up with 2-year, 4-year, and even advanced degrees, but not nearly at the same rate as respondents who avoided gangs.

The figures from the full sample, however, do not account for the temporal ordering of gang membership and educational attainment. For example, youths could have ceased their education and then joined a gang, resulting in the reverse-causal ordering of the relationship. As a result, the selection sample accounts for this by partitioning respondents into first-time gang joiners at Wave 2 of the study and those that avoided gangs through Wave 2. The sample size is reduced as cases pre-exposed to treatment and cases with treatment item non-response were removed. This procedure results in a precise group of 118 first-time gang joiners, comprising 1.5 percent of the sample. While this procedure results in a low prevalence rate and consists of a relatively small treated sample size, it is worth noting that there are few studies that capture this volume of first-time gang joiners over comparable time period.

Overall differences between those joining and avoiding gangs remain largely intact despite slight changes to the structure of the sample. That is, despite ordering the data to reduce the potential for feedback effects, and consistent with the hypothesized relationship, the magnitude of the differences between gang joiners and avoiders remains. With regard to highest grade completed, gang and non-gang youth completed 11.6 and 13.4 years of education, respectively, compared to 11.5 and 13.6 years in the full sample. The high school graduation

rate is slightly higher in the selection sample for gang youth (53 percent to 50 percent), resulting in a lower GED rate (20 percent to 24 percent). Also, youth who did not join a gang obtained a 4-year degree at a lower rate in the selection sample (24 percent to 27 percent). These changes, however, result in making the educational patterns of gang and non-gang youth *more similar rather than different*, making this an even more conservative test due to the decreasing likelihood of rejecting the null hypothesis. That said, it is premature to conclude that the remaining differences are a direct result of joining a gang. While the selection sample correctly orders the direction of the relationship, it does not account for the endogeneity of gang membership. Without accounting for pre-existing factors that could potentially render the gang membership-educational attainment link spurious, there remains a risk of distorting or overstating the role of gang membership in this relationship. I now turn to the results of the propensity score models to determine whether these relationships endure net of selection into gang membership.

The Cumulative Effects of Gang Joining on Educational Attainment

Table 5.2 displays the results of the propensity score matching models, detailing gang and non-gang differences.²³ Unadjusted differences drawn from

²³ As outlined in Chapter 4, this chapter followed the steps in Apel and Sweeten's (2010a) discussion of propensity score matching (PSM): estimate propensity scores, assess whether the conditional independence assumption is met, and estimate the treatment effect of interest. The goal in this approach is to approximate an experimental research design. Of course, it is not possible to assign gang membership randomly; therefore, PSM attempts to meet specific assumptions making such an approach quasi-experimental. PSM has several appealing features: (1) PSM does not rely on a linear function form to obtain treatment estimates, unlike other approaches, such that outcomes can be modeled non-parametrically; (2) PSM avoids extrapolating treatment effects to

Table 5.1 are recast to highlight the extent to which accounting for selection reduces the relationship between gang joining and educational attainment. The rightmost column of Table 5.2 details the selection-adjusted differences derived from propensity score matching. Several matching algorithms were used to model this relationship, as multiple matching specifications serve to carefully assess the robustness and sensitivity of the findings (Apel and Sweeten, 2010a).²⁴ Estimates from kernel matching using an Epanechnikov estimator are presented.²⁵

The impact of joining a gang on educational attainment equaled -0.66 years of education (95% CI: -1.04, -0.19). This corresponds to over a one-half year difference in educational attainment between those joining gangs compared

cases that are incomparable, detailing the degree to which issues of common support exist in the data; (3) PSM decomposes the average treatment effect (ATE) into average treatment on the treated (ATT) and untreated (ATU). The current study is interested in the ATT due to the research questions: Does gang joining have a negative impact on educational attainment? Taken together, PSM contains several features that are attractive to the current line of research. That said, selection-on-observables strategies are only as good as the data; as demonstrated in Chapter 4, the rich information found in the NSLY97 meets such a challenge.

²⁴ Appendix F details a boundary estimate approach in modeling this relationship, displaying the most and least conservative estimates derived from the following matching estimators: (1) one-to-one nearest neighbor caliper matching, (2) three-to-one nearest neighbor caliper matching, (3) radius matching, (4) kernel matching (Epanechnikov and Gaussian), (5) local linear matching, and (6) five and ten subclass stratification. Each estimator varies in how the “neighborhood” around treated cases is defined and weighted. Varying the construction of the counterfactual—in terms of the number of observations (e.g., from 1 to n) or the weighting parameter (i.e., the bandwidth)—creates a trade-off between bias and variance as the neighborhood expands (Caliendo and Kopeinig, 2005; Smith and Todd, 2005). Neighborhood expansion, while reducing variance, comes at the expense of increasing bias, as more distant observations are allowed to influence the estimate. For nearest neighbor matching approaches, a caliper distance of .01 around the treated case was specified. For kernel matching approaches, a bandwidth parameter of .02 was specified for weighting according to treated case propensity scores. Such specifications keep the neighborhood “tight” and exclusive in terms of influences on the treated cases.

²⁵ The Epanechnikov estimator was used for several reasons, including: it is the default kernel estimator in Leuven and Sianesi’s (2003) `psmatch2` program for Stata; it weights untreated cases within the specified bandwidth, thus operating as a medium between neighbor and kernel approaches; Morgan and Harding (2006) demonstrated that its estimates using the `psmatch2` program in Stata introduced the least amount of bias compared to a host of other approaches (see also Frolich, 2004; Heckman, Ichimura, and Todd 1998; Heckman, Ichimura, Smith, and Todd 1998; Smith and Todd, 2005); it resulted in the greatest reduction in standardized bias, outperforming other matching estimators; and, finally, for the current study, it presented a “middle of the road” estimate between the lower and upper bounds detailed in Appendix F.

Table 5.2. Impact of gang joining on educational attainment (N=7,978)

	Gang to Non-Gang Differences	
	Unadjusted	Adjusted ^a
Highest grade completed ^b	-1.83 *	-0.62 *
GED ^c	8.9 *	-0.9
High school diploma ^c	-24.4 *	-8.5 †
Post-secondary matriculation ^c	-24.9 *	-7.5
2-year degree ^c	-4.1	-1.7
4-year degree ^c	-18.4 *	-6.3 *
Advanced degree ^c	-1.8	0.1

Note: * $p < .05$, † $p < .10$. Differences are expressed in years (highest grade completed) and percentage points (remaining outcomes). Standard errors were bootstrapped with 100 replications.

^a Kernel matching Epanechnikov estimator (bandwidth=.02)

^b In years

^c In percentage points

to those avoiding gangs. This effect reduces considerably from the naïve differences. Based on the unadjusted or maximum possible difference of 1.83 years, the observed adjusted difference reflected a 65 percent reduction. This large reduction indicates that strong selection processes were at work. Despite this, gang membership retains a negative effect over and above selection. Across the eight matching specifications, not one was statistically insignificant. In other words, the weight of the evidence overwhelmingly indicates that the findings observed are attributable to gang joining and not an artifact of selection. To be sure, joining a gang during adolescence has a negative impact on the educational attainment trajectories of youth and emerging adults. While a one-half year difference may at first appear modest, it is important to consider where that

difference is realized in the educational trajectory. On average, gang joiners fell short of completing high school ($M=11.6$) whereas gang avoiders—despite adjusting for selection—completed high school ($M=12.2$); such differences may be numerically small, but substantively large, especially in the context of the hiring requirements of employers.

Where are gang joiners getting ensnared in their educational trajectories? In other words, what educational stage(s) take account for the cumulative one-half year difference in educational attainment between gang joiners and avoiders? To answer this question, the impact of gang joining on several educational milestones was examined at the 11-year mark. Without adjusting for selection into gangs, large differences were observed in graduating from high school, matriculating to college, and earning a 4-year degree. Across all of the educational milestones, selection adjustments reduced the gang to non-gang differences considerably, accounting for about 65-75 percent of the unadjusted differences. Indeed, these relationships changed considerably after controlling for selection processes. College matriculation was notably no longer statistically significant (t -statistic=1.57). Said differently, after accounting for the selection processes associated with gangs, gang joiners are statistically no less likely to attend college than similarly-situated gang avoiders. Yet, statistical differences remained for the outcomes of high school and 4-year college graduation, with 9 and 6 percentage point differences between gang joiners and gang avoiders, respectively. While gang joiners might be able to compensate for the absence of a high school diploma by pursuing a GED to make it to college, they are having greater

difficulty earning a 4-year degree compared to their gang avoiding counterparts. In summary, it appears that the divergence in cumulative educational attainment between gang joining and gang avoiding is most likely to be observed at the high school and 4-year college graduation stages.

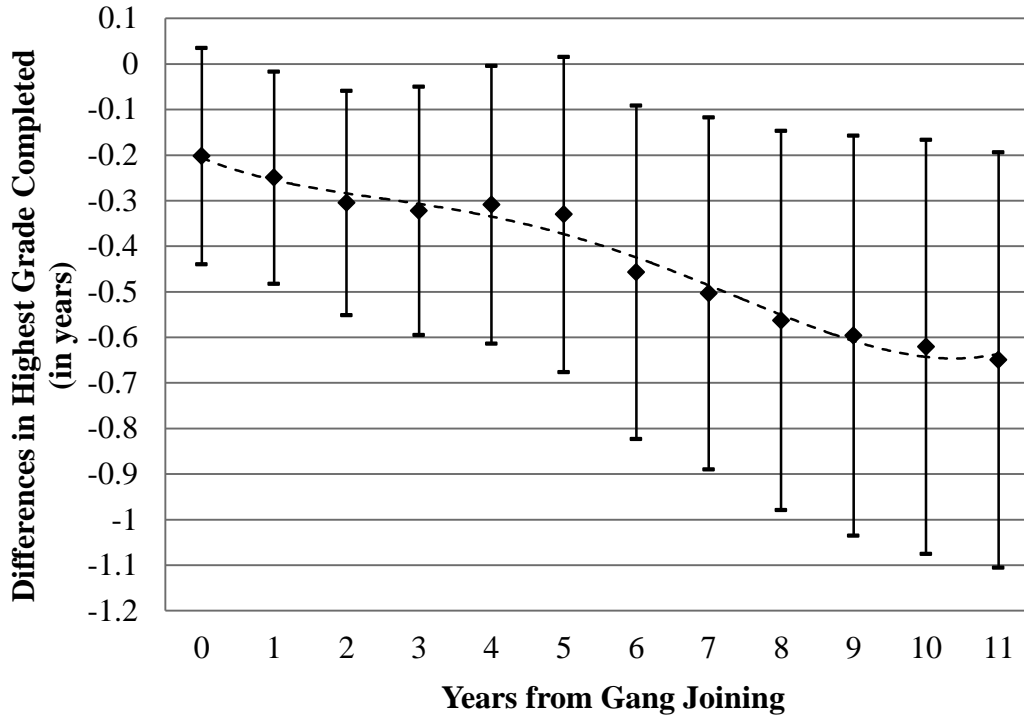
The Longitudinal Effects of Gang Joining on Educational Attainment

The findings presented above are based on the educational histories of respondents 11 years after gang joining. Such accounts have the potential to blur the time-varying nature of the educational consequences of gang membership. An 11-year retrospective account of educational attainment may conjure a too simple depiction of the differences gang joiners and avoiders, especially if gang joiners are able to overcome the snares of gang membership.

Figure 5.1 presents the results of the longitudinal effects of gang joining on educational attainment.²⁶ Gang joining is observed to have an early impact on educational attainment, which is not unexpected given what is known about the

²⁶ The primary outcome in this study, highest grade completed, was less susceptible to missing data because respondents did not increase their educational attainment considerably over the latter half of the study. Gang joiners and avoiders gained only .22 and .44 years after wave 6, respectively. This means that missing one or even two waves would not have a major impact on the outcome because of later wave corrections. Longitudinal analyses using a propensity score matching strategy are more susceptible to missing data constraints than, say, multi-level approaches. On a wave-by-wave basis gang and non-gang respondents maintained a pooled item/case non-response rate between 10 and 18 percent, respectively, from waves 6 forward. Between waves 2 and 13, a total of 11,151 out of 94,536 cells contained missing information for grades completed in years. A multiple imputation strategy in Stata 12.0 was used—*mi impute*—to deal with missing information. MI is a simulation-based approach producing $M=20$ imputations derived from an mvn imputation model using impute registered outcomes and regular registered variables (e.g., demographics, gang joining). MI is a well-established approach for handling missing data (Allison, 2001; Rubin, 1987; 1996). In comparing imputation and non-imputation longitudinal models, naturally, the prevalence of missing data was positively (non-imputation) and inversely (imputation) related to the size standard errors. With one exception (Wave 12), no differences larger than .03 were observed and the non-imputation tended to slightly increase the

Figure 5.1. Impact of gang membership on highest grade completed over 12 years



Note: Estimates were derived non-parametrically using kernel matching with Epanechnikov estimators (bandwidth=.02). Diamonds represent the point estimates of the average treatment effect on the treated (ATT). Vertical lines are the 95 percent confidence intervals derived from standard errors bootstrapped with 100 replications.

