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Los Angeles

Social Relationships and Violence Trajectories from
Adolescence through Early Adulthood into Adulthood

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Public Health

by

June Young Lim

2014

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2014

ABSTRACT OF THE DISSERTATION

Social Relationships and Violence Trajectories from
Adolescence through Early Adulthood into Adulthood

by

June Young Lim

Doctor of Philosophy in Public Health

University of California, Los Angeles, 2014

Professor Carol S. Aneshensel, Chair

Violence is a serious public health problem that is a threat to society as a whole. Even when it does not result in death, it takes a toll on victims, families, and communities. The processes by which people become violent, and then continue or discontinue being violent, are not well understood. Although it is one of the leading causes of death for people 1-44 years of age, much of the focus of violence research has focused on adolescents and the factors that contribute to the onset of violence at that stage of the life course. Less is known about patterns of violence over time and what factors contribute to its persistence and cessation. Furthermore, little is known about female violence, its patterns over time, and how it differs from male violence.

The overall goal of this dissertation is to elucidate the impact of relationships with parents, friends, and romantic partners over time on trajectories of violent behaviors from adolescence into early adulthood through adulthood. This study makes a significant contribution to the knowledge base on violence by: (1) identifying four trajectories of violent behaviors in adolescence through adulthood in the full sample and in gender-stratified subsamples, (2) explicating the effects of social relationships at different life stages on these trajectories, and (3) ascertaining the extent to which these processes differ for males and females. It is guided by important concepts from the life course perspective, attachment theory, and social control theory to explore the ways in which social relationships over time are associated with violent behaviors across these life stages. Secondary analysis of Waves 1-4 (1994 to 2008) from the National Longitudinal Study of Adolescent Health (N = 11,197) was conducted to achieve the goals of this dissertation.

There are a number of key findings from this study. First, four distinct trajectories of violence from adolescence through adulthood were identified in this dissertation in the full sample and for females and males. They are: *low desister*, *high desister*, *chronic perpetrator*, and *late escalator*. Although similar groups were found in the gender subsamples, the specific shapes and compositions of these groups vary somewhat for males and females. Second, child abuse victimization by a parent and associating with delinquent friends during adolescence increase the risk of violence and significantly distinguish violence trajectories. These negative aspects of parent and friend relationships have proximal, distal, and persistent effects on violence perpetration and were found in the full sample in males and females. Third, romantic partnerships can be both deterrents to and provocations of violence. The direction of influence

of romantic partnership depends on age, or life stage, the type of violence trajectory group a person is most likely to be assigned to, and gender. Fourth, violence victimization begets violence perpetration. Experiencing violence victimization is a very strong predictor of membership in a group that has increased or prolonged levels of violence for the full sample and for females and males. Five, the influence of certain social relationships on trajectories of violence vary by gender, emphasizing the importance of understanding how these processes vary by gender.

It is important that factors that put people at increased risk of violence be diminished, while simultaneously stimulating those that deter violence in order to decrease its pernicious and destructive reach. By elucidating the processes by which social relationships act as encouragements to or deterrents of violence at varying time points between adolescence and adulthood, this dissertation highlights opportunities for the reduction and/or prevention of violence couched within an understanding of what period on the life course might be more sensitive to intervention.

The dissertation of June Young Lim is approved.

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For my parents, who instilled in me a thirst for knowledge and who have encouraged and supported me wholeheartedly in all my endeavors.

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CHAPTER 1: INTRODUCTION

Violence is a serious public health issue because of the pervasive threat it poses to the population. This threat arises from the reach of violence: no community is untouched by it. The World Health Organization defines violence as “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation” (WHO, 2002). Violent acts are categorized into three types: interpersonal, self-directed, and collective, which is “violence inflicted by larger groups, such as states, organized political groups, militia groups and terrorist organizations” (WHO, 2002, pg.4). This study focuses on interpersonal acts of violence, which are acts of violence that are inflicted by an individual on another individual(s) (National Center for Injury Prevention and Control (U.S.), 2010; Sugimoto-Matsuda et al., 2012). The emphasis is on the social origins of violent behaviors and its course over time as adolescents develop into adults.

Youth violence is a vital concern for public health researchers because of its impact on youth development and subsequent health, adult achievement, and the public at large. It is one of the ten leading causes of death among people ages 1-44 in the United States and worldwide (WHO, 2002). It is the second leading cause of death among people ages 15-24 years of age and the third leading cause of death among young people ages 1-4, 10-14, and 25-34 (National Center for Injury Prevention and Control (U.S.), 2010). These facts and figures establish violence as a major public health problem. The prevalence of violence, the toll it exacts in injuries, deaths, and life course disruption for youth and adults alike make it critical to

examine the mechanisms by which it begins and then continues over time or ends (Dahlberg, 1998; Marcus, 2009; Winett, 1998).

Violent behaviors over time have largely been studied according to average prevalence rates which mask variations in violent offending patterns that occur among individuals. Disaggregated trajectories (e.g., non-offending, intermittent, persistent) of violent behaviors from adolescence through adulthood have not been closely examined. Moreover, any violence perpetration by females in general has been studied with far less frequency than among males, and violence trajectories among females have been researched even less often. This dissertation, in contrast, examines intra-individual stability and change in violent behaviors from adolescence through early adulthood to adulthood and whether young men and women follow similar pathways.

1.1 SPECIFIC AIMS AND RESEARCH QUESTIONS

The goal of this dissertation is to make a unique contribution to the knowledge base on violence by (1) explicating trajectories of violent behaviors in adolescence through early adulthood into adulthood, (2) assessing the effects of social relationships on these trajectories, and (3) examining the extent to which these processes differ by gender. Using the life course perspective, attachment theory, and social control theory, this study examines the mechanisms by which social relationships over time are linked to trajectories of violent behaviors over these life course stages. Secondary data analysis was conducted of four survey waves (Wave 1—1994-5; Wave 2—1996; Wave 3—2001-2; and Wave 4—2007-8) from the National Longitudinal Study of Adolescent Health (Add Health) to achieve the following study aims:

Specific Aim 1: *To identify distinct trajectories of violent behaviors from adolescence through young adulthood into adulthood (e.g., never violent; persistently violent; intermittently violent) by taking into consideration whether or not the person ever engages in violent acts, and if so, when these acts begin and when they terminate, if these acts do terminate.*

Research Questions for Specific Aim 1:

- 1A. Can the heterogeneity in violent behaviors that occurs over this developmental period be characterized by a limited number of distinct types of trajectories and if so, how many trajectories best represent this heterogeneity and how can these trajectories be described?
- 1B. Are the same trajectories found across gender or are there different sets of trajectories by gender?
- 1C. How common is each of these trajectories and is there variation by gender in which trajectories predominate?

Specific Aim 2: *To elucidate the influence of social relationships on trajectories of violent behaviors from adolescence into early adulthood through adulthood.*

Research Questions for Specific Aim 2:

- 2A. To what extent do young people's social relationships with their parents and peers during adolescence shape the course of their participation in acts of violence over time by influencing initiation, persistence, and/or cessation of such acts?

- 2B. Does the presence of some specific types of relationships (e.g., spouse) in early adulthood or adulthood function as a turning point that alters the course of violent behavior?
- 2C. Does stability and change in social relationships influence trajectories of violent behavior over time?
- 2D. To what extent is the effect of a particular type of relationship on violence trajectories independent of the effect of another type of relationship or are these effects conditional such that one relationship amplifies or dampens the effect of the other relationship (for example, does relationship with mother have unique effects on violence trajectories or is it moderated by relationships with peers)?

Specific Aim 3: *To determine the extent to which gender influences the impact of social relationships and turning points on violence trajectories.*

Research Questions for Specific Aim 3:

- 3A. Does the extent to which young people's social relationships shape the course of their participation in acts of violence over time—by influencing initiation, persistence, and/or cessation of such acts—differ for males and females and, if so, in what regards are these effects different?
- 3B. If the presence of some specific types of relationships (e.g., spouse) in early adulthood or adulthood functions as a turning point that alters the course of violent behavior, are these the same relationships and effects for males and females?

- 3C. Does the extent to which stability and change in social relationships influence trajectories of violent behavior over time differ for males and females? Are these the same or different relationships for males and females?
- 3D. Are there gender differences in whether the effect of a particular type of relationship (e.g., mother) on violence trajectories is conditional on the effect of another type of relationship (e.g., friend), and if so, how do the effects of distinct relationships operate differentially according to gender?

1.2 BACKGROUND AND SIGNIFICANCE

Violence is a major risk factor for the development of emotional and behavioral problems. Even in situations that do not result in fatal injury, victims and witnesses of violence suffer from a range of physical, sexual, reproductive, and mental health problems (such as mood disorders including depression, anxiety, and post-traumatic stress disorder) (Aisenberg & Herrenkohl, 2008). Violence places a significant burden on national economies, costing countries billions of dollars each year in health care, law enforcement, social services, victim support, and lost productivity. For instance, the cost of violence in the United States exceeds \$158 billion each year in lost productivity and medical costs alone (CDC, 2009). Violence and its adverse consequences can be reduced if the factors that contribute to the initiation, persistence, and cessation of violent behaviors over time can be understood.

1.2.1 Violence from Adolescence through Adulthood

Violence typically begins in pre-adolescence, peaks in adolescence, and drops substantially as young people approach adulthood (Dahlberg, 1998; Elliott, Huizinga, & Morse, 1986; Loeber & Hay, 1997; Marcus, 2009; Petts, 2009; Piquero, Carriaga, Diamond, Kazemian, & Farrington, 2012; Powell, Perreira, & Harris, 2010; Sampson & Laub, 2003; Stouthamer-Loeber, Wei, Loeber, & Masten, 2004). Elliott and colleagues (1986) found that serious violent behaviors peak at ages 16-18 followed by declines throughout the 20s. This finding has led to an emphasis on violence among adolescents, obscuring the fact that serious forms of violence (acts that cause greater injury and/or death) typically are higher among young adults than adolescents (Loeber & Hay, 1997; Marcus, 2009; Piquero, Farrington, & Blumstein, 2003). This greater harm is the result of an increase in physical strength, the use of weapons, and the lethality of weapons used. Homicide rates in particular are much higher in young adulthood than in adolescence (Blumstein, Rivara, & Rosenfeld, 2000).

Studies of violence and aggression have consistently found a strong correlation between child, adolescent, and adult aggression, however there also are large individual differences in the stability of aggression over these developmental stages (Piquero et al., 2012; Sampson & Laub, 2005). For instance, most aggressive children are not aggressive as adults, and some individuals begin violent behaviors in adulthood without a previous history of violence (Loeber & Southamer-Loeber, 1998). Evidence from longitudinal studies shows that although only a minority of violent offenders lacks a pattern of antecedent aggression (Loeber & Hay, 1997; Loeber & Southamer-Loeber, 1998), the onset of adult offending should not be neglected. Thus, studies of violence should not be limited to adolescence, but also cover the time periods

of early adulthood and adulthood to better represent violence patterns that exist in the population.

1.2.2 Trajectories of Violence over Time

There is recent and growing interest in public health developmental perspectives on criminal behaviors which subdivide the offender population into different categories or pathways (trajectories) and assume different causal influences for each trajectory (Sampson & Laub, 2005). A recent review of over 80 studies by Piquero (2008) on *crime* trajectories examined general criminal offending and delinquent behaviors, such as vandalism, hitchhiking, running away from home, cigarette and alcohol use, and contacts with polices/arrests. Although some of the studies included patterns of serious offending including violence, violence was not the sole behavior or focus of any of the studies included in Piquero's review. Little is known about trajectories of violent behaviors, therefore literature on criminal offending is summarized here as a proxy for violence because there is more information about criminal offending than violence.

Piquero (2008) found that three to five different offender groups tend to be identified, on average, for the periods between adolescence and adulthood. Across numerous studies, there are at least two trajectories: an adolescent-peak pattern (i.e., adolescent limited) and a chronic offender pattern (i.e., life-course persistent) based on Moffitt's classic and parsimonious taxonomy (Moffitt, 1993; Moffitt, Caspi, Harrington, & Milne, 2002; Nagin, 2005; Piquero, 2008). More current empirical research indicates that more than these two groups exist in the population. Studies that trace criminal trajectories beyond adolescence and into

adulthood have revealed a group of late-onset offenders—those who begin to offend in late adolescence/adulthood with no prior reports of criminal behaviors (Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002; Piquero, 2008; Sampson & Laub, 2005). Other groups that have been identified are a non-offending group and an intermittent (i.e., zigzag) pattern of offending group, but these groups have been understudied (Piquero et al., 2003). A recent study on male violence using the Add Health data identified 3 trajectories of violence from ages 13-32: non-violent, desisting, and escalating (Reingle, Jennings, Lynne-Landsman, Cottler, & Maldonado-Molina, 2013). The current study goes beyond this one by contrasting young men and woman and by identifying social determinants of violence trajectories.

Many previous studies have placed people into groups of criminal offending patterns based on *a priori* assignment rules where categorization standards were set in advance according to pre-selected cut-off points or criteria. Moffitt's classic taxonomy of antisocial behavior was an *a priori* categorization of scores on a conduct behavior index according to means and standard deviations in self-reported delinquency (Moffitt, 1993). Sampson and Laub (2003) also used predetermined standards applied to criminal history records to classify men into different crime patterns: persistence, desistance, zigzag, late desistance, and late onset. New methodological tools have used statistical methods to place individuals into groups rather than setting arbitrary standards; however, research on these patterns generally applies to criminal and delinquent offending, not violence *per se*.

Although there has been an increase in the identification of different groups of offenders in the literature, little is known about the causal processes that underlie the continuation and discontinuation (i.e., desistance) of criminal activity (Bushway, Thornberry, &

Krohn, 2003; Sampson & Laub, 2005), especially in regards to violence (Loeber & Hay, 1997).

Existing studies generally describe the onset and duration of offending, but pay less attention to actually *explaining* differences in these existing patterns (Stouthamer-Loeber et al., 2004). The Add Health study by Reingle and colleagues (2013), for example, considered only adolescent risk factors and their association with violence trajectories, and did not look at factors in early adulthood or adulthood that could potentially differentiate violence patterns. Thus, the processes by which desistance versus persistence occurs requires further investigation.

Most of the studies that consider processes around desistance primarily focus on delinquency rather than violence. Research on the desistance of criminal behaviors, including violence, is challenging because of measurement and operationalization difficulties (Piquero et al., 2003; Stouthamer-Loeber et al., 2004). One issue is a lack of a standard operationalization of desistance, for example—the time period over which a person has to not partake in a behavior to be considered to have desisted from it (Stouthamer-Loeber et al., 2004). Many studies have used what Bushway and colleagues (2003) describe as a “static” definition of desistance where there is a specified time cut point such that persons who do not offend until that cut point are considered to have desisted. However, this approach is not sensitive to individuals whose offending behaviors are intermittent or those who stop offending after the arbitrary cut point. Others define desistance as an individual stopping the commission of that behavior entirely and permanently (Stouthamer-Loeber et al., 2004).

1.2.3 Effects of Social Relationships on Violent Behaviors at Different Stages of Development

Violent behavior has been hypothesized to develop and to be maintained within the context of social interactions (Dishion, Eddy, Haas, Li, & Spracklen, 1997). Among the most significant factors related to behavior are people's interactions with others in their environment and daily settings. The importance of social relationships for development stems from the fact that people's behaviors do not develop in isolation from others (Reese, Vera, Simon, & Ikeda, 2000), thereby demonstrating that knowledge about the influence of social relationships is critical to understanding behaviors. Specifically, relationships such as the family and peer group, are integral in accentuating or decreasing young people's risk for violence perpetration (Haynie, Silver, & Teasdale, 2006; Simons-Morton, Hartos, & Haynie, 2004). While research has heavily focused on social relationships directly linked to adolescent behaviors, there have been few studies on the impact of social relationships in stages of development after adolescence that pertain to violence (see (Herrenkohl et al., 2000; Laub & Sampson, 1993; Marcus, 2009; Petts, 2009; RÖNKÄ, Oravala, & Pulkkinen, 2002; Stouthamer-Loeber et al., 2004) for exceptions as discussed below).

The transition period from adolescence to adulthood, which some researchers have termed "emerging adulthood", is filled with frequent changes and explorations in love, work, worldviews, and life directions (Arnett, 2000). This transitional period offers various experiences for the first time: being out of direct control of parents and guardians, moving out of one's parents' home, entering the labor force, becoming economically independent, and the forming one's own family through marriage and/or child-bearing (Arnett, 2000; Massoglia & Uggem, 2010; Shanahan, 2000). Social ties and influential people outside of the family become

increasingly important in shaping an individual's identity and behaviors during this stage (Call et al., 2002) How these relationships shape people's involvement with violence, however, has received only limited attention.

Parents. Scholars generally agree that much of young people's socialization takes place in the family (Gerard & Buehler, 2004b; Petts, 2009). Families are considered important supportive influences in adolescence and young adulthood in preventing risk-taking behaviors that are common during this developmental period (Reese et al., 2000; Sommers & Baskin, 1994). The family—especially parents as primary caregivers—is regarded as one of the most critical social influences in adolescent violence prevention (Banyard & Modecki, 2006; Brendgen, Vitaro, Tremblay, & Wanner, 2002; Earls & Carlson, 2001; Herrenkohl et al., 2000; Leiber, Mack, & Featherstone, 2009; Loeber & Hay, 1997; Piquero et al., 2003).

Family environments that are protective against youth delinquent behaviors are comprised of a nurturing parent and high quality relationships (e.g., emotional support, consistent and fair discipline (McCord, 1991; Reese et al., 2000), parental involvement, monitoring (Ingram, Patchin, Huebner, McCluskey, & Bynum, 2007), and warmth (Banyard & Modecki, 2006; Blum, Ireland, & Blum, 2003; Ingram et al., 2007). Blum and associates (2003) and Resnick and colleagues (2004) found that parental connectedness is a statistically significant protective factor against violence perpetration for females but not males. Specifically, Resnick and colleagues (2004) found that the ability to discuss problems with parents was the only significant protective family factor for males.

Family systems also can put youth at risk for violence perpetration when there is violence exposure in the home, child abuse and maltreatment, lack of parental supervision,

harsh or inconsistent discipline, and physical punishment (Banyard & Modecki, 2006; Gerard & Buehler, 2004a; Loeber & Hay, 1997; Reese et al., 2000). The absence of emotional support from families is a risk factor for violent offending among both boys and girls (Molnar, Roberts, Browne, Gardener, & Buka, 2005).

Generally, the impact of family relationships on violence has been considered solely during adolescence and few studies have looked at the effect of family relationships on violence in early adulthood and adulthood. The potential long-term effects of parent-child relationships on violent behaviors have not been studied extensively either. In one such study, McCord (1991) found that mothers who were non-punitive in discipline and affectionate during adolescence were protective against delinquent behaviors for males during adolescence, but not in adulthood. It may be that during the transition into adulthood people outside of the family become increasingly important in shaping an individual's identity and behaviors (Call et al., 2002). Therefore, it is important to explore social relationships outside of the family in addition to the effect of ongoing family relationships on violence behaviors over time.

Peers. Peer relationships are central to the study of adolescent behaviors because young people spend a significant amount of time with their friends and attribute great importance to them during this period (Dahlberg, 1998). Since adolescence is a time in the developmental life span when young people enjoy increased freedom and decreased supervision by adults, there are more opportunities for participation in negative behaviors—such as violence. Further, because adolescents often spend more time with their peers than parents, there can be a rise in impulsive risk-taking behaviors and crime (Agnew, 2003; Loeber & Hay, 1997). Peers have been recognized as exerting significant influences on violent

behavior, especially during adolescence (Dorothy Bottrell, 2009; Brendgen et al., 2002; Dominguez & Arford, 2010; Henry, Tolan, & Gorman-Smith, 2001; Herrenkohl et al., 2000; Reese et al., 2000) when deviant peer groups are thought to form, deviant behaviors become more normative, and simultaneously, adult influences begin to diminish (Dishion et al., 1997; Hagan & Foster, 2001; Ingram et al., 2007). Further, many delinquent acts during this developmental stage are performed with peers and not by oneself (Brendgen et al., 2002).

Young people involved in delinquent behaviors, such as violence, often gravitate to antisocial peers who accept and encourage their tendencies (Loeber & Hay, 1997). These delinquent networks may appear “attractive” and “glamorous” to previously non-violent youth, and can contribute to the late onset of aggression (Moffitt, 1993). Such friendship networks are vehicles for perpetuating “delinquent traditions” and “violent youth cultures” that contribute to violence in adolescence (Haynie & Payne, 2006) because they provide normative support for delinquent behavior, “egging on” of negative behavior, and increased opportunities for such behaviors (Haviland & Nagin, 2005). A study of male adolescents from the Oregon Youth Study, for example, found that deviancy talk with peers was significantly associated with both delinquency self-reports and official arrest data, over and above the influence of child antisocial behaviors and parental discipline (Dishion et al., 1997). Even though respondents’ particular friends changed on the three occasions when they were brought in to the study site for observation, the friends’ characteristics and the nature of the relationships were similar. This study shows the strength of the influence of peers in the behaviors of young people while simultaneously demonstrating that youth gravitate to other youth that promote their antisocial or prosocial tendencies. Haynie and Payne (2006) found that spending increased time with

bad-tempered, deviant, and violent peers significantly increased respondents' risk of violence perpetration in adolescence for a nationally representative sample of high school students. These findings point to the importance of including peer influences when studying the impact of social relationships on violent behaviors.

Although studies of peer influences have primarily focused on adolescence, a few studies have linked peers to violent behaviors in early adulthood. Herrenkohl and colleagues (2000) found that having delinquent peers at ages 14 and 16 years of age independently and significantly increased the odds of violence perpetration at age 18. Similarly, in a longitudinal study of delinquency, having peers with high levels of delinquency in adolescence (13-16 years old) and late adolescence (17-19 years old) was significantly associated with the persistence of violent behavior for men into young adulthood (ages 20-25 years) (Stouthamer-Loeber et al., 2004).

One area that has not been explored in detail that could provide a different lens for viewing peer influences is positive or prosocial peers, instead of delinquent ones, and their impact on violence prevention or desistance. Haynie and Payne (2006) found that having academically oriented friends was protective against violence perpetration, even when peer deviance was taken into consideration. Stouthamer-Loeber and colleagues (2004) found that having good relationships with peers in adolescence (13-16) was significantly associated with desisting from serious delinquency in young adulthood (20-25).

These studies provide a foundation for examining peer influences on violent behavior in adolescence and as it continues or ceases later in life.

Family and Peers. When considering social influences on young people's lives, it is important to understand the ways in which different types of relationships are linked together, such as family and peers. The relative influence of family versus peers on adolescent behaviors has been long debated. Although there have been attempts to integrate peer and family effects in the study of delinquency (Ingram et al., 2007), researchers differ in their conceptualizations regarding the mechanisms by which the family and peer relationships work to shape violent behaviors among adolescents and young adults. Many studies suggest that effective parenting and strong bonds with parents protect youth against deviant peer influences (Herrenkohl et al., 2000; Shetgiri, Kataoka, Ponce, Flores, & Chung, 2010). Conversely, when there is a lack of parental support and control, there are increased opportunities to be involved with delinquent peers (Henry et al., 2001; Smith, Flay, Bell, & Weissberg, 2001).

Henry and colleagues (2001) examined the joint effects of family types, peer violence, and peer delinquency on violence and delinquency in adolescent boys. They created a family typology from a cluster analysis of family and parenting variables: exceptionally well-functioning; task-oriented; moderately well-functioning; or struggling. Family type was significantly associated with peer violence, which in turn was significantly associated with violence perpetration. Exceptionally well-functioning families—defined as high levels of parenting practice and emphasis on the importance of family—significantly protected young people from having deviant peers and from participating in violence and delinquency. Adolescents from struggling families—defined as low levels of parenting practices; low levels of

warmth, cohesion; low family importance—were at increased risk of violence and having violent friends.