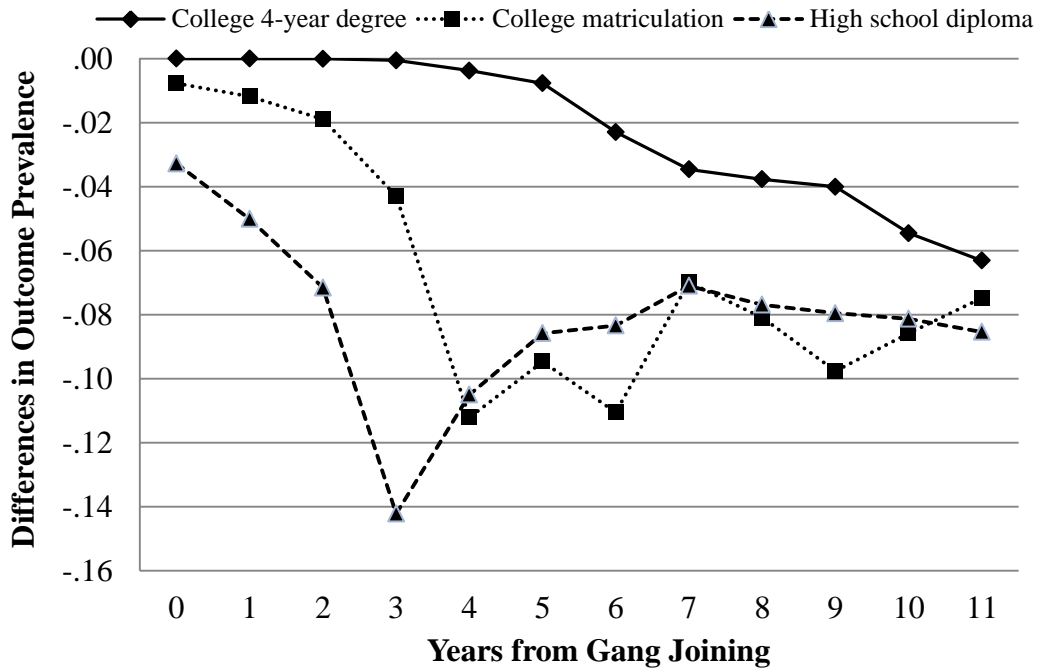
immediate consequences associated with the onset of gang membership. At the time of treatment, the difference was not statistically significant, but within one year, gang joiners were already a quarter-year behind their selection-adjusted counterparts. It is important to note that grade attainment (and age) was included in the selection model, and after matching, there were no standardized differences (pre-matching: $d=22$, $t=2.27$; post-matching: $d=7$; $t=0.55$). This effect accumulates slightly over the two years subsequent to gang joining, leveling off at about 0.30 until year five, then steadily declining until the conclusion of the study

effect of gang membership. All of the estimates were derived non-parametrically using Kernel Matching with Epanechnikov estimators.

period, where a 0.65 year difference is observed. The results of the longitudinal models indicate that joining a gang is an accumulative disadvantage for educational attainment. To be sure, joining a gang has long lasting effects on educational attainment that do not diminish over a 12-year period.

Figure 5.2 helps identify the time-varying emergence of educational attainment differences by exploring the effects of gang joining on the educational milestones of high school diploma, post-secondary matriculation, and 4-year degree. All three of the outcomes differed statistically at least once over the 12-year period. High school graduation is an obstacle for gang joiners, jumping from 3 to 5 to 7 and then peaking at a 14 percentage point difference at 0, 1, 2 and 3 years, respectively, after joining a gang. After that point, however, gang joiners “recover” in the form of earning their high school diploma, although a 9-percentage point difference remains 11 years later. The impact of gang joining on college matriculation operates similar to earning a high school diploma, although with a one-year time lag. Statistical differences were observed between 4 and 6 years after treatment, but gang joiners were eventually able to catch up and matriculate into college settings. The route to college, however, was not dictated by high school graduation. Gang joiners achieving a GED went to college at twice the rate (40 percent) of their gang avoiding counterparts (20 percent). Despite gains in educational attainment, gang joiners continued to experience negative wave-by-wave differences in earning a 4-year college degree. This could be attributed to gang joiners dropping out of college, but the trend could also tail off

Figure 5.2. Impact of gang membership on graduating from high school, matriculating to college, and earning a four-year degree over 12 years



Note: Point estimates are average treatment effects on the treated using Kernel matching with Epanechnikov estimators (bandwidth=.01).

as gang joiners navigate through their coursework and earn the credits and units necessary to graduate.

In summary, joining a gang has a negative impact on educational attainment. This impact appears to be long lasting and cumulative, intensifying over time. The educational consequences are the largest within three to four years after joining a gang. But as people sort themselves out educationally, advancing to college and earning their degrees, it appears that gang members experience greater difficulty in moving forward. It is worth noting that treatment occurred between 1998 and 1999, and the outcomes were observed annually thereafter until 2009. Of course, non-joiners could have joined a gang between 2000 and 2009,

thereby making these findings conservative assuming that the treatment effect is invariant across the adolescent life-course. Nevertheless, the consequences of gang joining are not limited solely to criminal outcomes, as this chapter has demonstrated that it acts as an educational snare in the life-course. The following chapter extends this line of questioning to the context of employment. Given the strong link between educational attainment and employment, the above results do not paint an optimistic picture for the investigation undertaken in the following chapter.

Chapter 6

THE IMPACT OF ADOLESCENT

GANG MEMBERSHIP ON EMPLOYMENT

Labor market changes over the last several decades have been particularly devastating for people in socially and economically disadvantaged neighborhoods (Wilson, 1987; 2009). Youth and young adults in such neighborhoods are subject to spatial and skill mismatches that have relegated them to secondary sector employment—“jobs with low wages, poor work conditions, and, most importantly, job instability” (Crutchfield, Matsueda, and Drakulich, 2006: 201; Crutchfield, 1989; Piore, 1970). Meeting market demands for a highly educated and trained workforce are pathways to primary sector occupations, but inner-city adolescents face the burden of underperforming schools, struggling familial networks, weakened social controls, economic hardships, and an alluring and dangerous street culture (Anderson, 1999; Fagan and Wilkinson, 1998; Miller, 2008; Sampson, Morenoff, and Gannon-Rowley., 2002). Street gangs are highly embedded in these communities, playing a prominent role in schools, neighborhoods, and culture. While street gangs may be a product of economic and social disadvantage and weakened systemic networks, they also contribute to the social ills of such communities (Bursik and Grasmick, 1993; Katz and Schnebly, 2011; Pyrooz, Fox, and Decker, 2010; Tita et al., 2005; Tita and Ridgeway, 2007). Most youth in these communities avoid gangs, but the short-term deleterious consequences of gang membership on criminal involvement and

personal victimization are well-documented among those that join gangs (Krohn and Thornberry, 2008).

There is reason to believe, however, that there are broader consequences associated with joining a gang. It is expected that the consequences of joining a gang will (1) cascade outside of the domain criminal involvement and into other significant life domains such as employment and (2) reverberate years after joining (and even leaving) a gang because of the snare-like processes that impact positive development during periods of gang membership. The processes associated with gang membership—criminal involvement, heightened police surveillance, social isolation and capital stagnation—are incongruent with healthy functioning within the institutions of family, education, and, most importantly, employment. Indeed, arrest records, social stigma, limited conventional peer networks, and age cohort deviations in human capital accumulate and pose serious challenges to employment opportunities and stability. Gang membership impacts lives in significant ways, and the consequences of joining a gang are likely to extend into the workplace for years to come.

To date, the role that gang membership plays in contributing to poor employment circumstances is empirically unclear. The work histories of current and former gang members in emerging and early adulthood have been described in several studies as troubling (Decker and Van Winkle, 1996; Hagedorn, 1998; Horowitz, 1983; Krohn et al., 2011; Levitt and Venkatesh, 2001a; Moore, 1991; Thornberry et al., 2003; Vigil, 2002). Indeed, these studies have shown that the work histories of individuals with a history of gang membership are generally

consistent with secondary sector occupations—unstable, low-wage, unrewarding, and supplemented with illegal income sources. Questions remain, however, about whether these findings extend to other geographic regions and whether selection into gangs partially (or wholly) accounts for the observed relationships. In other words, in the presence of overlapping sets risk factors, are there non-trivial differences between gang and non-gang youth in their employment lives as they transition into adulthood? For theory and policy, the implications of these findings are not inconsequential. Disentangling selection effects from empirical findings helps clarify debates in life-course criminology surrounding continuity in problem behaviors and the relevance of life states (Nagin and Paternoster, 2000).

Offsetting the effects of gang membership in schools and communities is a central priority for practitioners and policymakers, and factors inhibiting employment are important to reconcile for the purposes of facilitating desistance from crime (Esbensen, Peterson, Taylor, and Osgood, 2012; Klein and Maxson, 2006; Laub and Sampson, 2003).

This chapter examines the impact of gang joining on the patterns and nature of employment. Data from the NLSY97 were used to compare differences in the work histories (labor supply and job quality) of gang joining and gang avoiding youth. Beginning in 1998, when selection into gangs was modeled, respondents were surveyed annually over a 12-year period with regard to their work histories. Growth curve modeling was used to evaluate the effects of adolescent gang joining on within-individual averages and slopes of employment outcomes conditional on the propensity to join a gang. That is, do gang joiners

differ in their work histories from those that avoid gangs? And, do gang joiners differ in the rate at which their work histories evolve over time? The longitudinal nature of the data is well-suited to examine if, and how, the consequences of gang joining emerge over time. Moreover, outcomes are examined leading up to the “Great Recession,” where the final wave of data were collected in 2009.

Importantly, this research provides a glimpse into the relevance of risky adolescent states as young adults settle into their careers and exercise greater control over their lives in tumultuous economic times.

THEORETICAL FRAMEWORK

A central component of Wilson’s (1987) underclass thesis held that changes in the structure of the labor market disproportionately affected those from socially and economically disadvantaged demographic groups. The transition from a manufacturing to service oriented economy brought about social dislocations in urban America beginning in the mid-twentieth century. Such changes worked doubly against residents in areas characterized by concentrated disadvantage due to spatial and skill mismatches associated with employability. Demand for low-skilled or blue collar labor in urban centers waned or migrated to the suburbs, only to be replaced by a market centered on information processing that required a skilled and educated workforce. Unlike previous generations, the under-educated and under-trained were shut out of primary sector occupations, instead limited to employment opportunities in the secondary sector, which are less stable, offer fewer advancement opportunities, and consist of poor working

conditions and wages (Crutchfield, 1989). More importantly, as Crutchfield, Matsueda, and Drakulich (2006: 202) pointed out, “. . . once a worker is relegated to a secondary sector market, it is very difficult to move out.” Of course, not all residents of socioeconomically deprived neighborhoods—especially youth—are confined to the secondary sector market (Elliott et al., 2006), as education and other training programs are pathways to better wages and stable employment.

Various structural and cultural factors, however, impede trajectories leading to primary sector employment (Wilson, 2009). Over the last three decades, the road to adulthood has lengthened, where higher education is now a normative component of the path to a “real” job and family formation (Arnett, 2004; Bynner, 2005; Osgood et al., 2005). As structural and cultural changes delay movement into formal employment positions, emerging adults are increasingly at risk of getting ensnared in dangerous contexts that involve alcohol or drugs, homelessness, or violence (Aldridge et al., 2011; Hagan and McCarthy, 2004; Smith et al., 2011). Even prior to entering the life phase that constitutes emerging adulthood, many youths are subject to underperforming or disadvantaged schools, physically or emotionally absent parents, or other high-risk environments that decrease the chances for attending college and, thus, competing in the contemporary job market (Harding, 2003; Rumberger and Lim, 2008; Sandefur et al., 2006). In addition, cultural elements of racially and economically segregated neighborhoods further constrict employment chances of young men and women. Specifically, street culture is a functional property in such neighborhoods, dictating the behaviors and motivations—especially for status and

respect—of individuals exposed to the “codes of the street” (Anderson 1999; Matsueda et al., 2006; Stewart and Simons, 2010). As Anderson (1999) has detailed, as well as others (Fagan and Wilkinson, 1998; Katz, 1988; Luckenbill, 1977), those who adopt these codes maintain a heightened sensitivity to perceived incidents of disrespect and resolve their disputes informally, often with physical force. These codes are at variance with the expected attitudes and activities of youth and young adults in pursuit of primary sector employment.