In a qualitative study of delinquent adolescent females, Molnar and colleagues (2005) found that almost every respondent reported that family and friends helped them keep away from risky environments, stay out of trouble, and avoid getting into fights by being supportive, providing guidance, and pointing out right from wrong. While many of the females in this study cited the importance of friends as sources of support, there were more reports of family support. Specifically, the young women emphasized that their relationships with their mothers were key in helping them stay out of further trouble and danger. They also stated that other young people in their neighborhood needed more guidance from their parents because the absence of parental encouragement resulted in violent behaviors.

Other Adults: Mentors. Only a few studies have looked at the impact of adults outside of the household on adolescent behaviors. There is some evidence, however, that adults other than the primary caregivers, e.g., mentors, influence violent behaviors (McNulty & Bellair, 2003b; Resnick, Ireland, & Borowsky, 2004). For example, McNulty and Bellair (2003) found that youth who interacted with adults in their neighborhood during adolescence were at significantly lower risk of violence compared to those who rarely or never interacted with neighbors. Resnick and colleagues (2003) found that feeling connected to adults outside of the family in adolescence is a protective factor against violence perpetration. However, Herrenkohl and colleagues (2000) found that the presence of neighborhood adults involved in crime was significantly related to violence perpetration at age 18. This study does not specify whether or not it was just the mere presence of the adults, or if it was interacting with crime-involved

adults that influenced the young people's behavior. Little is known about the impact of adults outside of primary caregivers, thus further evaluation can provide more insight about their role in violent behaviors in young people.

In the transition from adolescence to adulthood, the presence of a mentor-like figure, such as an employer, can serve as a positive role model in promoting prosocial behaviors. Based on analysis of qualitative interviews with former male criminal offenders, Laub and Sampson (1993) found that adult social bonds have important effects on criminal behaviors. During early adulthood and adulthood, relationships formed with co-workers or supervisors can provide positive influences on behaviors. These investments in relationships at work act as a deterrent to delinquent behaviors. The men who reported strong ties to work and family participated in less crime and deviance than those who lacked such ties. The importance of these relationships specifically on violence desistance, however has not been examined. Therefore, investigation of the effects of other adulthood relationships on violence should be considered.

Romantic Partners/Spouses. Positive impacts of marriage on desisting from delinquency in young adulthood and adulthood have been reported (Laub & Sampson, 1993; Marcus, 2009; Petts, 2009). For instance, Laub and Sampson (1993) conducted qualitative interviews with a subset of White delinquent men selected from a Massachusetts correctional system who appeared to have desisted from crime. Men who displayed high job stability or marriage stability in combination with no arrest records were selected for interviews. Many of the selected men reported that their marriage was related to their decline in negative behaviors (Laub & Sampson, 1993). In a qualitative study of young offenders, new dynamics in

interpersonal relationships, such as finding a supportive partner or separation from a negative partner, were found to be positive turning points for young adults (RÖNKÄ et al., 2002). Marcus (2009) found that being married in early adulthood was associated with a 41% and 45% reduction in violent acts compared to adolescence for men and women, respectively. Engaging in family roles, such as that of a spouse, has been found to be pivotal in desisting from crime. Most of the findings are based on qualitative or retrospective cross-sectional studies, however, which limit the generalizability of the findings. Therefore, studies using longitudinal data from probability samples of the population need to be conducted in order to establish whether there is a causal effect of a romantic partner or spouse on one's desistance from violent behaviors.

1.2.4 Gender and Violence

At any age, male participation in serious crime is always greater than female – this is especially so for serious violence. The range for the prevalence of violence is large because the magnitude of violence perpetration varies depending on the source of data. Some studies rely on official crime statistics based on arrest reports whereas others are based on surveys. Regardless of the source of data, the violence rate for males is higher than that for females. Studies consistently report that 15-30% of girls, compared to 30-40% of boys, in the U.S. have committed a serious violent offense by age 17 (United States. Public Health Service. Office of the Surgeon General., 2001). Elliott (1986) found that the prevalence at age 27 for ever-committing a serious violent offense was 42% for males and 16% for females. In a study of young adults aged 18-25, the overall prevalence rate was 4.3% for young women and 18% for young men, pointing to strong gender differences in that violence in early adulthood is

somewhat rare for females, but high for males (Marcus, 2009). As a result of these differences, many researchers do not include women as part of their sample in studies of violence (Englander, 2007). However, according to the Federal Bureau of Investigation and its annual Uniform Crime Reports (UCR), girls have had substantial increases in violent incidents from 1980 to 2000, specifically for simple and aggravated assault. Moreover, there has been an increase of arrests from 21% (1980) to 33% (2000) for simple assault and from 15% to 24% for aggravated assault (Steffensmeier, Schwartz, Zhong, & Ackerman, 2005).

Elliott (1986) examined the first eight waves of the National Youth Survey (NYS) and found that the peak age in serious violence was earlier for females than males and that the subsequent decline was steeper among females. The gender differential for violence prevalence increased with age. For example, at age 12 the male to female ratio was 2:1 and by age 21 had increased to 4:1. Marcus (2009) found similar gender differentials in violence prevalence with boys 230% more likely than girls to be violent offenders during adolescence and 530% more likely to be violent offenders in early adulthood. These findings show that trajectories of violence likely differ by gender.

Despite the lower rate of violent offending, studies on female violence need to be undertaken because violent females pose a threat to the safety of others and the rate at which they commit violent offenses is still substantial. Since the bulk of previous research on violence has been largely based on men, studies of females need to be undertaken to uncover trajectories of violence and identify predictor variables. In a study of gender differences in risk factors for delinquency, Booth and colleagues found that young men and women take different pathways in their involvement in violence; they conclude that there needs to be an increase in

both theoretical and practical understanding of the influences on acts of delinquency among males and females (Booth, Farrell, & Varano, 2008). The same gap exists regarding knowledge about how protective and risk processes of social relationships may differ according gender.

1.3 THEORETICAL FRAMEWORK

The theoretical framework for this study is based on three main sources: the life course perspective, attachment theory, and social control theory.

1.3.1 Life Course Perspective

The life course perspective views development as a lifelong process that is linked to the formative years of childhood (Elder, Johnson, & Crosnoe, 2003). It considers social relationships and the contexts in which socialization occurs as important for individual development (Gecas, 2003). The life course perspective recognizes that although there is stability in people's behaviors throughout the life span, there are many opportunities for behavioral change through the transitions people encounter in their lives. This is an ideal perspective from which to view violence persistence and desistance over time because of its emphasis on the power of social relationships and opportunities to redirect previous choices and behaviors (Sampson & Laub, 2003). Further, the concept of human agency—that is, the idea that individuals construct their own life course through the choices they make and the actions they take within the opportunities and limitations of their social circumstances—is optimistic and empowering because it emphasizes that people make active choices in their daily lives and because it directs attention to factors that can help people who have been engaged in violent acts to desist. However, acknowledging that individuals also are limited by

their circumstances is a realistic way of viewing the constraints that people's situations impose on "choices".

The life course perspective emphasizes that people do not develop in a social vacuum (Laub & Sampson, 1993), but rather within a network of shared relationships and interdependent lives that impact each other. This concept of "linked lives" is especially relevant to thinking about how social relationships impact people throughout the lifespan. It means that people are connected to one another and that the people with whom one is connected affect socialization and development. The family is an important force in setting the foundation for a young person's social context (Gecas, 2003; Uhlenberg & Mueller, 2003). Responsive familial interactions promote the development of one's competence (Gecas, 2003), which is critical to human agency. Among social relationships in young people, peers are also major influences. During adolescence, peers often reinforce continuity of behavior because young people gravitate to others who promote their existing tendencies when forming peer groups (Loeber & Hay, 1997)—prosocial youth tend to group together and antisocial youth often affiliate.

Another key concept in the life course perspective is social pathways, or the trajectories individuals follow, that have implications for development (Elder et al., 2003). Elder and colleagues (2003) describe these social pathways as sequences of roles and/or experiences that are made up of transitions. Transitions from adolescence to adulthood provide opportunities for considerable continuity and discontinuity in trajectories of health and behavior that have lifelong implications in shaping later events and opportunities (Haynie, Petts, Maimon, & Piquero, 2009; Macmillan & Hagan, 2004; Schulenberg, Maggs, & O'Malley, 2003). Leaving the

parental home, going to college, and joining the work force are important transitions at this stage of the life course.

Transitions that are catalysts for substantial changes in the direction of one's life are considered "turning points". Turning points have been described as experiences or events that "knife off" the past, provide opportunities for personal growth, and create chances for investment in new relationships for social support, extension of social networks, and identity transformations (Elder, et al., 2003; Sampson & Laub, 2005). Turning points are found to be particularly critical in the desistance of delinquent behaviors (Marcus, 2009). A new attachment or bond to a conventional person, such as a spouse or employer, during the transition into adulthood has been found to be important in redirecting trajectories of negative behaviors such as violence towards desistance (Laub & Sampson, 1993; Sampson & Laub, 2003). Strong ties to work and family during early adulthood and adulthood through new relationships offer growth, supervision, monitoring, and structure to daily activities (Sampson & Laub, 2005). Likewise, a new relationship, or event during these transitional periods can also direct nonviolent trajectories toward a negative path, which can lead to the onset of violent behaviors.

1.3.2 Attachment Theory

Attachment theory places considerable emphasis on early social relationships and their impact on behavioral outcomes in adolescence and adulthood. Secure attachments, the gold standard for optimal development, are developed when parents are attentive to their children's behaviors, emotions, and signals and respond appropriately to such displays (Ranson

& Urichuk, 2008). Parents' responsiveness provides a secure base from which a child feels safe to explore and a source of reassurance when the child is distressed and frustrated (Grossmann, Grossmann, & Kindler, 2005; Stroufe, Egeland, Carlson, & Collins, 2005). Securely attached young people have a sense of balance and ability to control and manage negative emotions; they have an understanding that feelings of distress can be resolved. Secure attachments also promote the development of social-emotional competence and interactional skills in young people that can be applied to new settings and relationships and to the many physical, cognitive, and social transformations that occur during adolescence (Ranson & Urichuk, 2008; Steele & Steele, 2005).

In contrast, insensitive caregiving—when parents respond unpredictably or in intrusive or hostile manners—leads to insecure attachments, which tend to leave children in prolonged states of anxiety, distress and confusion that impairs many aspects of later behavior and health (Lansford et al., 2007; Ranson & Urichuk, 2008). Young people with insecure attachments to their parents have been found to respond with outbursts and violence in times of interpersonal conflict (Dahlberg, 1998; Loeber & Hay, 1997). They are more likely to be aggressive or start fights when faced with emotional challenges or unmanageable feelings of distress because they tend to lack social skills (Ranson & Urichuk, 2008; Stroufe et al., 2005). They have also been found to experience higher rates of rejection by peers (Ranson & Urichuk, 2008).

Although attachment research emphasizes the idea that the provision of a secure base by parents arises early in life and remains a significant force throughout later development, there also are influential relationships that lie outside of the family. In adolescence and in the transition to adulthood, young people tend to withdraw their attachments from parents and

shift their attachments to peers and intimate relationships (Hagan & Foster, 2001). Despite this shifting away from parents, the parental attachment experience has been found to affect the development of these other relationships. These social relationships will reflect the “working models” of the person, which are representations and expectations for interactions that influence the capacity to make affectional bonds, and that were developed from early experiences with their parents (Ranson & Urichuk, 2008; Stroufe et al., 2005).

Overall, although research findings support the continuity of attachment patterns across relationships from infancy to adult life, stability is reported to be moderate at best (Ranson & Urichuk, 2008). In a meta-analysis of studies with longitudinal data, Fraley (2002) found that attachment representations developed early on continue to shape interactions throughout the lifespan (correlation coefficient of 0.39), but that environmental influences, such as major changes in the family environments (Steele & Steele, 2005) and challenging life events (Crowell & Waters, 2005), can change outcomes. For example, infants with insecure attachments that experienced subsequent sensitive caring were found to have more positive social and emotional outcomes than those with secure attachments who experienced subsequent insensitive caring (Fraley, 2002). In particular, movement from insecurity towards security is associated with positive feelings about attachment elements in their current (adult) relationships, as well as to alternative relationships. The transition into early adulthood and adulthood can offer opportunities for change in existing attachment patterns through new relationships, which may exert positive relationship experiences that lead to change towards prosocial behaviors. Alternately, new relationships and events can negatively influence behaviors from non-violence to violence as well.