As durable, street-oriented collectives, gangs are visible cultural byproducts of aggregate forms of social and economic disadvantage. Indeed, several studies have found that gangs tend to be concentrated within and around the neighborhoods and communities with the greatest disadvantages (Katz and Schnebly, 2011; Pyrooz et al., 2010; Tita et al., 2005). There are well-documented consequences for those who join gangs, as group processes within the gang exert considerable influence on constituent members. Thornberry et al. (2003) and Melde and Esbenson (2011) demonstrated that gang membership acts as a turning point in the life-course. One of the central features of the life-course framework is that past experiences—life events and states—shape future activities and opportunities, such that small disadvantages can snowball into larger disadvantages (Elder and Giele, 2009; O’Rand, 2009). There are several reasons to expect that the turning point significance of joining a gang will have consequences that, all else equal, extend into the domain of employment and accumulate over time, especially in light of structural shifts in the labor market.

Gang membership increases the levels and varieties of criminal offending, especially violence (Krohn and Thornberry, 2008; Melde and Esbensen, 2012). Criminal careers research has demonstrated that the probability of police contacts or court referrals increases with offending frequency (Brame et al., 2004; Dunford and Elliot, 1984; Farrington et al., 2003). The police monitor gangs and gang members at higher rates than most other groups or individuals, a fact that is demonstrated by specialized gang units throughout police departments in the United States (Katz and Webb, 2006). The result of elevated offending levels and additional police surveillance is that gang members are more likely to be arrested for their illegal behaviors and incarcerated for the seriousness of their offenses. Legislative action over the last three decades has severely increased the penalty for gang-oriented crimes (Fearn, Decker, and Curry, 2006; Klein and Maxson, 2006), often consisting of sentence enhancements resulting in extended periods of confinement. When in search of a good job, gang members—whether current or former—will be presented with serious challenges as a result of the increased chances that their criminal behavior will have been recognized formally by the criminal justice system. Indeed, Tapia (2011) found that gang membership increased the risk of arrest. There is a strong chance that background checks will reveal an arrest that might consist of a felony, which additionally shuts out gang members from various sectors in the primary market (Pager, 2003).

As was shown in the previous chapter for educational attainment, gang membership acts as a snare in the life-course, suspending the accumulation of conventional social and human capital that is so critical in the contemporary job

market (Decker, Moule, and Pyrooz, 2012; Krohn et al., 2011). The onset of gang membership might result in an infusion of (“bad”) social capital, extending one’s social network and expendable resources. Eventually, though, gang processes siphon off non-gang relationships and conventional forms of information (Decker and Van Winkle, 1996; Klein and Maxson, 2006; Pyrooz et al., 2012; Short and Strodtbeck, 1965). Typically, gangs do not promote ties to individuals outside of the gang and rarely to social institutions, including the education system, where school is overwhelmingly social as opposed to educational. In addition, as discussed above, street culture is perhaps best exemplified in the gang context, where status and respect are monolithic. Such factors leave gang joiners ill-equipped for primary market sector employment, which impacts individuals regardless of whether they persist or terminate their gang involvement in emerging adulthood. Personal and extended networks play an important role in facilitating the acquisition of new employment (Granovetter, 1983). Persistent gang members are at a severe disadvantage, as their fellow gang members are unlikely sources of such access and information. For former gang members, considerable effort must be afforded to repairing or recreating lost social capital and reattempting human capital formation that has left such individuals in the shadow of their age-cohort. Social isolation, constricted personal networks, and stalled gains in human capital are forces gang joiners need to offset should they seek out employment that carries the benefits of stability and competitive wages.

Economic, social, and policy shifts over the last several decades have combined to pose new challenges to job seekers. Substantial changes in criminal

justice practice and policy have corresponded higher rates of arrest and incarceration (Brame et al., 2011; Bynner, 2005), which in turn have corresponded with employment restrictions surrounding criminal records. Severe stigma did not accompany the “gang boys” of yesterday compared to the sensationalized and violent popular image of contemporary gangs. Further, the formal consequences associated with gang membership and gang behaviors were nonexistent. More importantly, there were clear avenues out of “street life” and into good jobs for marginalized and gang youth. But as Wilson (1987; 2009) and others have described, the labor market was not bifurcated into primary and secondary sector employment. In fact, several researchers (Hagedorn, 1998; Moore, 1991; Vigil, 2002) have pointed to the absence of manufacturing jobs and shifts in the labor structure as chiefly responsible for the gang milieu in urban America. As such, it would be expected that more contemporary gang joiners would not enjoy comparable employment circumstances to the gang members of previous generations or to their contemporary gang avoiding counterparts.

EXISTING RESEARCH

Several studies report various aspects—both illicit and conventional—of the economic and employment activities of gangs and gang members. Interest in these activities tends to concentrate on illicit revenue generation, particularly drug distribution, due to the criminal involvement of gangs. The increasingly violent drug markets of the 1980s were a catalyst for investigating the gangs-drugs link (Decker, Bynum, and Weisel, 1998; Fagan, 1989; Hagedorn, 1994; Howell and

Decker, 1999). For example, Levitt and Venkatesh (2000) examined the financial records of a drug-dealing gang in Chicago and found highly skewed economic returns to gang members according to the social hierarchy of the gang. After assumptions about “off-book” transactions, hours worked per week and tributes to central leadership, the hourly wages for lower level gang members and gang leaders ranged between \$2-7 and \$32-97 over the four years of observation. These wages were a premium compared to what gang members’ qualifications would warrant in legitimate sectors. Still, most lower-level gang members were also working in fast food restaurants or in small businesses.

Decker and Van Winkle (1996) also found that while the majority of the gang members they interviewed in St. Louis sold drugs, 17 percent were also employed in the legitimate labor market. Similar to Levitt and Venkatesh’s (2000) findings, gang members were employed primarily in the service or retail industry, working as janitors, cooks, cashiers, or at amusement parks. The youthfulness of the sample and attending school was a primary reason for joblessness, but most respondents reported that they would rather hang out with the gang than work. Rather than earn minimum wage income in a formal setting that required “soft skills” when interacting with customers, gang members could sell drugs as individual entrepreneurs and hang out with their friends. Indeed, gang processes are at odds with legitimate employment:

It isn’t only earnings that places the legitimate job market at a competitive disadvantage with selling drugs, it is the nature of work, with its requirements of structure and discipline, that conflict with the values of life in the gang (Decker and Van Winkle: 224).

Decker and Van Winkle reported several instances where gang members quit their job because they disliked being told what to do. Additionally, the migration of manufacturing and even retail and service industries to the suburbs of metropolitan St. Louis made securing legitimate employment even more difficult due to commuting and disrupted contact networks.

As adolescent gang members enter adulthood, securing income becomes a higher priority as they seek personal independence and family formation. Several studies outline how current and former gang members navigate between legitimate and illicit sources of income in their early adult years (Horowitz, 1983; Moore, 1991; Sanchez-Jankowski, 1991; Vigil, 1988). Horowitz emphasized that subjects in her study sought independence in their pursuit of employment. They recognized that good jobs were hard to come by and supplemented their income by stealing and drug dealing and neutralizing their behaviors by contending that it supports their family or that they are pursuing the American dream. Sanchez-Jankowski reported that while many gang members move on to other criminal enterprises, are incarcerated, or experience violent or drug-related deaths, most transition into conventional forms of employment. He referred to this as the “social death” that gang members feared and avoided—a dead-end job comparable to their parents’ (315).

Moore (1991) detailed the employment lives of individuals from two generations of two of Los Angeles’ most longstanding Hispanic gangs.²⁷ She

²⁷ Moore studied early and recent cliques of the White Fence and Hoyo Maravilla gangs. Early and recent cliques were distinguished according to whether they emerged before or after 1958. Moore reported that the cutpoint was chosen “arbitrarily as a useful halfway mark,” but all “pre” cliques

followed up on the gangs 10 years after her original observations, examining the adult lives of current and former gang members. Moore reported that “squares,” or individuals living conventional lifestyles consisting of steady employment and little criminal involvement, were the modal category among her sample. Around one-third of the sample worked in semiskilled factory jobs, nearly 40 percent held union jobs, and approximately 15 percent held skilled or semiprofessional jobs. Moore’s subjects relied heavily on personal connections to secure employment—60 percent reported friends or relatives helped them get jobs. That said, as many as one-third of males received government assistance in the previous five years and between 15 and 25 percent of respondents secured income from illicit activities.

Most importantly, Moore (1991) reported that life was different for the younger generation of gang members because of macroeconomic restructuring. She noted that individuals from recent cliques had greater trouble in securing employment. Men from earlier cliques were more likely to work than men from recent cliques (61 vs. 44 percent, respectively), whereas women from earlier cliques were less likely to work than women from recent cliques (48 vs. 61 percent, respectively). While some of these differences might be attributed to the increasing presence of females in the workplace, Wilson (2009) pointed out that women have less trouble finding employment in the service-oriented marketplace.

Moore commented:

originated between 1944 and 1950 and all of the “post” cliques originated between 1964 and 1972. This permitted Moore to comment on economic deindustrialization in Los Angeles and how it affected each clique differently.

Economic restructuring has taken “good” jobs away from East Los Angeles, and replaced them with exploitative jobs—unstable, low-wage, and unsheltered. Kin-based job networks that found decent work for earlier cliques members deteriorated. Young adult gang men find themselves competing with immigrants (1991: 133).

The inability to find employment in turn created a greater reliance on the gang, resulting in a street culture that was not present for the prior generation of East Los Angeles gang members.

Levitt and Venkatesh (2001a) followed up one decade later on the economic lives of a sample of 29 gang members and 61 non-gang respondents who lived in a Chicago housing project 1991. While their bivariate findings indicated that gang members completed less education, had lower annual legal income, and had greater annual illegal income than non-gang respondents, their multivariate analyses revealed only indirect relationships operating through education and incarceration.

Thornberry et al. (2003) and Krohn et al. (2011) extended this line of questioning using panel data from middle school youth in Rochester, NY public schools living in high offending areas. Thornberry et al. (2003) argued that unstable employment was among the precocious or off-time transitions that adolescent gang membership would lead to in early adulthood. Respondents that did not have a job for the majority of months between ages 19 and 21 were classified as experiencing unstable employment. Female and multi-year male gang members were two and nearly three times more likely to report unstable employment, respectively, relative to their non-gang counterparts, and yet no differences were observed between short-term gang and non-gang respondents.

Krohn et al. (2011) extended this research to early adulthood, proposing a three-stage pathway between adolescent gang membership, precocious transitions, and economic hardship between ages 29 and 31. Using structural equation modeling, they found that adolescent gang membership led to increases in a construct of precocious transitions, which in turn led to greater economic hardship, in the form of unemployment and annual income.

Collectively, these studies paint a somber picture of the nature and patterns of employment among current and former gang members. The Rochester studies lend the most credibility to the argument that gang membership impacted employment outcomes, as the research design contained a control group and systematic observation. Yet, the above research motivates a more comprehensive inquiry into the effects of gang membership on employment. As it stands, typically only one or two aspects of employment is examined, which constrains our understanding of the problem. Also, outcomes are examined at narrow cross-sections in time, providing a brief glimpse rather than a broad picture of the nature and patterns of employment during an evolving phase of the life-course. Finally, propensity theorists could argue that the above findings are driven wholly by selection into gang membership, thereby discounting its relevance in the broader scheme of the life-course in relation to employment. In summary, then, while prior research has advanced our understanding of the adult employment lives of adolescent gang joiners, it is less clear empirically to what extent, if any, gang membership plays in dictating poor employment circumstances.

THE CURRENT STUDY

The current study extends the extant literature on the effects of gang membership on employment outcomes in several ways. First, this study focuses on a range of employment outcomes pertaining to work history—labor supply and job quality—which provides a comprehensive assessment of the consequences of gang joining, rather than a narrower focus on one or two employment outcomes. Second, by using a nationally representative dataset the findings are not restricted to one geographical region or one high-risk group of individuals. Third, longitudinal modeling is used to examine the emerging effects of gang joining, as youth are observed systematically from their teenage years until their mid- to late-twenties. Importantly, this approach can account for the dynamic nature of employment in late adolescence and early adulthood. Fourth, and perhaps most importantly, this study accounts for non-random selection into gangs in order to isolate the effects of gang joining on employment outcomes and contend with alternative explanations.