1.3.3 Social Control Theory

Social control theory emphasizes the importance of social ties and bonds and states that delinquency is a result of an individual's weak attachment to others and society (Hirschi, 1969). An individual's relationships to conventional people set the stage for conforming to the norms of society and its institutions (Leiber et al., 2009). Attachment is one of the key concepts in social control theory. This bond of affection for a conventional person is considered a major deterrent to crime because forms the foundation for conforming to societal norms (Leiber et al., 2009).

The stronger the relationship to a conventional person, the more likely it is that a person will take the relationship into account before partaking in a delinquent act—primarily to avoid potential embarrassment, shame or inconvenience that may result if the person finds out about the delinquent behavior. The more attached individuals are to conventional persons, the more internal control they have over their behavior. As a result, they will be concerned with the opinions of others, committed to behave in acceptable ways, spend time and energy to behave as expected, and accept normative principles as valid.

Even though social control theory is eclectic regarding which institutions are considered most important for attachment (e.g., family, nation, school, peers), it places particular emphasis on parents. Parents serve as the basis for socialization processes that lead to the internalization of norms and the acceptance of notions of appropriate conduct. When young people form positive attachments to parents, conformity and self-control can be induced to insulate them from deviant influences and they are less likely to engage in behaviors that will disappoint their parents (Ingram et al., 2007). Sokol-Katz and Dunham (1997) report that norm

violation is attractive and exciting in general; however, youth with the proper internal controls will not participate in deviant behaviors because they will not yield to their impulses as much as those who do not have internal controls.

Ineffective parenting and attachment to unconventional parents and other people can lead to weak and ineffective bonds that contribute to low self-control in young people, which thereby leads to involvement in delinquency and violence (McNulty & Bellair, 2003b; Petts, 2009). Low social control reduces barriers to risk taking; people with low social control are considered less inhibited about participating in risky behaviors, such as violence (Marcus, 2009). Moreover, if there is a lack of attachment to their caretakers, then young people have impaired capacity to attach to others (Travis Hirschi, 1969).

If effective controls are set in place in childhood, then there should be continuity in prosocial behaviors from childhood to adulthood, barring transformative events. If effective social controls are not developed in childhood through early parent-child attachment, then there is substantial continuity of antisocial and delinquent behavior from childhood to adulthood (Travis Hirschi, 1969). This attachment experience extends to relationships with other family members, teachers, peers, and social institutions, such as school and extracurricular organizations/activities during adolescence. During early adulthood, the conventional bonds that can serve as positive attachments are marriage and one's commitment to educational and occupational goals (Laub & Sampson, 1993; Marcus, 2009).

1.4 CONCEPTUAL MODEL

Despite their distinct viewpoints, the life course perspective, attachment theory, and social control theory have components that complement each other and are used here to create an integrative model to explain the impact of social relationships on trajectories of violent behavior from adolescence through early adulthood into adulthood. Figure 1.1 displays the conceptual model for this study. It draws from these important concepts and themes—such as attachment, institutionalization of norms, and turning points—in conceptualizing how relationships influence behaviors at different developmental stages.

Although the three theories differ in the specific ways by which parent-child relationships are thought to lead to violent behaviors, they all emphasize the importance of the parent-child relationship. As such, the conceptual model posits that the attachment relationship between young people and their parents is related to many aspects of their lives throughout the course of time. While this study does not include early childhood, this stage is included in the model because it is considered the foundation for later stages of development. In attachment theory, the bond between a parent and child is paramount. Social control theory specifically identifies the strength of this relationship as the most important factor in determining whether or not a person will engage in violent acts (Leiber et al., 2009). According to the life course perspective, the early parent-child attachment experience is essential to the development of human agency, which is crucial to an individual's ability to exercise choice and to take action on opportunities that arise. This is pertinent to decision-making about participating in violence or not. Further, this early attachment relationship socializes children

into having the skill and the ability to handle stress, which may deter violence when conflict arises.

The conceptual model in Figure 1.1 also shows that the parental relationship is the base from which expectations and interaction patterns for later key social relationships will be established. It illustrates that parental relationships affect the relationships that young people have with their peers and the types of peers they will associate with. Relationships with peers are particularly relevant and influential during adolescence and are thought to reinforce existing tendencies and behaviors (Dishion et al., 1997; Laub & Sampson, 1993; Reese et al., 2000).

These three theories are alike in positing that young people tend to congregate with peers who reflect similar beliefs and behavior as themselves: delinquent youth have delinquent friends (Dishion et al., 1997; Hirschi, 1969; Laub & Sampson, 1993; Loeber & Hay, 1997; Reese et al., 2000). Attachment theory posits that insecurely attached children lack social-emotional competence and skills to interact appropriately with other young people, and are thereby less likely to be engaged by peers and more likely to start fights (Ranson & Urichuk, 2008). On a related note, social control theory suggests that when delinquent young people partake in norm-violating activities, they become more alienated from those who do conform to conventional standards (Hirschi, 1969). Due to rejection by their peers, some aggressive youth form alliances that foster the emergence of aggressive peer groups and gangs (Loeber & Hay, 1997).

New bonds formed during the transition from adolescence to adulthood can serve as turning points because they provide opportunities to create new attachment experiences and

interactions. The elements of social control theory and the life course perspective converge on the idea that when individuals engage in conventional activities—such as marriage, education, and work—there may be changes in the trajectory of various aspects of their lives, including participation in violence. The changes in the quality of social bonds that can be experienced through marriage and stable employment can contribute to the deterrence of violence, even among people who engaged in violence at a young age (Marcus, 2009; Petts, 2009; Sampson, Morenoff, & Raudenbush, 2005). Attachment theory also supports the notion that changes in attachment styles can occur due to changes in the social environment, such as marriage (Steele & Steele, 2005). Negative encounters, however can set a positive trajectory towards a negative turn. The life course perspective argues the significance of understanding how experiences and relationships in adolescence and adulthood impact continuity and change of behavioral trajectories across time, in the case of this study, violence trajectories over time.

1.5 CONCLUSION

This study addresses an important public health issue that affects the population at large. Violence, including the threat of violence, has a detrimental impact on people who are directly and indirectly exposed to it. In addition to lethal violence, non-lethal violence also leads to significant physical and emotional impairments and life course disruptions. Therefore, it is a serious issue that needs to be better understood and addressed. By drawing from attachment theory, social control theory, and the life course perspective, this study seeks to address notable gaps in the existing literature.

First, this study looks at the evolution of violent behaviors over four time points using a nationally representative sample of male and female adolescents that has been interviewed multiple times from adolescence through adulthood. Second, this study includes females to better understand patterns and correlates of female violence and how they differ from male violence, whereas existing research is largely limited to males. Third, this study identifies and examines distinct trajectories of violent behaviors that provide a more comprehensive view of the development of violent behaviors than in existing research. Finally, previous studies that have looked at social relationships have examined the impacts of parents and/or peers, but rarely other relationships that are known to influence behaviors. This study looks at the effects of parents and peers, but additionally includes romantic partners and adult mentors who may affect stability and change in behavior over the life course.

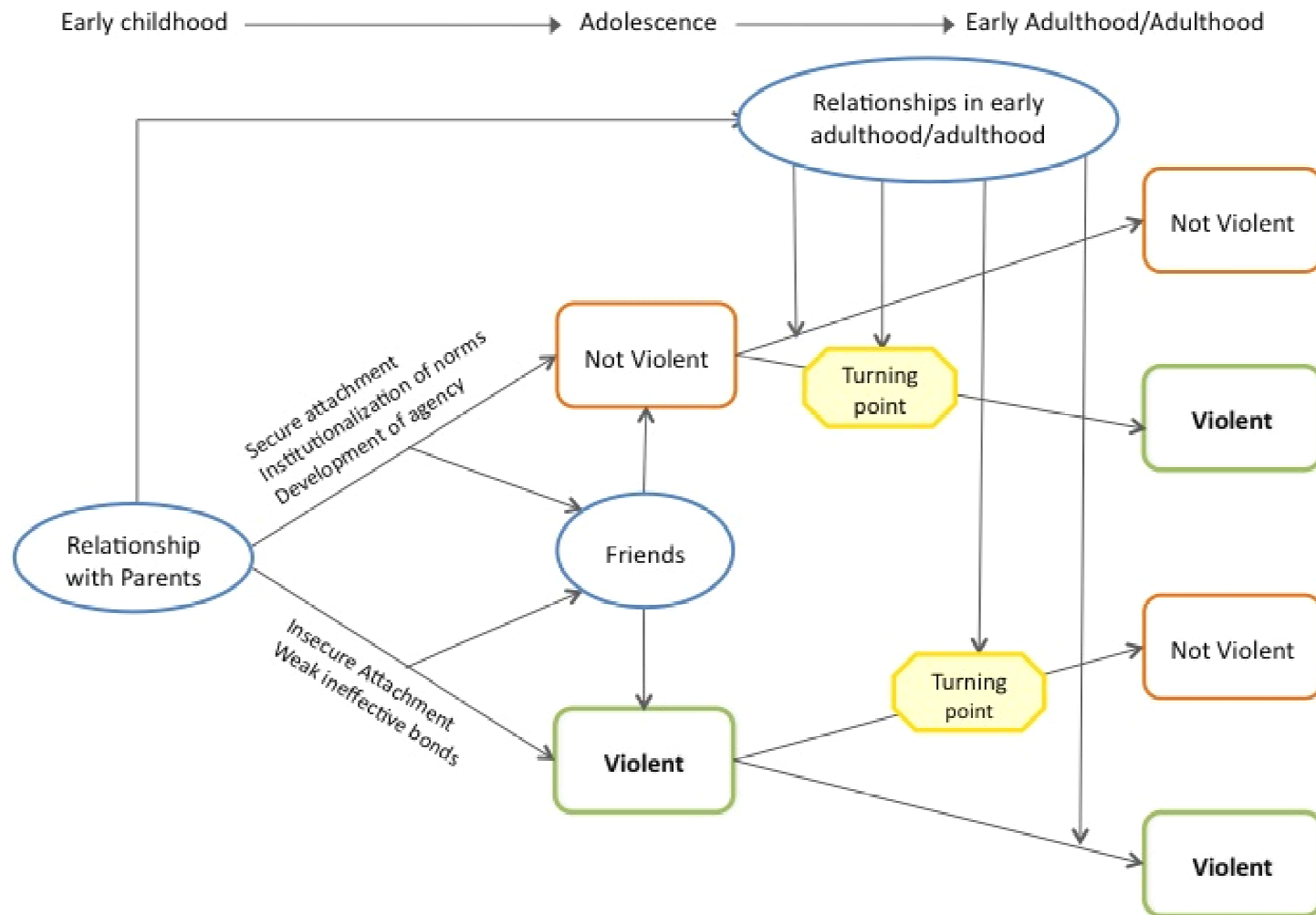


Figure 1.1 Conceptual model of social relationships and violence perpetration in adolescence through adulthood

CHAPTER 2: METHODS

This chapter presents the research methods used in this study. Secondary analysis of data from the National Longitudinal Study of Adolescent Health (Add Health) was used to examine the influence of social relationships on trajectories of violent behaviors over time. The Add Health study contains a wealth of information relevant to understanding the numerous social relationships and experiences that converge to put people at risk for, or offer protection from, engaging in violent acts from adolescence through adulthood. Specifically, the study collected data about the quality and nature of respondents' relationships with parents/caretakers, peers, and romantic partners. It also provides concrete measures of violence perpetration over time. Thus, the study contains measures of the key constructs in the conceptual model for this study.

The longitudinal panel design of the study is ideal for examining how social relationships affect trajectories of violence during the transition from adolescence to adulthood. This is important because existing research on violence indicates that longitudinal research designs are optimal for examining how the interaction of risk and protective factors changes over time (Rew & Horner, 2003). This chapter describes the Add Health study, operationalizes key constructs, outlines the composition of the analytic sample, and delineates the analytic plan for each study aim.

This dissertation has received Institutional Review Board approval from the UCLA Human Subjects Protection Committee (IRB#10-001106).

2.1 DATA – NATIONAL LONGITUDINAL STUDY OF ADOLESCENT HEALTH

2.1.1 Sample

The baseline Add Health study sample was designed to yield a nationally representative sample of students in grades 7 through 12. The study used a multi-stage stratified cluster sample design starting with 26,666 eligible U.S. high schools that were stratified by region, urbanization, school size, school type (public, private, parochial), and ethnicity (Kaufman et al., 2006; Maney, Vasey, Mahoney, Gates, & Higham-Gardill, 2004). Eligible high schools included an 11th grade and had more than 30 students. Seventy nine percent (79%) of the schools agreed to participate in the study. Eighty (80) high schools and 52 feeder schools (i.e., middle or junior high school) participated in the survey. Figure 2.1 illustrates the sampling framework for the Add Health Study (source: (Harris, 2011)). Between September 1994 and April 1995, in-school self-administered questionnaires were completed by over 90,000 students and 144 school administrators from the sampled schools.

Among the students who completed the in-school survey, a random sample of adolescents stratified by grade and gender were selected for Wave 1 in-home youth and parent interviews (Sieving et al., 2001). Also included in the in-home sample were supplemental samples based on ethnicity (Cuban, Puerto Rican, and Chinese), genetic relatedness to siblings (twins; full-, half-, and unrelated siblings from the same household), adoption status, and disability. In addition, black adolescents with at least one college-educated parents were oversampled.

Over twenty thousand (20,745) students completed 90-minute **Wave 1** in-home surveys, yielding a 76% response rate. Over 80% of the participating adolescents' resident

parents (usually the mother) completed the parent questionnaire for a total parent sample of 17,670. Figure 2.2 illustrates the Add Health study design (source: Harris, 2011).

Respondents from Wave 1 subsequently have been reinterviewed up to three times spanning a period of 15 years. *Wave 2* interviews were conducted in 1996. People who were in the 12th grade at Wave 1 and who were not a part of the genetic sample at Wave 1 were excluded from interviews.

Wave 3 data collection took place in 2001-2002 and included all of the original respondents from the Wave 1 sample. There were 15,197 completed interviews at Wave 3, resulting in a 77.4% response rate among those who were interviewed at Wave 1. At Wave 3, a total of 1,507 romantic partners (married, cohabitating and dating) of respondents were recruited into the study. Respondents were between 18-26 at this time.

Wave 4 interviews were conducted in 2007-8 when the cohort was 24-32 years of age (Harris, 2011). A total of 15,701 respondents from Wave 1 participated in the Wave 4 interviews (response rate of 80.3% of those interviewed at Wave 1).

2.1.2 Data Collection

The Wave 1 and Wave 2 in-home interviews were conducted on laptop computers using audio-CASI technology (audio-computer assisted self-administered interview) for sensitive health status and health-risk behavior questions. Waves 3 and 4 survey data were collected using a 90-minute CASI/CAPI (computer assisted personal interview) instrument. Respondents entered his/her own responses to questions for sensitive material (CASI)—such as sexual

behaviors, romantic relationships, and pregnancies—whereas interviewers read questions and entered the answers for less sensitive topics (CAPI).

2.2 KEY VARIABLES

This section describes the measures used to operationalized the constructs in the conceptual model (See Figure 1.1 Page 30). It first details the dependent variable, violent behaviors, and the primary independent variables, social relationships with parents, friends, and romantic partners. Then other risk factors for violence are described along with demographic control variables included in this study.

2.2.1 Dependent Variable

Violence trajectories were created from Waves 1, 2, 3, and 4 reports of violent behaviors. The measure of violence for this study is based on five items that were asked at all waves. The questions/statements asked were whether or not, or how often respondent was: involved in a serious physical fight, involved in a group fight, used/threatened use of a weapon, pulled a knife/gun on someone, and shot/stabbed someone. The questions were in reference to behaviors in the past 12 months. The response categories were not consistent across questions and waves, however, and hence responses to all items were dichotomized to 0= never or 1= at least once/yes for each item at each wave. The five items for each wave were then summed to create a count variable of violent acts for that wave with a range from 0 through 5 acts.

2.2.2 Independent Variables: Relationship with Parent(s)

Measures about relationships with parent(s) were created from a series of questions about the quality of the respondents' interactions with their mothers and fathers. The same questions were asked in regards to mothers and fathers. The higher score of the mother or father was designated to represent the person's relationships with his or her parent(s). This technique was used to minimize missing data because many respondents were missing on mother or father and far fewer were missing on both. Thus, from hereon forward, mother and/or father will be referred to as parent. At Waves 1 and 2, the questions were asked about parent or parent figure living in the same household as the adolescent, unless otherwise specified, e.g., closeness to parent. At Wave 3, the questions were asked about the "previous" parent, meaning the parent they mentioned at Wave 1 and "current" parent. Wave 4 questions were asked about parent figures. To include those who did not have a resident parent, and therefore lack a valid score on the scales pertaining to a parent, a conditionally relevant variable was created and used in conjunction with an indicator variable. This conditionally relevant variable was scored as zero for respondents who did not have the relationship. For example, for analyses with relationship with parent, respondents who did not live with a parent at Wave 1 were coded as 0 on the parent measures and an indicator variable was scored 0 = has a resident parent and 1 = does not have a resident parent (Mirowsky, 2013). This coding scheme yields a coefficient for the relationship with parent variable comparable to an analysis restricted to those who have a resident parent, but allows for the inclusion of individuals who do not have a resident parent.

Parental Closeness. Although the Add Health study inquired about parental relationships at each wave, the survey questions were not uniform across waves. Only one item, closeness to parent, was asked in all waves: “How close do you feel to your parent?” The response items are: 1=“not at all” and 5=“very much”. However, which parent these questions referenced varied across the waves. For example, this question was asked about previous resident-, current resident-, and biological-parent at Wave 3, but was asked solely about mother figure in Wave 4. Moreover, in the waves that asked about more than one type of parent, e.g., Wave 3, some people responded to more than one question regarding closeness to parents. To address these multiple responses, a new variable was created for the average closeness to parent figures at each wave. The closeness variable was used to test whether parental relationships have the same effect on violent behaviors at different points in the life course.

Parental Attachment. At Wave 1, it is assessed with a 5-item scale that includes: how much s/he feels the parent cares for her/him; how close the respondent feels to his/her parent; the extent to which respondent perceives parent is warm and loving; respondent’s level of satisfaction regarding communication with parent; and the respondent’s level of satisfaction with the relationship overall. The response codes are on a 5-point Likert scale where 1=“not at all”; 2=“very little”; 3=“somewhat”; 4=“quite a bit”; and 5=“very much”. The responses are averaged across items to provide a score in the scale of the response codes.

Wave 3 measure of attachment includes the following three items: how close the respondent feels to his/her parent, the extent to which the respondent perceives that the parent is warm and loving, and the extent to which the respondent enjoys doing things with the parent. The response items are on the same 5-point Likert scale described for Wave 1. The

items were averaged to provide a score for how attached the person feels to his/her parent in early adulthood that is in the same metric as the response categories.

The *Wave 4* measure of attachment includes the following two items: how close the respondent feels to his/her parent and the level of satisfaction regarding communication with parent. Responses to the two items were averaged to provide the mean score for how attached the person feels to his/her parent in adulthood. Although the number of items varies across waves of data collection, these measures are in the same metric because they are averages.

Child Abuse Victimization was measured for the period of childhood and adolescence (before 18th birthday) and was assessed from retrospective questions about a person's experiences with childhood physical abuse by a parent and/or adult caregiver, hereafter referred to as parent. Questions from Waves 3 and 4 inquired about how often parents hit/kick/threw things at respondent. The response codes are 0="this has never happened"; 1="1 time"; 2="2 times"; 4="3-5 times"; 8="6-10 times"; and 12="more than 10 times". The responses for each question were coded to the midpoint of the interval so that the intervals are equal and the two scores were averaged.

2.2.3 Independent Variables: Relationship with Friends

As with parental relationships, relationships with friends were assessed at each wave, but the measures were not identical. The measures for Wave 1 friends are respondents' perceptions of how much their friends care about them (e.g., *friends care*) and the frequency of contact with friends (e.g., *contact with friends*). Response codes to how much friends care are

on a 5-point Likert scale with 1 = “not at all”; 2= “very little”; 3=“somewhat”; 4= “quite a bit”; and 5= “very much”. Contact with friends asked how many times in the past week the respondent “hung out with friends.” The response codes are 0= “not at all ”; 1= “1-2 times”; 2= “3-4 times”; and 3= “5 or more times”. The early adulthood friend variable at Wave 3 captures the frequency of contact with friends from 0 through 7 or more times in the past 7 days. This includes contact in person and/or by telephone. The adulthood friend variable at Wave 3 is the number of close friends a person reports she or he has in adulthood (e.g., close friends) is defined as people with whom the respondent feels at ease to talk with, can talk to about private matters with, and/or can call on for help. Its response options are from 0 to 7 friends.

The characteristics of friends are as important as the number of friends, but the data do not contain direct measures of the extent to which friends have prosocial or antisocial tendencies. Therefore friends who use illicit substances will be used as a proxy for *delinquent friends*. In Wave 1, adolescents were asked how many best friends (of three) do the following: smoke at least 1 cigarette a day; drink alcohol at least once a month; and use marijuana at least once a month. The three questions were combined to create a delinquent friend(s) variable where 0-3 reflects the minimum number of friend(s) that smoke, drink and/or smoke marijuana regularly. Since drinking is normative in adulthood, the analysis of prosocial/antisocial friends will be limited to illicit substance use at Wave 1. This is an important limitation of the data.

2.2.4 Independent Variables: Romantic Partner Relationships

Romantic partner status during adolescence is measured as the presence or absence of a romantic relationship at Wave 1 and Wave 2. The adolescents were asked, “In the last 18

months have you had a special romantic relationship with any one?" at both waves. The response categories are 0 = "no" and 1= "yes". Early adulthood (Wave 3) and adulthood (Wave 4) relationship status is created from a series of questions about respondent's relationships. Married, cohabitating, and in a relationship, but not living together (hereafter referred to as "other") relationship types are operationalized as three dummy variables with not in a relationship serving as the omitted reference category.

2.2.5 Risk Factors

Drinking regularly was created from a single variable in Waves 1, 3, and 4 that asked how many days in the past month the person had drunk alcohol with responses that range from "never" to "everyday/almost everyday". The response categories of drinking "2-3 days a month" through "everyday" were combined to represent drinking regularly in adolescence coded 1= yes. Drinking less often or never drinking was coded as 0= no. *Smoking regularly* was created from two questions: "have you ever tried cigarette smoking" and its subsequent question asked to people who responded yes, "have you ever smoked cigarettes regularly, that is, at least 1 cigarette every day for 30 days?" Both questions responses were 0= no and 1= yes. Those who never tried smoking were coded as 0 for smoking regularly at each Wave. Those who reported they had tried smoking in the first question were asked the subsequent question. They were coded for 0 for smoking regularly if they reported they did not smoke at least 1 cigarette every day and 1 if they reported they had smoked at least 1 cigarette every day.

Violence victimization variables in Wave 1 was created from the following five questions: During the past 12 months how often each of the following things happen: "someone pulled a knife/gun on you", "someone shot you", "someone stabbed you", "you saw

someone shoot/stab another person”, and “you were jumped”. The variables were summed to create a count and then dichotomized because the distribution was highly skewed at 0. As a result, 0= Never and 1= At least once. Most of the questions for Wave 3 and Wave 4 violence victimization are similar as Wave 1, but two are different. The following five questions used to create violence victimization in these waves: during the past 12 months how often each of the following things happen: “someone pulled a knife/gun on you”, “someone shot or stabbed you”, “you saw someone shoot/stab another person”, and “you were beat up”, and “someone slapped, hit, choked, or kicked you”. Violence victimization is coded 1 at Wave 3 specifically for a person who had the first incidence of victimization in the last 12 months and is coded as 0 for Wave 3 incident of violence victimization irrespective of whether they experienced violence in previous interviews. Likewise, Wave 4 violence victimization is coded 1 for a person who had the first incidence of victimization act was committed against him/her for the *first time* in adulthood. That is if a person who had reported violence victimization in Wave 1, and therefore coded 1 for Wave 1 violence victimization, and reported that at least one of the five violent behaviors happened to him/her in Wave 3, this person was coded as 0 for Wave 3 violence victimization. Similarly, Wave 4 violence victimization is coded 1 for a person who experienced one or more acts of violence against him/her for the first time, that is had never reported an occurrence at Waves 1 or 3. All other respondents are coded as 0= no.