Dependent Variables

Self-report information related to labor supply and job quality was explored on a yearly basis between 1998 to 2009 in the NLSY97 (see Apel and Sweeten, 2010b, for a similar measurement scheme). Labor supply outcomes pertain to employment status. Event history data in the NLSY97 capture spells of employment status on a weekly basis beginning at age 14. This information consists of three mutually exclusive categories pertaining to whether respondents

were employed, unemployed, or out of the labor force each week. Employed includes jobs as employee and self-employment. Unemployed and out of the labor force distinguish respondents who are without jobs and seeking employment from those not participating in the labor force. This approach avoids confounding periods of active job seeking with periods of being outside of the labor force entirely. Information was then pooled into yearly segments to construct two sets of variables for being *employed*, *unemployed*, or *non-participation*: (1) for at least one week throughout the year, and (2) the percent of weeks throughout the year. The former is not mutually exclusive and captures experiencing any of the outcomes, while the latter taps the breadth of the respective employment experiences on a yearly basis.²⁸

Job quality outcomes include *annual income*, *average weekly hours worked*, and *hourly rate of pay*. Annual income includes all sources of legal income received from employee-type jobs and self-employment over the previous year (and prior to deductions and taxes). In the instance where respondents were unsure or refused to provide this information, they were asked to provide an estimate based on a card containing values ranges of income (e.g., \$25,000-50,000), which was then incorporated through mean adjustment. Annual income was capped at \$150,000. Average hours worked was derived from the employment event history weekly data. Hours worked were summed across jobs and then averaged across the total weeks of available information. Hourly rate of

²⁸ Despite pooling information, percent weeks does not result in 100 percent of weeks accounted for because of missing data. While the Bureau of Labor Statistics sought to account for weekly employment information in the instance where a respondent was interviewed after missing a wave, some missing information persists (although at a very low rate).

pay was generated as an average across jobs based on reported pay, rate of pay per time unit (e.g., hourly, monthly), and hours worked, which could result in wide fluctuations across respondent. Hourly rate of pay was capped at \$500, as very few individuals exceeded this amount. All of the job quality variables apply only in the instance where the respondent was employed.

RESULTS

Descriptive Statistics

Table 6.1 presents the summary statistics for the sample on the variables examined in the study. Beginning with the full sample, where nationally representative weights are applied, respondents were partitioned by whether or not they had a history of gang membership. The figures presented are grand values, which represent the means and standard deviations pooled across person-periods. Those reporting gang membership differ from those avoiding gangs across every category of employment. Throughout the study, gang members were employed at a rate of 7 percentage points lower, unemployed at a rate of nearly 10 percentage points higher, and labor force non-participants at a rate of about 6 percentage points higher than those who avoided gangs throughout the study. Of course, employment accounts for whether these outcomes occurred *anytime* throughout a year. As such, there is considerable overlap because respondents could be employed, unemployed, and out of the labor force in the same year.

Table 6.1. Employment descriptive statistics among gang and non-gang respondents

	<u>Full Sample^a</u>		<u>Selection Sample</u>		
	“Non” Gang	“Ever” Gang	W2 gang avoider	W2 gang joiner	
	<i>N</i>	8,266	718	7,860	118
	%	92%	8%	98.5%	1.5%
In the last year, at least one week . . .					
Employed		84.2%	78.5*	82.6	76.7*
Unemployed		28.5%	38.0*	30.1	38.6*
Non-participation		52.2%	58.7*	53.9	62.1*
In the last year, percent of weeks . . .					
Employed		65.5 (39.2)	56.5 (40.0)*	63.3 (40.0)	54.3 (41.3)*
Unemployed		5.3 (20.0)	9.4 (14.5)*	6.1 (15.9)	9.9 (21.0)*
Non-participation		24.5 (35.0)	29.7 (37.6)*	26.0 (35.9)	31.8 (38.1)*
In the last year, across jobs . . .					
Annual income (\$, thousands)		15.0 (16.7)	14.1 (14.5)*	14.6 (16.1)	13.6 (14.2)†
Average hours worked weekly		34.8 (15.0)	38.4 (16.2)*	35.1 (14.8)	36.8 (15.4)*
Hourly rate of pay (\$)		11.7 (22.5)	12.9 (31.4)*	11.5 (22.3)	12.8 (27.2)†
	<i>N</i>		8,984		7,978
	<i>NT</i>		101,048		91,186

* $p < .05$, † $p < .10$; *N*=persons, *NT*=person periods

Note: Grand means and standard deviations (in parenthesis) are reported, based on 12 waves of information.

^a Sample weights are applied making the figures nationally representative to persons born between 1980 and 1984.

Similar to employment status, gang members spent a lower percentage of weeks employed, and a higher percentage unemployed or out of the labor force. Over the 12-year period, there was a 9 percentage point difference in employment—66 percent compared to 57 percent, respectively—between gang and non-gang respondents. That difference is decomposed into 4 and 5 percentage points of additional weeks spent unemployed and out of the labor force,

respectively. While these values appear modest in magnitude, they are substantively large, especially over a 12-year period. For example, differential patterns of employment between gang and non-gang respondents translate into a 52-week disparity over the period of observation. To be sure, *individuals with a history of gang membership spend one more entire year unemployed or out of the labor force in late adolescence and emerging adulthood compared to their non-gang counterparts*. With regard to job quality outcomes, the gang subset of the sample earned about \$1,000 less than the non-gang subset in annual income. This occurred despite the fact that the former averaged over three additional hours of weekly work and roughly \$1.00 more in hourly rate of pay than the latter. Yet, the difference in annual income should come as no surprise, despite hours worked weekly and hourly wages, given the patterns of employment among gang members presented above.

Very similar patterns emerge when turning to the selection sample. The signs, directions, and magnitudes of the differences are comparable to the full sample, although there appears to be a slight downward push—equal for gang and non-gang respondents—for employment variables. While these values are no longer nationally representative and the differences apply to wave 2 first-time gang joiners, they correctly order the temporal relationship between gang membership and the outcome variables. In the full sample, respondents could have experienced unstable employment for several years and then joined a gang, resulting in the reverse-ordering of the theoretical relationship (this is unlikely, given the age range of the sample—around ages 12-17—at treatment). While this

could also be true in the selection sample, the differences are no longer naïve because they account for selection into gang membership and alternative explanations of the relationships. Without taking such factors into account, at minimum, the effects of gang membership could be overstated; at maximum, such factors could potentially render these relationships spurious. Nevertheless, these findings suggest that, across a 12-year pooled cross-section, there are differences that are large in magnitude in the employment lives of individuals with a history of gang membership.

The Effects of Gang Joining on Binary Labor Supply Outcomes

Table 6.2 reports the results of the random-effects models predicting the effects of gang joining on labor supply outcomes—whether or not respondents were employed, unemployed, or labor force non-participants over the course of a year. Two sets of results are presented for each outcome: The left-hand column of the table contains the effects of gang joining without selection adjustment and the right-hand column contains the effects of gang joining conditional on selection into gangs. Both sets of models also test whether gang joiners experience differential rates of change in their employment status across the period of observation. Because it was constructed to represent the midpoint observation, the intercept coefficient signifies the average marginal effect of treatment (i.e., gang joining) 5 years later. For the key explanatory variable, gang joining, the average marginal effects are presented on a yearly basis to better detail the temporal and cumulative nature of the consequences of gang joining.

Without accounting for selection, compared to those that avoid gangs, gang members are less likely to be employed and more likely to be unemployed and out of the labor force within three years or less after the event of joining a gang. For employment, the negative coefficient for the time*gang interaction ($b=-.158, p<.05$) indicates that gains in pathways to employment occurred at a differential rate over time for gang joiners. No slope differences emerged for unemployment and labor force non-participation patterns, which indicates stable differences between gang and non-gang respondents over time. The average marginal effects illustrate these differences. One year after joining a gang, there were no statistically significant differences in employment ($b=-.057, p>.10$); 11 years later, that difference increased in magnitude by a factor of over 30 and was statistically significant ($b=-1.80, p<.05$). Of course, given the logit link function and the changing base rate of employment, gains in magnitude over the last several years do not represent substantively significant differences in the effect sizes (e.g., differences in the range of 1 to 3 percentage points). The coefficients for unemployment and out of the labor force revealed similar patterns, where gang joiners experienced slower gains over time. These findings confirm the bivariate differences in grand means between gang joiners and avoiders presented above, but, importantly, provide additional evidence that the employment status pathways are even less steady and less successful for gang joiners over time.

After controlling for observed sources of population heterogeneity, the effects of gang joining on the employment status outcomes attenuate considerably. Across all of the outcomes, selection controls reduced the gang

Table 6.2. Random-effects maximum likelihood estimates for binary labor supply outcomes

	<u>Employed</u>		<u>Unemployed</u>		<u>Non-participation</u>	
	No selection controls	Selection controls	No selection controls	Selection controls	No selection controls	Selection controls
	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)
<i>Growth Components</i>						
Linear	0.461 (.010)*	0.477 (.011)*	-0.109 (.004)*	-0.115 (.004)*	-0.262 (.005)*	-0.265 (.005)*
Quadratic	-0.043 (.001)*	-0.043 (.001)*	-0.017 (.001)*	-0.017 (.001)*	-	-
<i>Average Marginal Gang Effects</i>						
Year 1	-0.216 (.244)	-0.026 (.250)	0.386 (.138)*	0.189 (.141)	0.313 (.191)	0.127 (.196)
Year 2	-0.374 (.228)	-0.125 (.233)	0.400 (.125)*	0.181 (.128)	0.362 (.171)*	0.167 (.175)
Year 3	-0.532 (.222)*	-0.223 (.228)	0.414 (.116)*	0.174 (.119)	0.412 (.156)*	0.206 (.160)
Year 4	-0.691 (.229)*	-0.322 (.234)	0.429 (.114)*	0.166 (.116)	0.460 (.149)*	0.246 (.152)
Year 5	-0.849 (.246)*	-0.421 (.251)†	0.443 (.117)*	0.159 (.120)	0.509 (.150)*	0.286 (.154)†
Year 6	-1.008 (.272)*	-0.520 (.278)†	0.457 (.126)*	0.151 (.129)	0.557 (.160)*	0.325 (.163)*
Year 7	-1.167 (.304)*	-0.618 (.312)*	0.471 (.140)*	0.144 (.143)	0.606 (.176)*	0.365 (.180)*
Year 8	-1.324 (.341)*	-0.717 (.350)*	0.486 (.158)*	0.136 (.161)	0.655 (.198)*	0.405 (.203)*
Year 9	-1.483 (.382)*	-0.816 (.392)*	0.500 (.177)*	0.129 (.181)	0.704 (.223)*	0.445 (.229)*
Year 10	-1.641 (.425)*	-0.914 (.436)*	0.514 (.199)*	0.121 (.203)	0.753 (.251)*	0.484 (.257)†
Year 11	-1.800 (.469)*	-1.013 (.482)*	0.529 (.221)*	0.114 (.227)	0.801 (.281)*	0.524 (.288)†
Time*Gang	-0.158 (.051)*	-0.099 (.053)†	0.014 (.027)	-0.007 (.028)	0.049 (.036)	0.040 (.037)
Propensity	-	-6.414 (.868)*	-	4.307 (.412)*	-	3.452 (.530)
Time*Propensity	-	-0.863 (.182)*	-	0.326 (.095)*	-	0.150 (.128)
Intercept	3.638 (.045)*	3.753 (.048)*	-0.853 (.017)*	-0.930 (.019)*	0.222 (.022)*	0.213 (.021)*
<i>Random Components</i>						
Intercept	2.258	2.246	1.040	1.029	1.374	1.369
Linear Slope	0.415	0.414	0.190	0.190	0.286	0.286
Log likelihood	-31299.8	-31282.5	-52294.4	-52239.6	-52577.9	-52556.7

* $p < .05$, † $p < .10$; $N=7978$, $NT=91186$

joining and the gang*time interaction coefficients anywhere from 20 to 65 percent. In the case of unemployment, selection controls render every coefficient statistically indistinguishable from zero. Differences remain, however, for employment and non-participation in the labor market, where the effect of gang joining becomes marginally significant at Year 5. At that time, respondents who joined gangs were less likely to be employed, and the likelihood of employment continued to stagnate on a yearly basis thereafter. Employment differences appear to be explained by gang joiners' accelerated movement out of the labor force compared to those that avoided gangs: the effects of gang joining on labor force non-participation nearly doubled between Year 5 ($b=.286, p<.10$) and Year 11 ($b=.524, p<.10$). Exploring the marginal effects of gang joining on employment status outcomes annually between 1998 and 2009 yields the first major result of this chapter: *Joining a gang has a constraining influence on the probability of employment that it remains steady over time and has an effect on labor force non-participation that intensifies over time.*

The Effects of Gang Joining on Linear Labor Supply Outcomes

Table 6.3 details the effects of gang joining on the percent of the year spent employed, unemployed, or out of the labor force. Without selection controls, gang joiners were spending about 7 percent ($p<.05$) fewer weeks employed at the one-year mark and 12 percent ($p<.05$) fewer weeks employed 10 years later. These differences are not trivial, as they translate into roughly 3 and 6 fewer total weeks employed on a yearly basis throughout the study, respectively.

Further, the gang joining effects on employment double from Year 1 to Year 12, which means that the employment lives for gang joiners are not improving at a rate comparable to their gang avoiding peers. Similar to the findings in Table 6.2, it appears that labor market non-participation is absorbing most of the differences. While gang joining has smaller effects on unemployment over time, the effects on non-participation gain steadily and double in magnitude by Year 11. Consistent with the grand descriptives presented in Table 6.1, the cumulative effect of gang joining is approximately one less year of employment (or one more year of joblessness) over the lifetime of the study.