Risk-taking was assessed in Waves 3 and 4 by asking respondents to respond on a Likert scale that ranged from 1= Strongly Disagree to 5= Strongly Agree to the following statement: I like to take risks. This variable was created to assess the degree to which a person enjoys

taking risks in early adulthood and adulthood to see if it is related to violent activity in those developmental stages.

2.2.6 Demographic Characteristics

The following demographic variables have been created for this study: gender, age, race/ethnicity, family structure, household income, and parental education. Gender was created from Wave 1 data with female coded as 0 and male coded as 1. Age was calculated using the date of birth and date of interview to obtain age at each interview. Family structure was created from a constructed family structure variable provided by Add Health. The constructed variable was created from Wave 1 questions that asked about respondents' relationships to all people in their households. The family structure variable for this study was created from a 5-category constructed variable by combining single mother and single father to create one category representing a single mother or single father household. Family structure is therefore operationalized as three dummy variables with two biological/adoptive parents as the omitted reference group: biological parent and one non-biological parent/stepparents/any two non-biological parents; single mother or single father; and other. For ease of presentation, these variables are referred hereafter as "two parents", "parent and step-parent", "single mother or single father", and "other". Race/Ethnicity was based on Wave 1 interviews and is operationalized by three dummy variables with Non-Hispanic White as the omitted reference category: Hispanic/Latino; non-Hispanic Black; non-Hispanic Asian/Pacific Islander; and 4= American Indian/Native America/other, hereafter referred to as "other". Household income was created from Wave 1 parent interviews and is operationalized as three variables with

“more than \$50,000” as the omitted reference group: “less than or equal to \$25,000”; “more than \$25,000 and less than or equal to \$50,000”; and “missing income”. Parent’s education level was created from designating the highest education level between the mother and father on the questions, “How far did your mother/father go in school?” Parental education is operationalized as five dummy variables with “high school degree/GED” as the reference group: “less than high school”; “some college/technical school”; “college graduate”; “graduate/professional school”; and “missing education”.

2.3 ANALYTIC SAMPLE

2.3.1 Derivation

Figure 2.3 presents how the analytic sample was derived from the full Wave 1 in-home sample of adolescents (n=20,745). As described in a previous section about the Add Health study sample, the Wave 1 in-home sample draws from the school sample (n= 90,118, see Figure 2.2.). Unequal selection probabilities necessitate the use of sample weights to make adjustments so that parameter estimates are not biased. As such, this study is limited to those with valid sample weights so that results are generalizable to the adolescents attending schools in the United States 1994-5 as subsequently modified by attrition. Respondents who had missing sample weights, n=5,945, were dropped because they were ineligible for the study. This group includes individuals who are a part of the genetic sample for whom sampling weights could not be constructed since they were selected outside of the sampling frame. Eligibility for the study required respondents present at Waves 1, 3, and 4 or all four waves, thus 2,512 more people were ineligible because they were not interviewed at the Wave 3. Of

the 12,288 people who were eligible people for this study, 2,866 were interviewed at Waves 1,3, and 4, and 9,422 who were interviewed at all four waves.

There were several other deletions as well, as shown in Figure 2.3. Valid dependent variable measures from Waves 1 and 4 were necessary to better inform the trajectory analyses; hence of the 12,288 eligible people, 136 were removed for missing violence data at Wave 1 and/or Wave 4. Additionally, five respondents who were 11 years old at Wave 1 were also excluded because there are too few to analyze to provide good estimates and they are likely to be atypical of the population of 11 year olds. Finally, 950 who people were missing on at least one of the independent variables for this study were not included in the analytic sample.

2.3.2 Attrition and Analytic Drops

To examine the impact of attrition over time and the analytic drops, the proportion of the Wave 1 in-home sample that was retained in the analytic sample versus those who were lost to follow up was compared across Wave 1 characteristics using Chi-square tests of group differences. Table 2.1 provides the results of these analyses and shows that the differences based on these characteristics are statistically significant. The subgroups were based on key demographic characteristics and violence counts in Wave 1 to determine the potential impact on study generalizability due to lost to follow-up and study exclusions from not meeting study criteria.

As can be seen, nearly 60% of females from Wave 1 were retained in this study, whereas only half of males were retained. More ethnic/racial minorities were lost to follow up than Non-Hispanic Whites. Nearly 60% of Whites from the Wave 1 sample are in the analytic sample

compared to about 50% of the racial/ethnic minority groups. A larger percentage of people with two biological parents are in the analytic sample than those with other family structure categories. Only 37% of people from “other” family structure in adolescence remained in the analytic sample. A greater proportion of people whose parents attained higher levels of education are in the analytic sample than those with lower levels of education. The same pattern is found with household income.

Wave 1 violence counts were also statistically significantly different between people who are in the analytic sample versus those who are not, indicating potential bias due to attrition and analytic drops. Specifically, the percentages of people who were lost to follow up are larger for people with higher counts of violence at Wave 1.

Of note, the results in Table 2.1 are with unweighted data because this analysis compares who those who are in the sample and who have been lost to follow up. The sample weights used in the study will decrease the potential bias due to lost to follow up since the weights adjust for sample attrition between Waves 1 and 4. They also adjust for unequal selection probabilities at Wave 1.

2.3.3 Sample Characteristics

Table 2.2 provides a summary of the demographic characteristics of the analytic sample (n=11,197). Females comprise a slightly larger proportion of the analytic sample than males by 2%. The largest racial/ethnic group is Non-Hispanic White. Racial/ethnic minorities are about 30% of the sample, half of whom self-identify as Black. The majority of people in the analytic sample come from two-parent families. Close to a quarter of the sample lived with a single

mother or single father in adolescence. The remaining 20% of the sample are from parent and stepparent or “other” family structures. About one third of the sample have parents whose highest level of education is completing high school, the largest category of parental education. About 11% of respondent’s parents have less than a high school education, whereas more than 40% of the sample’s parents have received post-secondary education. The middle household income category comprises the largest proportion of people in the sample. The lowest income category and the highest income category are both 25% of the analytic sample. An additional fifth of the sample was missing on household income.

2.4 ANALYTIC PLAN

This section details the analytic plan used to attain the specific aims of this study. In preparation for this analysis, data files from Add Health Waves 1, 2, 3 and 4 in-home interviews and information about the sample design (e.g., weights) were merged according to each respondent’s unique identifier. Analyses were conducted with STATA version 12.0 and a user supplied program available as a STATA plug-in, *traj* (Jones & Nagin, 2012) that estimates group based trajectory models. The multinomial logistic regression procedure was used in several of the analyses. The *svy* commands were used to weight the sample and adjust for design effects.

The focal relationship of this study is between social relationships as independent variables and trajectories of violent behaviors as the dependent variable. Social relationships include those with mothers, fathers, friends, and romantic partners. As described above, the outcome measures of violent behaviors are: carrying a weapon, getting in a serious fight, being involved in a group fight, pulling a knife/gun on someone, and shooting/stabbing someone.

2.4.1 Analysis for Specific Aim 1

To address Specific Aim 1, which is to identify distinct trajectories of violent behaviors from adolescence through young adulthood into adulthood, group based trajectory modeling, also called group based modeling of development (Jones & Nagin, 2012; Nagin & Land, 1993), was used. The user supplied *traj* command STATA plug-in, developed by Jones, Nagin, and colleagues (Jones & Nagin, 2012), was used to estimate these trajectories in order to answer Research Question 1A: How many trajectories and of what type best describe the course of violent behavior over time?

This method is used to analyze longitudinal data in phenomena for which there may be distinct trajectories of change over time followed by groups of individuals as distinct from a single trajectory for the entire population. It is an application of a finite mixture model that identifies clusters of individuals with similar trajectories of violence via a maximum likelihood estimation (Nagin, 2005). This method assumes that the population is composed of a mixture of distinct groups. Moreover, it allows for different shapes in developmental trajectories—linear, quadratic, and cubic. This approach fits censored normal, Poisson, zero-inflated Poisson (ZIP), and binary distributions to longitudinal data, which is important because it accommodates the distributions that violence follows in this study. The ZIP form of this model is used because the longitudinal counts of violence that are being modeled have more zeros than expected with the Poisson distribution. The ZIP model employs two processes: a binary process that produces zeros and a Poisson process that generates counts. The group-based model for the ZIP is given by,

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \beta_3^j \text{Age}_{it}^3 \quad (2.1)$$

where λ_{it}^j is the expected number of acts of violence for person i at time t given membership in group j . Age_{it} is the age of individual i at time t and Age_{it}^2 and Age_{it}^3 is the square and cube of the age of person i at time t , respectively. The β coefficients determine the shape of the trajectories, where the superscript j indicates that the coefficients are not constrained to be the same across the j groups. This is an important aspect of the model because it permits heterogeneity not only in the amount of violent behavior at a given age, but also in the development of violent behavior over time.

Applying this model, the repeated measures of violent behaviors from Waves 1, 2, 3, and 4 were used as the dependent variable with scaled age (i.e., $age/10$) for each wave as the independent variable. Scaled ages are necessary because the complex computer search by which the maximum likelihood parameter estimates are identified improve when successfully higher polynomial terms (e.g., Age , Age^2 , Age^3) are about the same order of magnitude (Nagin, 2005).

Several criteria were used to select the number of groups to include in the model. Nagin (2005) recommends the use of BIC in conjunction with domain knowledge to determine the number of groups because BIC by itself does not always clearly identify an ideal number of groups; in some situations the BIC score increases as more groups as added. Therefore, it is recommended to use a combination of subjective domain knowledge, the objectives of analysis and the goal of model parsimony to determine the number of groups.

Trajectory group membership for respondents is based on probability of group membership and therefore, has some erroneous classification (Nagin & Land, 1993). However,

this procedure makes the assumption that the error in classification is small so that it does not bias parameter estimates or standard errors to a problematic degree. The average posterior probabilities (AvePP) of assigned trajectory group membership were examined to identify potential classification errors for each group. The maximum average posterior probability of assignment to a group is 1.000 with a recommended minimum AvePP of 0.700 for all groups (Nagin, 2005).

Research Q1A pertains to the identification of trajectories for the full analytic sample. Research Q1B pertains to gender differences in these trajectories and the analyses were conducted separately for males and females. The same procedures described above were used to determine the number and types of trajectory groups present for males and females. This procedure does not provide a formal test of whether trajectories differ by gender. Potential issues to consider with the analyses stratified by gender include small group sizes and the decrease in power due to stratification. However, the analytic sample contains large numbers of males and females, which mitigates this concern, and examining gender differences is a considerable advance from many studies in this area that study only males.

To provide a better understanding of the trajectories represented by these groups, Wave 1 demographic variables and group membership were examined. A multinomial logistic regression analysis was conducted to investigate the extent by which these characteristics predict group membership. The dependent variable for the analysis is the four-group categorical variable that the respondents were assigned based on maximum posterior probability in Specific Aim 1. The multinomial model estimates group membership as a function of gender, race/ethnicity, family structure, household income, and parental education.

Multinomial logistic regression compares multiple groups through a series of binary logistic regressions where each group is compared to the same reference group. For example, in this study there are four trajectory groups, thus there are a set of coefficients for the covariates comparing group 1 and group 2, a set of coefficients comparing group 1 and group 3, and a set comparing groups 1 and 4. The multinomial logistic regression model is given by:

$$\ln \left[\frac{P_{ij}}{P_{i0}} \right] = x_i \beta_j \quad (2.2)$$

where P_{ij} is the probability of being in group j , P_{i0} is the probability of being in the reference group, x is a vector of covariates, j represents the groups, and β_j is the coefficient for the comparisons being made. The reference group is when $j = 0$ (Long & Freese, 2006).