After controlling for selection, the harmful effects of gang joining were delayed for several years or reduced entirely to non-significance. Selection controls eliminated unemployment differences at later years, but the more proximate effects of gang joining on unemployed remained. Gang joiners spent a greater number of weeks searching for employment than their gang avoiding counterparts. Alternatively, the more immediate and weaker gang effects on employment and non-participation were washed out, and lasting effects did not emerge until 5 and 8 years after gang joining. That said, beginning in Year 5 and continuing until Year 11, gang joiners were spending four to six percent fewer weeks employed compared to their gang avoiding counterparts. Spending two-three weeks per year without employment is by no means insignificant. Cumulatively, the marginal effects translate into an 18-week difference during the time span where statistically significant differences are observed. These findings lead to the second major result of the study: After adjusting for selection into

Table 6.3. Random-effects maximum likelihood estimates for linear labor supply outcomes

	Percent Weeks Employed		Percent Weeks Unemployed		Percent Weeks Non-participation	
	No selection controls	Selection controls	No selection controls	Selection controls	No selection controls	Selection controls
	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)
<i>Growth Components</i>						
Linear	0.049 (.000)*	0.050 (.001)*	0.001 (.000)*	0.001 (.000)*	-0.031 (.000)*	-0.030 (.001)*
Quadratic	-0.006 (.000)*	-0.006 (.000)*	0.000 (.000)*	0.000 (.000)*	0.003 (.000)*	0.003 (.000)*
<i>Average Marginal Gang Effects</i>						
Year 1	-0.065 (.028)*	-0.024 (.029)	0.044 (.009)*	0.030 (.009)*	0.042 (.027)	0.005 (.027)
Year 2	-0.070 (.026)*	-0.028 (.026)	0.043 (.008)*	0.027 (.008)*	0.045 (.024)†	0.010 (.025)
Year 3	-0.076 (.024)*	-0.031 (.024)	0.041 (.007)*	0.025 (.007)*	0.049 (.022)*	0.014 (.023)
Year 4	-0.082 (.023)*	-0.035 (.023)	0.040 (.007)*	0.023 (.007)*	0.053 (.020)*	0.019 (.021)
Year 5	-0.087 (.022)*	-0.039 (.022)†	0.038 (.007)*	0.021 (.007)*	0.057 (.020)*	0.024 (.020)
Year 6	-0.093 (.022)*	-0.042 (.023)†	0.037 (.007)*	0.018 (.008)*	0.061 (.019)*	0.028 (.020)
Year 7	-0.098 (.023)*	-0.046 (.023)*	0.035 (.008)*	0.016 (.008)*	0.064 (.020)*	0.033 (.021)
Year 8	-0.104 (.024)*	-0.050 (.025)*	0.034 (.009)*	0.014 (.009)	0.068 (.021)*	0.038 (.022)†
Year 9	-0.109 (.026)*	-0.053 (.027)*	0.032 (.010)*	0.011 (.010)	0.072 (.023)*	0.042 (.024)†
Year 10	-0.115 (.029)*	-0.057 (.030)†	0.031 (.011)*	0.009 (.011)	0.076 (.026)*	0.047 (.026)†
Year 11	-0.121 (.032)*	-0.061 (.032)†	0.029 (.012)*	0.007 (.012)	0.079 (.029)*	0.051 (.029)†
Time*Gang	-0.006 (.004)	-0.004 (.004)	0.002 (.002)	0.002 (.002)	0.004 (.004)	0.005 (.004)
Propensity	-	-0.742 (.077)*	-	0.271 (.025)*	-	0.506 (.069)*
Time*Propensity	-	-0.030 (.014)*	-	0.013 (.005)*	-	-0.012 (.014)
Intercept	0.691 (.003)*	0.705 (.003)*	0.064 (.001)*	0.059 (.001)*	0.240 (.003)*	0.231 (.003)*
<i>Random Components</i>						
Intercept	0.223	0.222	0.063	0.062	0.195	0.195
Linear Slope	0.037	0.037	0.011	0.011	0.036	0.036
Log likelihood	-20994.1	-20947.8	41901.5	41961.9	-19007.8	-18981.0

* $p < .05$, † $p < .10$; $N=7978$, $NT=91186$

gangs, the cumulative effect of joining a gang on weeks employed is roughly one-third of a year. While considerably smaller in magnitude than the naïve differences, it is important to consider that these effects intensify in early adulthood, a phase in the life-course when job stability and family formation become normative components among these age cohorts. Further, it appears that gang joiners are spending their time outside of the labor force entirely in emerging adulthood, as opposed to being unemployed and seeking but not finding work.

The Effects of Gang Joining on Linear Job Quality Outcomes

Table 6.4 displays the results from the random-effects models of the effects of gang joining on job quality outcomes. For annual income, the growth components indicate that there are large within-individual gains that tail off slightly over time. Respondents were earning over \$10,000 annually at Year 5 (around 2003); by Year 11 they were earning about \$29,000 (around 2009). The models without selection controls revealed a positive and statistically significant gang coefficient at Year 1. Thereafter, gang joiners continued to acquire income on an annual basis at a slower rate than gang avoiders throughout the study period. Statistical differences emerged at Year 6, where gang joiners earned \$1,711 ($p < .10$) less than gang avoiders, and continued through Year 11, where even larger differences were observed (\$5,190, $p < .05$).

Of course, these differences do not account for the non-random movement into gangs, which, as shown above, inflates the putative consequences of joining a

gang. Upon the application of selection controls, the effect sizes reduce by 19 percent at Year 6 (to marginal insignificance) to as much as 38 percent at Year 11. Clearly, the small economic disadvantages snowball at a steady pace into much larger disadvantages over time, and the statistically significant slope difference confirms that the rate of change differs across these groups. At Year 6, gang joiners were earning \$1,386 ($p < .10$; 90% CI: \$53, \$2,717) less than gang avoiders, which ballooned to \$3,294 ($p < .05$; 95% CI: \$113, \$6,475) less in legal income at the final wave of observation. Figure 6.1 details the emerging effects of gang joining on annual income over time. Reporting on only the statistically different patterns of annual income by gang membership leads to the third major result in the study: *The cumulative effect of joining a gang on annual income is \$14,000 over a 6-year period in early adulthood.* It is important to recall that the boundaries of the age cohorts range from 24 to 30 at the final wave of the NLSY97, which means that these differences are occurring at relatively early stages of the life-course. Revisiting these respondents one decade later under similar analytic circumstances would likely yield even larger differences in lifetime earnings.

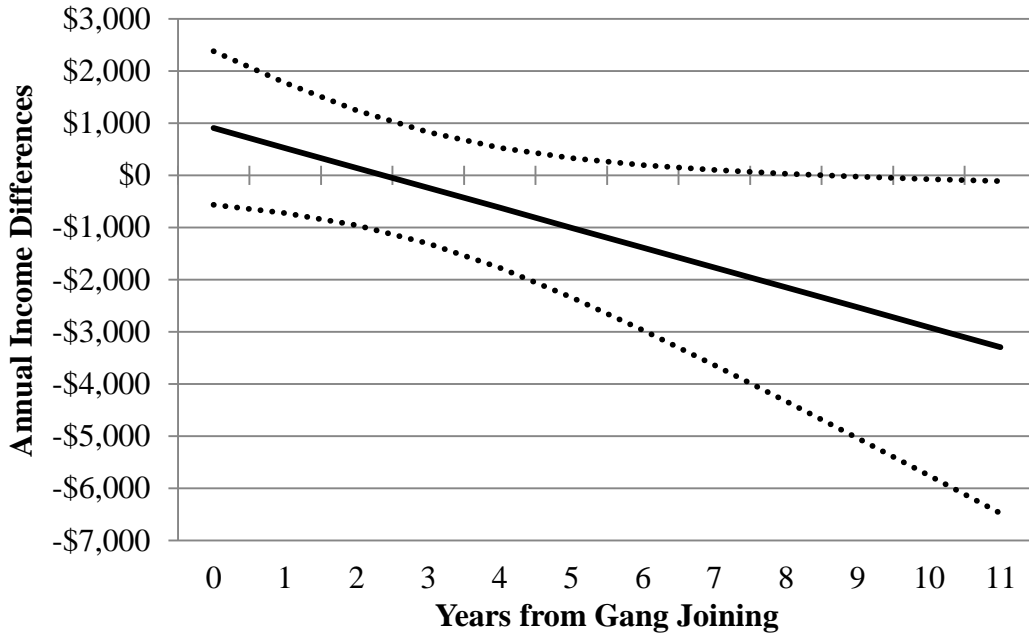
The final two models examine hours worked weekly and hourly rate of pay. With regard to hours work weekly, the linear trend indicates that non-gang respondents were working an additional 2 hours per week on average each year, but these increases leveled off over time, as demonstrated by the negative quadratic term. Without selection controls, gang joiners were averaging nearly 5 additional hours of weekly employment at Year 1. The effect decayed quickly

Table 6.4. Random-effects maximum likelihood estimates for linear job quality outcomes

	<u>Annual Income¹</u>		<u>Hours worked weekly²</u>		<u>Hourly rate of pay³</u>	
	No selection controls	Selection controls	No selection controls	Selection controls	No selection controls	Selection controls
	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)	<i>b</i> (se)
<i>Growth Components</i>						
Linear	2373 (21)*	2453 (25)*	1.931 (.022)*	2.001 (.025)*	1.099 (.027)*	1.124 (.030)*
Quadratic	130 (5)*	130 (5)*	-0.165 (.006)*	-0.165 (.006)*	- -	- -
<i>Average Marginal Gang Effects</i>						
Year 1	1768 (593)*	523 (637)	4.710 (1.16)*	1.599 (1.22)	1.779 (1.11)	1.108 (1.11)
Year 2	1072 (527)*	141 (562)	4.103 (1.04)*	1.267 (1.09)	1.715 (1.41)	1.140 (1.41)
Year 3	376 (517)	-240 (544)	3.496 (0.94)*	0.935 (0.99)	1.652 (1.23)	1.172 (1.23)
Year 4	-320 (566)	-622 (587)	2.889 (0.88)*	0.603 (0.92)	1.589 (1.12)	1.204 (1.12)
Year 5	-1015 (660)	-1004 (681)	2.282 (0.84)*	0.271 (0.88)	1.526 (1.08)	1.236 (1.08)
Year 6	-1711 (784)*	-1386 (807)†	1.674 (0.85)*	-0.061 (0.88)	1.462 (1.13)	1.268 (1.13)
Year 7	-2407 (925)*	-1767 (954)†	1.067 (0.90)	-0.393 (0.93)	1.400 (1.25)	1.300 (1.25)
Year 8	-3103 (1077)*	-2149 (1112)†	0.460 (0.98)	-0.725 (1.00)	1.336 (1.43)	1.333 (1.43)
Year 9	-3798 (1236)*	-2531 (1278)*	-0.147 (1.08)	-1.057 (1.11)	1.272 (1.66)	1.365 (1.66)
Year 10	-4494 (1399)*	-2912 (1449)*	-0.754 (1.21)	-1.389 (1.23)	1.209 (1.90)	1.397 (1.90)
Year 11	-5190 (1566)*	-3294 (1623)*	-1.361 (1.34)	-1.721 (1.37)	1.146 (2.16)	1.428 (2.16)
Time*Gang	-696 (177)*	-382 (186)*	-0.607 (0.18)*	-0.332 (0.19)†	-0.063 (0.30)	0.032 (0.31)
Propensity	- -	-237 (2624)	- -	30.667 (3.12)*	- -	4.430 (3.70)
Time*Propensity	- -	-4728 (726)*	- -	-4.155 (0.70)*	- -	-1.425 (0.83)†
Intercept	10300 (106)*	10313 (114)*	35.114 (0.12)*	34.574 (0.13)*	10.70 (.004)*	10.63 (0.12)*
<i>Random Components</i>						
Intercept	6973	6971	7.766	7.694	6.817	6.819
Linear Slope	1853	1847	1.419	1.413	-	-
Log likelihood	-657523	-657488	-285707	-285636	-310335	-310332

* $p < .05$, † $p < .10$; ¹ $N=7,813$, $NT=61,892$; ² $N=7,879$, $NT=72,819$; ³ $N=7,884$, $NT=68,945$; Huber-White standard errors are reported

Figure 6.1. The effects of gang joining on annual income over 12 years



Solid line represents predicted value; Dotted lines represent 95% confidence intervals

over the years, however, as the direction of the sign switched by Year 9, which is demonstrated by the negative time*gang interaction effect ($b=-0.61, p<.05$). The application of selection controls reduced all of the gang joining effects to non-significance, with the exception of the marginally significant slope difference for gang joiners ($b=-0.33, p<.10$). Therefore, when gang joiners are employed, they maintain comparable hours of weekly employment relative to their gang avoiding counterparts. With regard to hourly rate of pay, the linear trend reveals \$1.10 ($p<.05$) gains on a yearly basis. This results in a within-individual average increase of about \$13.00 per hour during the period of observation. Even without the application of selection controls, no differences emerged between gang joiners and gang avoiders, rendering the examination of the selection model futile.

The above findings with regard to hours worked weekly and hourly rate of pay lead to the fourth and final major result of the study: *When gang joiners are employed, no differences are observed for job quality in terms of hours worked per week and the rate of compensation. Thus, it appears that differences in annual income are attributable to less consistent patterns of employment among gang joiners.*

Chapter 7

DISCUSSION

Overview

Does adolescent gang membership have consequences that cascade into non-criminal life domains in the life-course? Answering this question in terms of educational attainment and employment history over longer time periods speaks to larger debates in criminology surrounding population heterogeneity and state dependence in the explanation of problem behavior continuity. To the extent that joining a gang matters in explaining these outcomes, above and beyond selection effects, provides support for arguments on the relevance of life states in the explanation of criminal and non-criminal behaviors. Further, to the extent that joining a gang matters in explaining these outcomes, these findings extend the significance of gang membership beyond the domains of crime and victimization and reaffirm the significance of gang prevention programming.

This dissertation examined the impact of adolescent gang joining on non-criminal outcomes in two prevailing social institutions—education and employment. Prior to this study, knowledge of the consequences of gang membership was limited to geographically-select samples, subject to claims of selection bias, confined to brief cross-sections in time, and concentrated narrowly on very specific non-criminal outcomes. This study extended this line of research in important ways using data from a nationally representative sample of persons born between 1980 and 1984. Respondents were surveyed annually from 1997 to

2009 and this dissertation traced the educational attainment and employment histories trajectories over this period.

To determine what role, if any, gang membership had in offsetting positive development, this dissertation concentrated on a subset of first-time gang joiners and compared their education and employment trajectories to those that avoided gangs after controlling for non-random gang selection processes. Naturally, statistical and substantive differences were observed between these groups prior to selection adjustments; the ecological context where gangs emerge and persist is far different from the environments of where most youth in the study were raised (see Appendix D). The key findings of this dissertation include:

- (1) The application of selection adjustments partially or fully confounded the effects of gang joining by anywhere from 20 to 80 percent for both educational attainment and employment outcomes;

After these adjustments were made, however, differences remained between gang joiners and those that avoided gangs at the time of treatment, including:

- (2) Gang joiners had 70 percent the odds of earning a high school diploma and 42 percent the odds of earning a 4-year college degree than matched individuals who did not join a gang;
- (3) The effect of gang joining on educational attainment was -0.62 years, which equates to over one-half year of less schooling;
- (4) While gang joiners were able to make up for more proximate deficits in high school graduation and college matriculation, the gaps in 4-year college degree and overall educational attainment gained steadily throughout the 12-year study period;
- (5) Gang joiners were less likely to be employed and more likely to not participate in the labor force, and these differences accelerated toward the end of the study;

- (6) In the last 8 years of the study, gang joiners spent an additional one-third of a year unemployed or out of the labor force;
- (7) The cumulative effect of gang joining on annual income in the last 6 years of the study exceeded \$14,000.

Based on these key findings there are seven points that merit further consideration.

Key Discussion Points

First, individuals who join gangs pay an educational attainment penalty that amounts to approximately one-half year of schooling. At first glance this difference appears trivial. It is not. Those who joined a gang completed 11.6 years of education, compared to 12.2 years of their matched counterparts. This half-year disparity is the difference between earning a high school degree and falling short of that critical benchmark. There is perhaps no better example of the consequences of being a high school dropout than lifetime earnings: High school dropouts will earn \$300,000 less than high school graduates, \$600,000 less than college attendees without a degree, and \$1,300,000 less than college graduates with a 4-year degree (Carnevale, Rose, and Cheah, 2011), with the patterning of these differences persisting within and across occupations. In the absence of a high school diploma, individuals are shut out from many employment opportunities, even in the secondary labor market, which would portend more troublesome patterns of employment due to unrewarding, unsatisfying, and unstable job qualities for gang joiners.

The consequences of educational deficits extend well beyond the realm of economics. Hout (2012) noted both private and social non-market returns to education. Private non-market returns include advantages in health, social capital, civic participation, and familial stability. Gang joiners will not bear the benefit that an additional one-half year of education will produce in these very important areas. Further, education serves as one of the central socializing institutions for adolescent and emerging adults, where friendships, relationships, and intellectual and extracurricular interests develop. Educational shortcomings mean missing out on many of the activities and experiences of American culture. Even more, when considered in aggregate form, clusters of neighborhoods and communities—where gangs emerge and thrive—will not benefit from the social, non-market returns of a more educated populace, which leads to the second key point in the dissertation.

Second, prospective gang members are drawn from a pool of adolescents in disadvantaged environments that could benefit most from educational advances. Brand and Xie (2010) referred to this as the negative selection hypothesis, in that heterogeneous treatment effects demonstrate the greatest economic returns to those with the lowest propensity to attend college. Youth from the neighborhoods and communities where gangs are active—characterized by a host of concentrated social and economic disadvantages (Katz and Schnebly, 2011; Pyrooz et al., 2010; Tita et al., 2005)—are less likely to complete high school and attend college (Ainsworth, 2002; Harding, 2003). Unlike youth in some social and cultural circles, where attending college is the norm, youth from

such disadvantaged environments are not necessarily expected, nor encouraged, to attend college, let alone graduate from high school. Thus, the life prospects are not particularly optimistic for such youth, despite the fact that there is so much to potentially gain from educational achievement. Duncan and Murnane (2011: 3) noted that for “many generations of Americans, education was the springboard to upward mobility.” Thus, by stunting the advances of wide swaths of largely young, male, and minority individuals, it appears that gangs are contributing to the larger, vicious cycle of inequality and social stratification in their environments by incubating a context that flips the values of future-oriented actions on their head at such a critical life phase. It is important to reiterate that, when compared to their matched counterparts, gang joiners had a reduced likelihood of graduating from high school and attending and graduating from college, which results in a net loss of over one-half year of education. These differences are not subtle, especially when considering that 8 percent of youth join gangs and that gangs cluster within specific geographic areas. It is likely that one of the most serious social consequences of gang processes is that they contaminate the larger educational environment. Across multiple generations, this could contribute to the rigidity of an unequal class structure.

Third, there is little evidence to support the notion gang joiners are able to compensate for earlier educational setbacks. Recall that the modal educational pathway in this nationally representative sample involved graduating from high school and matriculating to college. The results of this study indicate clearly that gang joiners diverged from this pathway. Over time, gang members accumulate

educational disadvantages. This is consistent with the theoretical arguments of this study: Factors endogenous to gang membership, including criminal involvement, cultural orientations, and social isolation, will continue to impact educational trajectories. Limiting the period of observation to the last five years of the study (results not shown) also reveals that gang joiners' matched counterparts gain in educational attainment at faster rates. The steadily growing educational attainment gap, between those in gangs and those who resist joining, suggests that gang joining youth display an inability to "catch up" despite the many years removed from the onset of gang membership. On the surface, this clearly demonstrates the consequences of gang membership, but more importantly it illustrates the difficulty surrounding compensating for off-time transitions in the adolescent life-course (Krohn et al., 2011). One could examine how gang membership compares to other educational snares in the adolescent life-course to determine or rank the roadblocks to educational success (Rumberger and Lim, 2008). The empirical evidence presented above not only indicates that joining a gang has an impact on educational trajectories, but demonstrates also that it has long-lasting, cumulative effects on educational attainment as people navigate into early adulthood. While is good news for gang members, but it leads to the next point.

Despite this, it is important to point out that not all gang joining youth are high school dropouts or remain at an educational achievement standstill. In fact, a modest portion of gang joiners go on to earn a 4-year degree. When decomposing the educational attainment gap into key educational milestones, by the final wave

of the study, gang joiners were no longer at their empirically “worst” position. That is to say, gang joiners were able to wash away some of the more proximate losses over time for high school graduation and college matriculation—losses that, by design, cannot be attributed to being younger or repeating a grade prior to joining a gang. Thus, gains in educational attainment were empirically undetectable because their matched counterparts were gaining equivalently, albeit in more advanced educational realms. One route to compensate for educational differences was attaining a general equivalence degree. While Cameron and Heckman (1993: 41) noted the “exam-certified equivalents are statistically indistinguishable in their labor market outcomes from high school dropouts,” it appears that gang joiners utilize the GED route in a manner different from their matched counterparts. Gang members who earned a GED were twice as likely to attend college as non-gang GED earners. Although speculative, such movement could signify purposive action in the process of identity reconstruction that the role transition and desistance literatures discuss (Ebaugh, 1998; Giordano et al., 2002; Maruna, 2001; Pyrooz and Decker, 2011). Future waves of the NLSY97 might reveal educational gains, although likely modest, among gang joiners as they are allotted more time to follow their scripts for positive change to complete their college degrees.

Fourth, the employment prospects are unfavorable for gang joining youth in terms of labor patterning, but not job quality outcomes. That is to say, when gang joiners were employed, the characteristics of their jobs did not differ from their matched counterparts for hours worked weekly and hourly rate of pay.

Supplementary analysis (results not shown) revealed no differences in job satisfaction, reliance on government assistance, or the number of jobs worked. These findings are contrary to what was hypothesized, in that both the patterning *and* quality of jobs would be impacted by joining a gang (e.g., Moore, 1991). With regard to job quality, there are several explanations for this contradictory finding, the first of which is that this is a story of selection. Labor market changes over the past several decades have impacted youth in marginalized settings equally, regardless of whether they have been involved in a gang. As a result, few differences are observed in job quality because both sets of individuals are occupying comparable, secondary sector occupations with less appealing characteristics. The second explanation is that by constricting the window of observation into respondents' employment lives prior to age 30, it has prevented non-joiners from realizing their educational gains (e.g., high school diploma; advanced degree). Promotions, transfers, and job placements take time before they pay job quality dividends. In other words, the consequences of gang membership on job quality have yet to emerge due to natural suppression effects of the changing nature of employment in emerging and early adulthood that Arnett (2004) has documented. While the latter explanation could very well be accurate, the empirical evidence suggests that, after accounting selection and preexisting factors, there are no differences in job quality between those that join gangs and their matched counterparts.

Fifth, the cumulative effect of gang joining on annual income exceeded \$14,000, but job supply rather than job quality appears to be driving these

differences. Gang joiners were less likely to be employed and were employed for fewer weeks than their matched counterparts, especially toward the latter half of the observation period. Indeed, gang joiners spent one-third of a year unemployed or out of the labor force in the final eight years of observation. Differences in the patterning of employment emerged parallel to growing disparities in annual income. As a result, it is not that lower hourly rates of pay or working on average fewer hours are accounting for annual income disparities, but, instead, that gang joiners are spending more weeks unemployed or out of the labor force throughout the year. The finding that gang joiners experience less stable patterns of employment is consistent with prior quantitative studies of gang membership and employment (Krohn et al., 2011; Thornberry et al., 2003), as well as qualitative descriptions of gang members in the workplace (Decker and Van Winkle, 1996; Moore, 1991). It was not uncommon for gang respondents to exhibit the following example of general employment patterns: employed for 60 percent of 2004, 70 percent of 2005 and 2006, 55 percent of 2007, 96 percent of 2008, and then jobless throughout 2009. The fact that the consequences of gang joining on employment patterns are delayed for several years, and that the effects exacerbate over time, suggests that gang joiners are experiencing greater trouble in the labor market while their peers succeed.

Wilson (2009) pointed to the changing nature of the skill sets necessary for employment in the United States over the last several decades as negatively impacting those from marginalized settings. Deindustrialization has complicated labor opportunities for individuals who have not adapted to larger shifts in

educational and training requirements. Declining manufacturing opportunities and emerging service sector opportunities introduce issues for gang joiners, as the requisite “soft skills” for face-to-face interaction in a customer service-driven economy can operate at odds to the cultural orientations of the gang context. The shrinking pool of blue collar jobs—good jobs that Moore (1991) and Hagedorn (1998) highlighted as a natural fit for ex-gang members—introduces greater competition for those positions. While competition for blue collar jobs may have increased over the last several decades, labor market demand was decreasing as supply was increasing. Yet, gang joiners relied heavily on blue collar occupations, at a rate of about one-third throughout the observation period. Service jobs in the food, cleaning, or sales industries were quite common as well—again, about one-third of gang joiners worked in this industry. Positions that required post-secondary education (e.g., professional or management jobs) were rare, as the educational attainment deficits among gang joiners shut them out of these jobs. The problem is that professional employment positions are associated with the greatest job stability, whereas employment in the blue collar and service sectors introduce instability due to the nature of the job or declining demand in the industry.