The ratio of the probability of being in one group over the probability of being in the reference group is a relative risk ratio which is obtained by exponentiating Equation 2.2 to:

$$\frac{P_{ij}}{P_{i0}} = e^{x_i \beta_j} \quad (2.3)$$

which provides coefficients that are relative risk ratios (RRR) for a 1-unit change in the predictor variable. The RRR estimates are reported in the results of the analyses using multinomial logistic regression models instead of the log odds estimate for ease of interpretation.

2.4.2 Analysis for Specific Aim 2

Specific Aim 2 seeks to elucidate the influence of social relationships on trajectories of violent behaviors from adolescence through early adulthood into adulthood. Multiple logistic

regression and group based modeling techniques were used to address the research questions in Specific Aim 2.

For Research Question 2A, a multinomial logistic regression was conducted to examine the influence of relationships with parents, peer, and romantic partners in adolescence on violence trajectories. The dependent variable for this analysis is the same as in the multinomial logistic regression analysis just described—the categorical variable of the trajectory groups identified in Specific Aim 1. The demographic variables just described in the previous multinomial logistic regression model were included as control variables in this analysis. Adolescent social relationships with parents, friends, and romantic partners are the primary independent variables for this model. The two parent variables from Wave 1 in this analysis are parental attachment and child abuse. The three friend measures from adolescence included are: frequency of contact with friends, the extent that the person perceived friend(s) care for him/her, and the number of friends the respondent has who engaged in what are considered illicit behaviors during adolescence. The presence or absence of romantic partners was the sole romantic partnership variable for this analysis. Risk factors from adolescence included as covariates were: whether a person has been a victim of violence and whether s/he drank or smoked regularly during adolescence.

In addition, a second multinomial logistic regression model was analyzed to consider the extent to which social relationships in early adulthood contribute to why groups that are seemingly on similar paths diverge when people in the groups enter early adulthood, which addresses Research Question 2B. All of the variables from the multinomial regression model just described for Research Question 2A were included in this model with the addition of Wave

3 relationships and risk factors. The Wave 3 social relationships included in the model are parental attachment, romantic relationship status, and the frequency of contact with friends. Risk factor measures from early adulthood are violence victimization, drinking regularly, smoking regularly, and a single item measure on the degree that respondents enjoy taking risks.

Research Question 2C which concerns the impact of social relationships over time, was analyzed in a similar fashion as the analysis for Specific Aim 1, with one important difference, the inclusion of time-varying covariates. Specifically, time-varying covariates were added to the model with the trajectory specifications determined for the full sample (Jones & Nagin, 2007; Nagin, 2005). Two separate time-varying covariate analyses were analyzed: parental closeness from Waves 1 through 4 and the presence or absence of romantic partnerships from Waves 1 through 4. These analyses are limited to these two variables because they are the only social relationship variables that were consistently asked at all four waves. Like in the analysis for the trajectory groups, the dependent variables for these analyses are the counts of violence in Waves 1-4 and the independent variable is age at Waves 1-4.

The group based model including the time-varying covariate of parental closeness is given by an equation of the following type for each trajectory:

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it} \quad (2.4)$$

where Closeness_{it} is the scale measuring each individual's, i , report of parental closeness at Wave t . The α 's are additional trajectory parameters that estimate the effect of closeness on each trajectory. The α 's are superscripted by j 's to denote that each of the parameters is specific to a particular trajectory (Nagin, 2005). As in the previous trajectory analysis, self-

reported violence frequency was modeled using a ZIP distribution with each trajectory defined by the rate of violence, λ_{it}^j , which is obtained by exponentiating Equation 2.4 to the form of:

$$\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}} \quad (2.5)$$

Applying Equations 2.4 and 2.5 and using romantic partnership in lieu of parental closeness as the time-varying covariate results in the following:

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Romantic}_{it} \quad (2.6)$$

where Romantic_{it} is an indicator variable that equals 1 if respondent i is in a relationship in Wave t , and 0 if she/he is not.

According to Nagin (2005, 2007) and Jones (2007), this approach treats the person's trajectory group membership as fixed and information on the violent behavior of group members who do and not have an event are used to infer the impact of the event on the cause of violence in that group. They go on to point out that this approach is consistent with a life course perspective insofar as it corresponds to the idea that trajectories condition the impact of an event, in particular "turning points". Specifically, this approach assesses the impact of the event among persons who have similar developmental trajectories, which helps avoid selection effects. This approach generalizes from an event (yes/no) in this case whether the person is in a romantic relationship, to continuous covariates, that is, to a matter of degree, in this case, the extent of closeness to a parent. In the model without covariates, the trajectories can be interpreted as the "prototypical developmental path of trajectory group members, averaged over all the contingencies that might cause individual variation about this developmental course" (Nagin, 2005, p. 124).

2.4.3 Analysis for Specific Aim 3

To address the research questions for Specific Aim 3, which is to determine how gender influences the impact of social relationships and turning points on violence trajectories, the analyses conducted for Research Questions 2A-C described in the previous section were conducted with the sample stratified by gender. That is, the role of social relationships and violence trajectories were examined separately for males and females.

2.5 SAMPLING WEIGHTS AND COMPLEX SAMPLE DESIGN

The complex sample design for the Add Health Study needs to be taken into account to obtain unbiased parameter estimates and correct variance estimates and standard errors. A cluster variable and post-stratification sample weights are available in the Add Health data that adjust for design effects and unequal probabilities of selection (Chantala & Tabor, 2010). The STATA *svy* procedures were used to adjust for Add Health's complex survey design in the estimation of parameters and robust standard errors for the multinomial regression analyses and descriptive analyses. The STATA *traj* plug-in allows for the use of weights, but not clustering. To compensate for the inflation of tests of statistical significance that results from conducting the analysis as if the data are from a simple random sample, a 0.01 level of statistical significance is used instead of 0.05 for group based trajectory analyses.

2.6 CONCLUSION

This chapter covered several of the methods used to conduct this study. It described in depth the Add Health data and the reasons why it is a good fit for this dissertation, such as its

longitudinal panel design which allowed me to model violence over time and the measures of relationships with parents, peers, and romantic partners at the multiple time points. This chapter also outlined the variables used in this study and the analytic strategies that were employed to address the aims of this study.

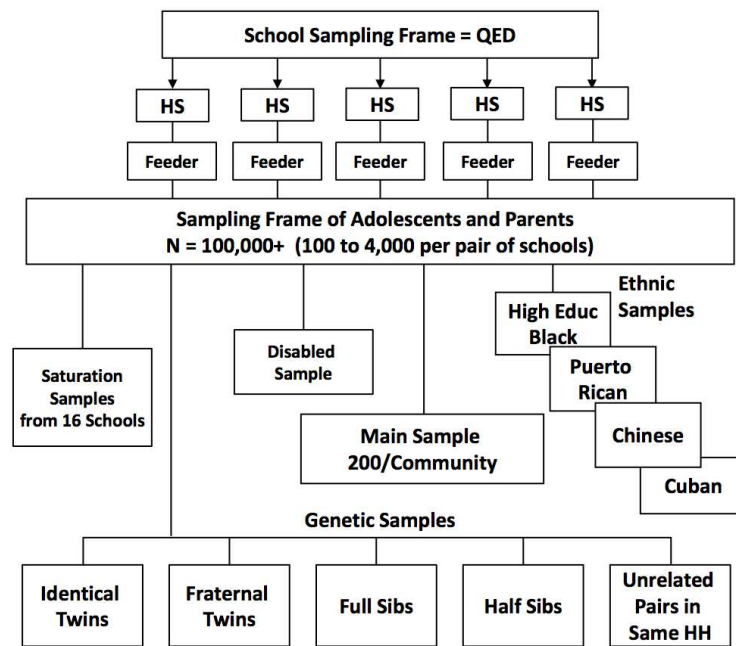


Figure 2.1 Sampling Structure for Add Health (Source: Harris, 2013)

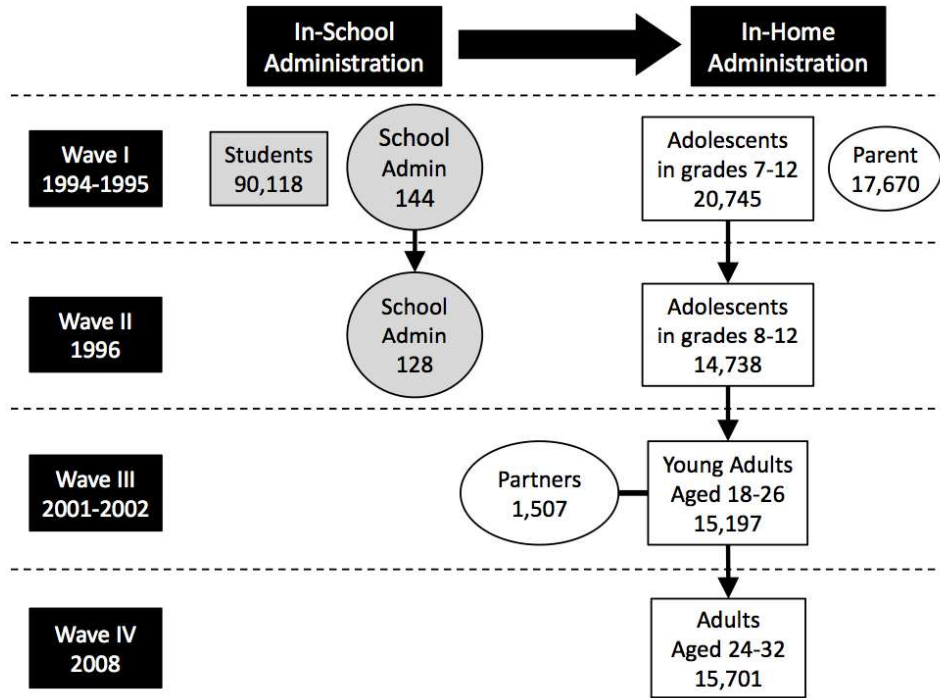


Figure 2.2 Add Health Longitudinal Study Design (Source: Harris, 2013)