Supplementary analyses, however, revealed no differences between gang joiners and gang avoiders in blue-collar or service sector employment. Selection controls washed away statistical differences between groups in blue collar occupations. This suggests that the instability in employment patterns among gang joiners cannot be attributed solely to the fragile or unrewarding industries

they enter, which raises additional questions about how such patterns emerge. There are several alternative explanations that might guide this finding. First, personal networks of gang joiners are more limited than their gang avoiding counterparts, as the ensnaring forces of gang involvement disrupt sources of social capital that could assist in seeking new employment in the event of job loss. This is consistent with the social isolation hypothesis argued above, and with research on the interplay between securing a job and the bounded conventional networks of groups such as gangs (Decker et al., 2012; Granovetter, 1983; Pyrooz et al., 2012). Second, in the absence of a high school degree and in the presence of the stigma of tattoos, gang labels, or an arrest record, employers in the various industries are able to turn to less “troublesome” applicants. “If somebody gave me their address, uh, Cabrini Green [a high-crime, Chicago gang neighborhood] I might unavoidably have some concerns,” remarked a president of an inner-city manufacturing company (Wilson, 2009: 74; see also Boyle, 2010). Finally, “off-book” income might compensate for the lack of compensation during bouts of unemployment or non-participation in the labor market. Several studies have mentioned that current and former adult gang members secured income in this manner (Horowitz, 1983; Moore, 1991). Although limited only to 5 years after treatment, supplementary analyses revealed that gang joiners continued to sell drugs at higher rates than non-joiners. In summary, gang joiners spend greater durations of time unemployed or as labor force non-participants, which in turn results in increasingly larger income disparities.

Sixth, the results of this study provide added support for the contention that gangs are more than a figment of the criminological imagination. A number of commentators, for various reasons, have held that gangs are an artifact of selection, a product of sociological positivism and moral panics, and unworthy of empirical research (Katz and Jackson-Jacobs, 2004; Gottfredson and Hirschi, 1990; Hallsworth and Young, 2008; Sullivan, 2005). This study explored such claims by isolating the effects of gang membership from those of selection, and framed this line of questioning in terms of the larger debate surrounding population heterogeneity and state dependence perspectives on the explanation of the continuity in problem behaviors. The findings, in effect, provide support for *both* population heterogeneity and state dependence theories. The support for the former, however, requires a broad interpretation of population heterogeneity because both static and dynamic selection processes are at work, attenuating the influence of gang joining. A strict interpretation, which was not examined, would involve estimating the additive effect of gang joining net of some time-stable criminogenic characteristic, such as poor self-control, impulsivity, neuropsychological deficits, or some genetic predisposition (Caspi et al., 1994; Gottfredson and Hirschi, 1990; Wilson and Herrnstein, 1985). Given the breadth of the vector of covariates used to capture selection into gangs, it is safe to conclude that gang joining would retain statistical and substantive significance in the face such stable criminal characteristics.

The support for state dependence is much clearer. Whether in consideration of time-stable criminal characteristics (e.g., population

heterogeneity) or the cumulative continuity of disadvantage (e.g., state dependence), joining a gang corresponds with less advancement in education and less successful work histories. Gang membership has broad consequences that extend well beyond the short-term and spread well beyond the traditionally studied domain of criminal behavior. To be sure, joining a gang has a long-lasting effect on the life-course. The actions of today have causal implications for the behaviors of tomorrow. This does not discount the role of selection factors; they clearly matter. But what these findings indicate is that “once in place, those environments take on a history of their own in a way that invalidates a pure spuriousness or self-selection argument” (Laub and Sampson (1993: 320).

Entering into gang trajectories initiates a temporal contagion process consistent with state dependence theories that would not have otherwise occurred *but for* the onset of joining a gang. For this reason, gang membership can be viewed as a turning point in the life-course (Melde and Esbensen, 2011; Thornberry et al., 2003), and the turning point significance of joining a gang extends to educational attainment, employment, and economic domains. The consequences of gang membership are very real—they are not an artifact of selection, they accrue over time in non-criminal domains, and they need to be better understood in order to respond to the problem.

With this in mind, ignoring stable and dynamic forms of selection into gangs will overstate the influence of gang membership on problem behaviors. Gang joining is by no means a random process and the factors leading youth into gangs are also factors that result in educational shortcomings and inconsistent

patterns of employment. Outside of experimentation and instruments, both of which are almost entirely implausible, accounting for selection processes will result in a more accurate understanding of the consequences of joining a gang.

Seventh, deriving from the perspectives of population heterogeneity and state dependence are complementary implications for responding to gang membership. Recall that selection accounted for anywhere from 20 to 80 percent of the naïve differences observed between those joining and avoiding gangs. From a broad interpretation of population heterogeneity, programming that targets general selection processes would (1) weaken the mechanisms of cumulative continuity responsible for variability in non-criminal outcomes and (2) reduce the odds of gang joining, which will in turn improve non-criminal outcomes. Single-parent households, for example, are a risk factor for delinquent offending and a risk factor for gang membership (Odds Ratio=1.68, $p<.05$ [see Appendix C]; Anderson, 2002). From several micro-level theories, the absence of a second parent implies more time for unstructured socializing (Horney, Osgood, and Marshall, 1995), a greater burden on the present parent to instill self-control (Gottfredson and Hirschi, 1990; Pratt and Cullen, 2000), and one less source to positively and negatively reinforce good and bad behavior, respectively (Akers, 2009). Programs that occupy the free time of adolescents and appropriately discipline the anti-social behaviors should not only prevent acts of delinquency, but also reduce the probability of associating with gangs. A parallel argument was made by Esbensen and colleagues (2001) in the first national evaluation of the Gang Resistance Education and Training (GREAT) program when finding non-

significant programs effects on gang membership. While the stated goal was to reduce the odds of joining a gang, the implied goals of the study were satisfied because youth had more positive views of the police, more negative views of gangs, and more pro-social attitudes. In this respect, targeting selection factors should correspond with “rising tides” to benefit the life chances of all youth, not simply gang youth. Doing so could be enough to prevent some youth—but not all—from linking up with gangs.

From a state dependence approach, the findings from this study provide strong support for gang prevention efforts to target specific selection factors to reduce the odds of joining a gang and gang intervention efforts to reduce the impact of gang membership. That said, emerging research has found little evidence to suggest that the correlates of gang membership differ from the correlates of anti-social behaviors (Esbensen, Peterson, Taylor, and Freng, 2009). Nevertheless, it is important to recall that gang joiners were empirically matched to a group that exhibited similar characteristics, but differed only in that they joined a gang in 1998. The fact that the effects of gang membership (1) were observed outside of the domains of crime and victimization, (2) gained in magnitude over time, and (3) were observed above pre-existing characteristics indicates that gang joining foreshadows long-term difficulties and crystallizes a series of bad decisions. Keeping youth out of gangs should result in improved life circumstances; more education and more stable employment should result in healthier families and a better quality of life. To accomplish this objective in terms of prevention, it is necessary to target the harmful effects of selection

factors. Until recently, several scholars have pointed out that there are no gang prevention programs meeting the Blueprints criteria of randomization, replication, and lasting preventative effects (Thornberry, 2010; see also Klein and Maxson, 2006). Recently, however, the second national evaluation of GREAT demonstrated that the administration of the core curricula reduced the odds of gang membership one-year post-treatment (Esbensen et al., 2012). The findings of this dissertation indicate that efforts to prevent the onset of gang membership and minimize the effects of gang membership are important activities that will likely yield substantial positive benefits across a wide range of life domains.

Directions for Future Research

This dissertation concludes by laying out an agenda for future research. First, it is important to understand whether the treatment effects (i.e., gang joining) are heterogeneous across demographic, gang, ecological, and geographic contexts. With regard to *demographic context*, there is reason to believe that the educational and employment experiences might differ for female and minority gang members. Sullivan (1989) reported that the parochial networks of black and Hispanic gang members did not extend into the business community, thus white gang members had less difficulty securing employment. Further, Skiba and colleagues' (2011) review of the literature indicates that racial and ethnic minorities experience more punitive suspension and expulsion procedures than their white counterparts. With regard to *gang context*, it is entirely consistent with the theoretical model of this study that the dosage of treatment—in terms of the

duration of gang membership, embeddedness within a gang, or the organizational characteristics of the group (Pyrooz, Fox, Katz, and Decker, 2012; Pyrooz et al., 2012)—would be related to the outcomes. In part because the modeling strategy for this study called for a well-specified treatment (i.e., first-time gang joining, pre-treatment matching covariates), this study was unable to gauge the extent to which this expectation would receive support. Further, this highlights an important aspect of this study: the counterfactual could include future gang joiners. While this occurred at lower rates than one might expect, essentially this could pit 1998 gang joiners against 1999 gang joiners in assessing the effects of gang membership. The fact that statistical differences emerged in light of these methodological considerations indicates that the above findings can be viewed as conservative. Other modeling strategies were considered, but their limitations exceeded those of the current study.

With regard to *ecological* and *geographic context*, it would be expected that the effects of gang joining increase in magnitude in areas characterized by more punitive laws, procedures, and other institutionalized efforts to combat gangs (e.g., Los Angeles, Chicago). Further, it would be expected that the effects of gang joining vary along lines of social and economic disadvantage and labor markets characteristics. Comparing gang youth in East Los Angeles (e.g., Moore, 1991) to those in western New York (e.g., Thornberry et al., 2003) may result in different effects. Of course, this could occur when examining the gang youth in the same city or metropolitan area as well (e.g., East Los Angeles to Santa Monica gang youth).

The main point is that if “not all gang members are created equal” (Thornberry et al., 2003: 6; Pyrooz et al., 2012) then the consequences of gang membership should not be invariant. While this study used the education and employment, the gang→offending literature has proceeded with the notion of invariance. That is, gang membership has homogeneous effects on criminal offending. The application of this notion to education and employment seems questionable, as there are a host of factors that influence—via moderation and mediation—the effects of gang membership on a range of outcomes. It was beyond the scope of this study to parse out the “randomness” of the gang effect, but it should be a priority for future research. After all, explaining variability in gang effects allows us to peek inside the black box of gang processes. It appears that one of the pitfalls surrounding the use various quasi-experimental techniques to obtain causal effects of gang joining is that it detracts from understanding heterogeneous treatment effects.

Second, it is necessary to better understand how the lives of gang youth change from gang onset forward. More empirical research has concentrated on the risk factors of gang membership and the criminal consequences of joining a gang than on the mechanisms, activities, and nature of life in the gang and life after the gang (Klein and Maxson, 2006; Melde and Esbensen, 2011; Pyrooz and Decker, 2011; Pyrooz et al., 2010). Rich accounts of gang and ex-gang lives are found in the qualitative literature (e.g., Decker and Van Winkle, 1996; Moore, 1991; Short and Strodbeck, 1965; Thrasher, 1927), but without non-gang groups and individuals to facilitate comparisons, it is impossible to determine how these

factors differ from those that avoid gangs entirely (Klein, 2005; Kreager et al., 2011). Beginning with gang onset as a point of reference and moving forward through the gang processes allows for an examination of the reciprocal relationship between education, employment, and life during and after the gang. After all, while “the activity [crime] that generates our attention to gangs encompasses a fairly narrow slice of the typical gang member’s day or night” (Klein and Maxson, 2006: 69), these other, more prevalent activities are instrumental for understanding non-criminal outcomes. How do such activities impact educational, employment and economic pursuits? Do educational attainment trajectories accelerate after desisting from gang membership? Does employment become more stable after desisting from gang membership? If so, how do the daily routines of ex-gang members make such gains possible? Answering these questions will not only assist attitudinal and behavioral intervention efforts targeting this clientele, but they will also provide empirical evidence about the non-criminal (i.e., the modal) aspects of life in and after the gang. Such endeavors will identify similarities and differences relative to non-delinquent youths as well as youth in other deviant peer groups. This line of research will help us understanding how experiences and activities of gang members stack up to their peers.

Third, the respondents in this study were traced over a 12-year period—the youngest cohort ranged from ages 12-25 and the oldest cohort from ages 17-30. Given what is known about emerging and early adulthood, respondents are just beginning to settle into their careers. The findings of this dissertation imply

that, during this life phase, those who avoided gangs experienced a smoother transition into educational and employment roles. One could hypothesize that non-gang respondents will continue to experience better circumstances in their employment and economic lives while gang joiners experience only modest gains. Longitudinal studies in criminology are beginning to “come of age” to answer this line of questioning. In particular, studies in Denver, Montreal, Pittsburgh, Rochester, Seattle, and the current work contain large cohorts of adolescent gang joiners who are now in their 30s and 40s. This research could shed tremendous light not only on the education and employment outcomes of these respondents, but also extend this line of research to family formation and functioning, criminal involvement and late criminal desistance, and the routine activities and behaviors in their adult lives (e.g., religious involvement, civic participation, community involvement). With an estimated 731,000 gang members spanning all 50 states in the US (Egley and Howell, 2011), it is important to understand how gang membership impacts the life-course. A coordinated approach to understanding the long-term consequences of gang membership would be invaluable, allowing for the identification of empirical regularities and anomalies. It could answer questions pertaining to geographic context and address Klein’s (2005: 135) critique that gang research “would be far more productive if it were based on comparisons.” Further, it would lead to a more systematic union with life-course criminology, which has been identified as the emerging paradigm of criminological research (Cullen, 2011; Laub, 2006).

This dissertation examined areas not commonly considered when thinking about the consequences of gang membership—education and employment. Only a handful of studies have explored these issues until now, with most scholarship focused on the criminality of gangs and gang members. After all, Klein and Maxson (2006: 68) noted that:

. . . it is the crime committed by gang members, the fear that gangs engender in community residents, and the social harm and injury caused by gang involvement that most often is used to justify enormous public expenditure for specialized gang enforcement, prosecution, and punishment, as well as for prevention and intervention programs

Perhaps viewing gangs and gang membership outside the lens of crime and criminal justice would help craft responses that re-integrate current and former gang members into conventional society, repair and extend disrupted social networks, and reinitiate the collection of human capital. To do so would mean that we concentrate on outcomes other than crime. We are only beginning to understand how lives change when adolescents join gangs.

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APPENDIX A
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APPENDIX B

DESCRIPTIVE STATISTICS FOR THE SELECTION VARIABLES

Appendix B. Descriptive statistics for the selection variables (N = 7,978)

	Mean	(SD)	Min	Max
<i>Individual</i>				
Age (in months)	177.66	(17.36)	146	219
Age squared	31863.88	(6186.29)	21316	47961
Male	0.50	---	0	1
Black	0.26	---	0	1
Hispanic	0.21	---	0	1
Foreign born	0.03	---	0	1
Sexually active	0.29	---	0	1
Delinquency variety score	0.41	(0.92)	0	9
Body Mass Index (BMI)	21.94	(4.53)	0.81	109.43
Perceptions of weight scale	2.12	(0.81)	0	4
Witnessed shooting (< age 12)	0.10	---	0	1
Perceptions of arrest	59.13	(40.53)	0	100
Arrested	0.07	---	0	1
Dating	0.54	---	0	1
Bullied (< age 12)	0.19	---	0	1
Communicative difficulties	0.04	---	0	1
Annual hours worked	159.34	(523.08)	0	1140
<i>Family</i>				
Household size	2.45	(1.28)	0	12
Teen mother	0.19	---	0	1
Parental education	12.51	(2.81)	1	20
One parent household	0.31	---	0	1
Other household	0.19	---	0	1
Income-to-poverty ratio	2.87	(2.72)	0	16.27
Family in gang	0.18	---	0	1
<i>Peer</i>				
Anti-social peers scale	1.31	(1.06)	0	4
Pro-social peers scale	2.05	(0.72)	0	4
Peers in gangs scale	0.54	(0.93)	0	4
<i>School</i>				
Grade in years	7.68	(1.57)	0	12
Grade retention	0.16	---	0	1
Absences	4.65	(7.14)	0	200
Tardiness	2.22	(6.54)	0	99
Fights at school	0.16	---	0	1
Threatened at school	0.20	---	0	1
Belongings stolen at school	0.24	---	0	1
Neg. school environment index	1.13	(0.36)	0	2.83
PIAT (Peabody assessment) math score	46.94	(34.48)	0	100
<i>Community</i>				
Poverty rate	14.24	(7.39)	2.6	53.2
Percent Black	14.63	(15.67)	0.04	75.80
Percent Hispanic	10.42	(15.05)	0.3	85.2
Percent unemployed	6.75	(2.26)	1.8	16.5
Racial/ethnic heterogeneity	32.57	(18.42)	1.28	73.21
Median income	35252.95	(8793.32)	12136	65201
Population density	2042.12	(5837.37)	4	52432
House burglarized	0.15	---	0	1
Gangs in neighborhood	0.44	---	0	1

APPENDIX C

TRADITIONAL AND RARE EVENTS LOGISTIC REGRESSION MODELS

PREDICTING TREATMENT

Appendix C. Traditional and rare events logistic regression predicting treatment ($N = 7,978$)

	Traditional logit			Rare events logit		
	<i>b</i>	(se)	<i>p</i>	<i>b</i>	(se)	<i>p</i>
Age (in months)	0.180	(0.157)	0.25	0.166	(0.156)	0.29
Age squared	-0.001	(0.000)	0.19	-0.001	(0.000)	0.22
Male	0.574	(0.239)	0.02	0.548	(0.237)	0.02
Black	-0.081	(0.317)	0.80	-0.088	(0.314)	0.78
Hispanic	0.511	(0.332)	0.12	0.499	(0.330)	0.13
Foreign born	-1.385	(0.810)	0.09	-1.159	(0.804)	0.15
Sexually active	0.982	(0.265)	0.00	0.939	(0.263)	0.00
Delinquency variety score	0.128	(0.077)	0.10	0.128	(0.076)	0.09
Body Mass Index (BMI)	0.019	(0.028)	0.50	0.022	(0.027)	0.41
Perceptions of weight scale	-0.137	(0.125)	0.27	-0.143	(0.124)	0.25
Witnessed shooting (< age 12)	0.217	(0.244)	0.37	0.212	(0.243)	0.38
Perceptions of arrest	0.000	(0.003)	0.90	0.000	(0.003)	0.89
Arrested	-0.085	(0.321)	0.79	-0.080	(0.319)	0.80
Dating	0.626	(0.254)	0.01	0.595	(0.252)	0.02
Bullied (< age 12)	0.192	(0.246)	0.44	0.206	(0.244)	0.40
Communicative difficulties	0.365	(0.401)	0.36	0.389	(0.398)	0.33
Annual hours worked	0.000	(0.000)	0.45	0.000	(0.000)	0.60
Household size	0.070	(0.076)	0.36	0.071	(0.075)	0.34
Teen mother	-0.185	(0.264)	0.48	-0.129	(0.262)	0.62
Parental education	-0.113	(0.046)	0.02	-0.109	(0.046)	0.02
One parent household	0.528	(0.251)	0.04	0.521	(0.249)	0.04
Other household	0.526	(0.261)	0.04	0.515	(0.259)	0.05
Income-to-poverty ratio	-0.024	(0.080)	0.77	-0.014	(0.079)	0.86
Family in gang	0.756	(0.195)	0.00	0.735	(0.194)	0.00
Anti-social peers scale	0.061	(0.133)	0.65	0.058	(0.132)	0.66
Pro-social peers scale	0.332	(0.132)	0.01	0.325	(0.131)	0.01
Peers in gangs scale	0.038	(0.095)	0.69	0.038	(0.094)	0.69
Grade retention	-0.032	(0.288)	0.91	-0.024	(0.285)	0.93
Absences	0.010	(0.007)	0.18	0.012	(0.007)	0.10
Tardiness	0.009	(0.008)	0.28	0.010	(0.008)	0.23
Fights at school	0.204	(0.244)	0.40	0.218	(0.242)	0.37
Threatened at school	0.546	(0.222)	0.01	0.536	(0.220)	0.02
Belongings stolen at school	0.026	(0.250)	0.92	0.023	(0.248)	0.93
Healthy environment index	0.281	(0.251)	0.26	0.286	(0.249)	0.25
PIAT (Peabody assessment) math score	0.003	(0.004)	0.35	0.003	(0.003)	0.40
Poverty rate	-0.066	(0.039)	0.09	-0.060	(0.039)	0.12
Percent Black	0.000	(0.000)	0.89	0.000	(0.000)	0.81
Percent Hispanic	0.101	(0.070)	0.15	0.097	(0.069)	0.16
Percent unemployed	0.019	(0.018)	0.29	0.020	(0.018)	0.27
Racial/ethnic heterogeneity	0.025	(0.013)	0.07	0.024	(0.013)	0.07
Median income	-0.027	(0.012)	0.03	-0.027	(0.012)	0.03
Population density	0.000	(0.000)	0.00	0.000	(0.000)	0.00
House burglarized	-0.417	(0.251)	0.10	-0.386	(0.249)	0.12
Gangs in neighborhood	0.281	(0.255)	0.27	0.249	(0.253)	0.33

APPENDIX D
EVALUATING COVARIATE BALANCE

Appendix D. Evaluating covariate balance

	Treated		Untreated		Standardized difference:	
	Mean	SD	Mean	SD	Before matching	After matching
<i>Individual</i>						
Age (in months)	175.47	(15.66)	177.69	(17.38)	-13.4	-6.2
Age squared	31035	(5527)	31876	(6195)	-14.3	-6.5
Male	0.69	---	0.50	---	38.7	6.8
Black	0.25	---	0.26	---	-1.2	-1.5
Hispanic	0.36	---	0.20	---	35.9	2.5
Foreign born	0.02	---	0.03	---	-10.0	-4.0
Sexually active	0.56	---	0.29	---	57.5	9.2
Delinquency variety score	1.04	(1.52)	0.40	(0.91)	51.2	3.9
Body Mass Index (BMI)	22.22	(5.78)	21.94	(4.51)	5.3	-6.0
Perceptions of weight scale	2.03	(0.93)	2.13	(0.80)	-11.6	-5.2
Witnessed shooting (< age 12)	0.23	---	0.10	---	36.7	2.9
Perceptions of arrest	54.46	(40.96)	59.19	(40.53)	-11.4	-0.6
Arrested	0.16	---	0.07	---	30.5	3.7
Dating	0.75	---	0.54	---	46.3	7.2
Bullied (< age 12)	0.29	---	0.18	---	23.4	2.9
Communicative difficulties	0.08	---	0.04	---	18.4	-0.3
Annual hours worked	117.81	(525.6)	159.89	(523.0)	-8.0	-1.6
<i>Family</i>						
Household size	2.73	(1.31)	2.45	(1.28)	21.6	0.9
Teen mother	0.21	---	0.19	---	6.2	1.3
Parental education	11.22	(2.87)	12.53	(2.81)	-44.5	-5.9
One parent household	0.44	---	0.31	---	28.1	4.1
Other household	0.24	---	0.19	---	11.7	2.9
Income-to-poverty ratio	1.95	(2.14)	2.88	(2.73)	-33.0	-4.8
Family in gang	0.45	---	0.18	---	60.2	7.9
<i>Peer</i>						
Anti-social peers scale	1.61	(1.09)	1.31	(1.05)	27.5	1.4
Pro-social peers scale	2.02	(0.75)	2.05	(0.72)	-3.1	2.0
Peers in gangs scale	0.92	(1.15)	0.53	(0.93)	37.4	5.7
<i>School</i>						
Grade in years	7.36	(1.43)	7.69	(1.57)	-22.0	-7.2
Grade retention	0.22	---	0.16	---	15.2	4.8
Absences	7.46	(8.75)	4.61	(7.11)	34.7	-2.4
Tardiness	4.93	(11.53)	2.18	(6.43)	29.2	-0.6
Fights at school	0.35	---	0.16	---	44.6	8.8
Threatened at school	0.40	---	0.20	---	43.1	8.6
Belongings stolen at school	0.32	---	0.24	---	17.1	-0.5
Healthy environment index	1.24	(0.39)	1.13	(0.36)	30.6	3.9
PIAT (Peabody) math score	39.20	(30.89)	47.07	(34.53)	-21.2	-0.8
<i>Community</i>						
Poverty rate	14.32	(7.41)	14.24	(7.39)	1.1	-2.5
Percent Black	13.69	(15.39)	14.65	(15.68)	-6.2	-3.5
Percent Hispanic	14.26	(18.29)	10.37	(14.99)	23.3	1.4
Percent unemployed	7.00	(2.38)	6.75	(2.26)	10.8	0.9
Racial/ethnic heterogeneity	34.02	(19.62)	32.55	(18.41)	7.8	-2.5
Median income	35566	(9439)	35249	(8784)	3.5	2.0
Population density	3148	(8272)	2026	(5793)	15.7	0.1
House burglarized	0.17	---	0.15	---	3.6	-0.4
Gangs in neighborhood	0.65	---	0.43	---	45.1	8.5

APPENDIX E

LOWER AND UPPER BOUNDS FOR THE IMPACT OF GANG JOINING ON
EDUCATIONAL ATTAINMENT

Appendix E. Lower and upper bounds for the impact of gang joining on educational attainment (N=7,978)

	Gang to Non-Gang Differences	
	Lower Bound	Upper Bound
Highest grade completed	-0.44 * ^a	-0.82 * ^b
GED	0.4 ^a	4.8 ^c
High school diploma	-6.0 ^a	-15.7 * ^c
Post-secondary matriculation	-5.2 ^d	-11.1 * ^b
2-year degree	-1.6 ^a	-2.0 ^d
4-year degree	-3.2 ^d	-9.1 * ^b
Advanced degree	-0.4 ^b	1.7 ^c

Note: * $p < .05$. Differences are expressed in years (highest grade completed) and percentage points (remaining outcomes). Standard errors were bootstrapped with 100 replications.

^a Local linear matching (bandwidth=.02); ^b Kernel matching Gaussian estimator (bandwidth=.02);

^c One-to-one nearest neighbor matching (caliper=.01); ^d Three-to-one nearest neighbor matching (caliper=.01)