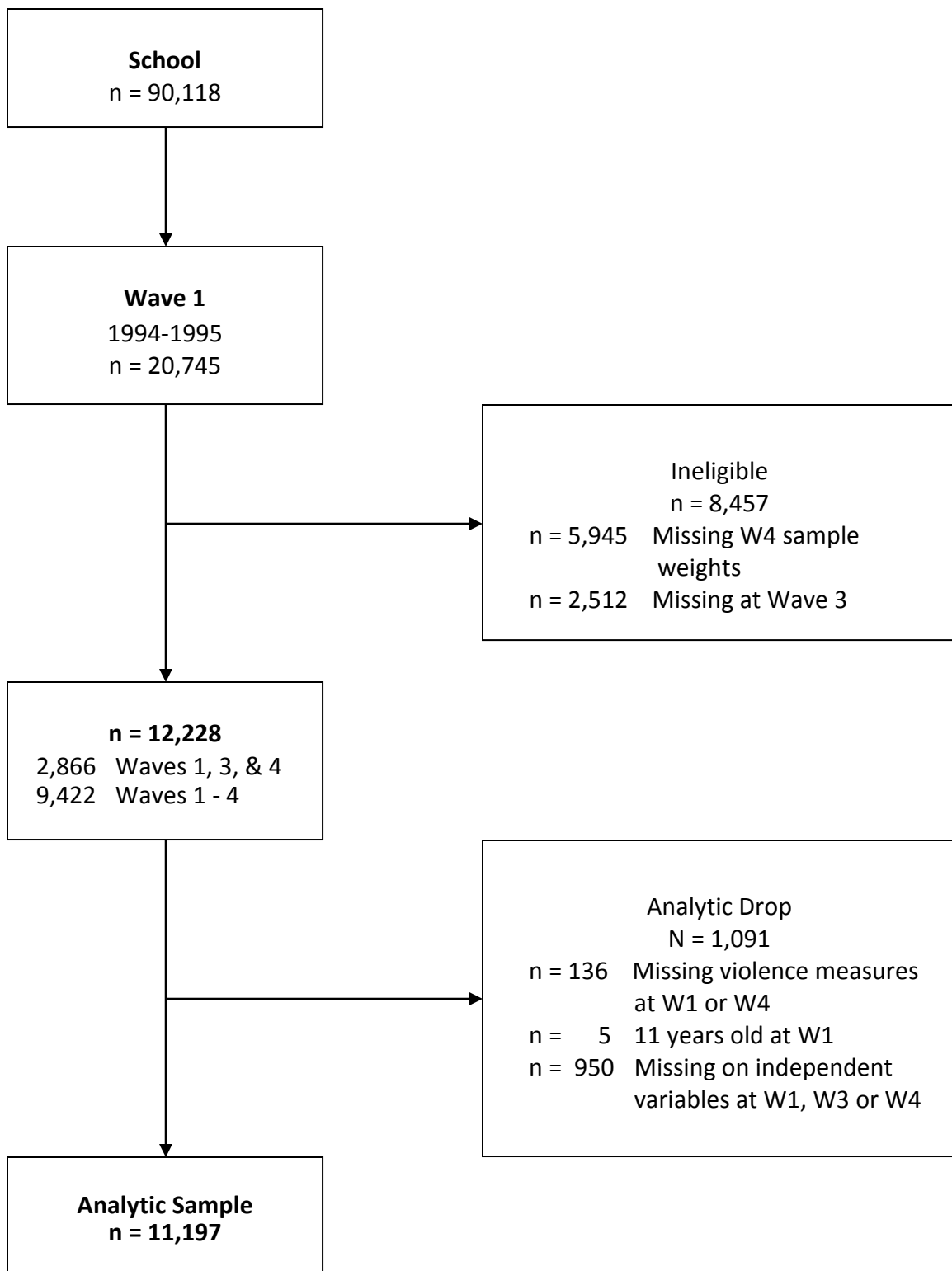


Figure 2.3 Derivation of the Analytic Sample

Table 2.1 Percent Retained in Analytic Sample by Demographic Characteristics and Wave 1 Violence

	W1 Full In-Home Sample (n=20,745)	% Retained in Analytic Sample (n=11,197)
Demographic Characteristics	n	%
<i>Gender</i>		$\chi^2=157.5, df=1, p<.001$
Male	10,265	58.3
Female	10,480	49.6
<i>Race/Ethnicity (W1; n=20,724)</i>		$\chi^2=154.5, df=4, p<.001$
Non-Hispanic White	10,455	58.3
Black/African American	4,767	49.2
Hispanic/Latino	3,310	49.6
Asian American	1,584	51.7
Other	608	49.7
<i>Family Structure</i>		$\chi^2=356.1, df=3, p<.001$
2 Biological Parents	10,339	59.7
Parent and Step-parent	3849	48.8
Single Mother or Father	5,157	51.0
Other	1,400	37.1
<i>Household Income</i>		$\chi^2=219.3, df=3, p<.001$
≤ \$25,000	5,151	50.9
> \$25,000 ≤ \$50,000	5,464	57.7
> \$50,000	4,736	60.4
Income Missing	5,394	47.5
<i>Parental Education</i>		$\chi^2=163.5, df=5, p<.001$
Less than High School	2,455	49.9
High School Degree/GED	5,922	53.2
Some College	4,119	54.7
College Degree	4,524	56.9
Graduate Degree	2,384	60.4
Education Missing	1,341	41.1
Dependent Variables		
<i>W1 Violence (n=20,505)</i>		
0	11,886	56.2
1	5,079	53.9
2	2,539	50.9
3	580	50.9
4	270	45.9
5	151	46.4

Unweighted Data.

Table 2.2 Analytic Sample by Wave 1 Demographic Characteristics (n=11,197)

	Analytic Sample (n=11,197)
Demographic Characteristics	
<i>Gender</i>	
Male	49.0
Female	51.0
<i>Race/Ethnicity</i>	
Non-Hispanic White	67.2
Black/African American	14.8
Hispanic/Latino	11.1
Asian American	3.9
Other	3.0
<i>Family Structure</i>	
2 Biological Parents	57.3
Parent and Step-parent	15.7
Single Mother or Father	22.2
Other	4.8
<i>Household Income</i>	
≤ \$25,000	24.3
> \$25,000 ≤ \$50,000	29.1
> \$50,000	25.9
Income Missing	20.9
<i>Parental Education</i>	
Less than High School	10.6
High School Degree/GED	30.1
Some College	20.2
College Degree	22.5
Graduate Degree	11.2
Education Missing	5.4

Weighted Data.

CHAPTER 3: RESULTS

GROUP BASED TRAJECTORY ANALYSIS

This chapter presents the findings of the group based trajectory analysis for the total analytic sample and by gender to address Specific Aim 1, which is to identify distinct trajectories of violent behaviors from adolescence through young adulthood into adulthood. The process by which the trajectory groups were determined, the shapes of the groups, and their distributions in the full and gender-stratified subsamples is detailed in this chapter. This chapter also describes how Wave 1 demographic characteristics distinguish group membership.

3.1 TRAJECTORY GROUP ANALYSIS AND IDENTIFICATION

The group based trajectory approach was used to identify the number of distinct groups in the total analytic sample ($n=11,197$) and then separately for females ($n=6,107$) and males ($n=5,090$). The dependent variable for the analysis is made up of the repeated measures of violence counts from Waves 1 through 4. The independent variable is age (i.e., scaled to $\text{age}/10$) at each wave. Scaled ages are recommended because the complex computer search by which the maximum likelihood function parameter estimates are identified improves when successfully higher polynomial terms (e.g., age , age^2 , age^3) are about the same order of magnitude (Nagin, 2005). The Zero-Inflated Poisson (ZIP) distribution is used because it accommodates the distribution that violence follows in this sample, specifically a Poisson distribution with violence counts disproportionately clustering at zero.

This analytic technique allows for specifications of varying numbers of groups and groups of different shapes over time. Therefore, several combinations of groups and shapes

were tested to determine the optimal model to describe the data. The best criteria used to establish the correct number of model components remains an unsettled issue: although the maximum Bayesian Information Criteria (BIC; least negative value) is a widely recommended standard, it does not always identify an optimal number of groups (Nagin, 2005). As such, model identification must factor domain knowledge and research objectives, and maintain features of the data that are theoretically and empirically sound—all while achieving model parsimony. The criteria for model selection and performance used to determine the best fit models for this study include: (1) BIC, (2) Average Posterior Probability (AvePP) of assignment for each group, (3) estimated group probabilities versus the proportion of the sample assigned to the group, and (4) odds of correct classification (OCC). Together these diagnostics are used to ensure that the chosen models correspond well with the data. This process was implemented first for the full sample and then separately for females and males.

3.2 FULL SAMPLE: TRAJECTORY GROUP DERIVATION

Based on Nagin's and Jones' recommendations for model selection just described, the analysis started with a 3-group model with each group set to a quadratic order (Jones, Nagin, & Roeder, 2001; Nagin, 2005). Three groups were selected as a starting place based on a meta-analysis of prior research on delinquent behaviors (e.g., vandalism, hitchhiking, running away from home, etc.) that used this technique and found an average of 3-5 groups best represent trajectories of delinquent behaviors over time (Piquero, 2008). Although violence and delinquency are not interchangeable, they do overlap considerably, thus this is a useful starting place. Additional models (i.e., 4-, 5-, and 6-group models) were tested until the BIC score

reached a maximum before it then decreased with each additional group. Although the 6-group model with a quadratic term for all the groups yielded the best BIC score (BIC=-56,882.87), it did not appear to fit the data well across the other model fit standards. Several 6-group models with different ordered terms were tested, but most of the parameter estimates were not significant and the AvePPs for almost all the groups were less than the recommended minimum of 0.70. Consequently, several 5-group models were then tested since the 5-group model had the second highest BIC score (-57,087.14). However, like the 6-group model, many parameter estimates were not statistically significant and the AvePPs for some of the groups were low. Since the 4-group model with all quadratic terms had the third highest BIC score (-57,129.64), various 4-group models were estimated. After examining the diagnostic criteria for model accuracy identified above, it was determined that a 4-group model was optimal to represent the trajectories of violence from adolescence to adulthood for the overall sample.

The four groups for the full sample are described by the parameter estimates in Table 3.1 that fit an equation of the form:

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2 + \beta_3^j Age_{it}^3 \quad (3.1)$$

Where λ_{it}^j is the expected number of acts of violence for person i at time t given membership in group j . Age_{it} is the age of individual i at time t , Age_{it}^2 is the square of the age of person i at time t , and Age_{it}^3 is the cube of the age of person i at time t . The model's coefficients (i.e., $\beta_0^j, \beta_1^j, \beta_2^j$, and β_3^j) determine the shape of the trajectories, where the superscript j indicates that the coefficients are not constrained to be the same across the j groups. This is an important aspect of the model because it permits heterogeneity not only in the amount of

violent behavior at a given age, but also in the development of violent behavior over time (Jones & Nagin, 2007; Nagin, 2005).

To calculate the expected number of violent counts, λ_{it}^j , for person i at time t , equation 3.1 is exponentiated to:

$$\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \beta_3^j \text{Age}_{it}^3} \quad (3.2)$$

These counts are then plotted for each trajectory group in Figure 3.1. For example the group labeled *low desister* in Table 3.1 is defined by an intercept (β_0) and a linear term (β_1) for age which results in the following equation for this group: $\ln(\lambda_{it}) = 3.596 - 3.467 * \text{Age}_{it}$. To obtain the expected number of violent counts for person i at time t in the *low desister* group, the equation is: $\lambda_{it} = e^{3.596 - 3.467 * \text{Age}_{it}}$. The plot of this trajectory in Figure 3.1 shows a low level of violence at baseline, 0.570 of a possible range of 0 to 5 counts per year, which then declines steadily over time. Therefore, this group is labeled *low desister*.

Table 3.1 is ordered from top to bottom by largest to smallest group and includes the model accuracy values for each group and the distribution of the four groups. The *low desister* group just discussed is the largest trajectory. Although this group has an OCC less than 5.0, which is less than ideal, the AvePP is over 0.8 for this group, which is considered very good (Chung et al., 2002; Nagin, 2005). For the second largest group, the predicted number of violent acts is defined by an intercept, a linear term for age, and a quadratic term for age. It starts with average violence levels above 1 per year that increase during adolescence before declining; this group is therefore called *high desister*. The AvePP and OCC values are of a magnitude that is considered good as shown in Table 3.1. An intercept term only defines the

next largest group. This group, *chronic perpetrator*, maintains relatively high average levels of violence from adolescence to adulthood. It has excellent model accuracy scores with AvePP and OCC values that exceed the recommended minimums. Finally, as shown in Figure 3.1, the smallest group begins with very low levels of violent activity that increase as the person approaches adulthood. At this point, violent activity escalates considerably; hence this group is termed *late escalator*. In its logarithmic form, this group is defined by an intercept and a linear term for age. The AvePP and OCC of this group are 0.839 and 40.103, respectively, which are very good. When reviewing how the four groups meet the two model fit criteria used here, this 4-group model has considerable precision. The other criterion is described next.

The percentage distributions of the groups in the population and in the sample are also displayed in Table 3.1. The *low desister* group constitutes about half of the population while the *high desister* group is about a quarter of the population. The other two groups together form the remaining quarter and are roughly the same size. These percentages are based on the statistical model for the population and yield the expected distribution of the groups in the population, taking into account the uncertainty of group membership (Nagin, 2005).

In contrast, the distribution of these trajectories in the sample, shown in the next column of Table 3.1, is based on calculating the probability of membership in each group for each specific respondent and then assigning the respondent to a group based on his or her highest probability of group membership. The *low desister* group constitutes more than half of the sample while the *high desister* group constitutes slightly more than one fifth of the sample. The other two groups, that is the *chronic perpetrator* and *late escalator* groups, together form the remaining 20% of the sample.

These two sets of percentages should be similar, but they are not expected to be identical because one applies to the population and the other to the specific participants in this study (Jones, B., personal communication, September 13, 2013). The probability of group membership for the population takes into account uncertainty of group membership and is the mean of the group assignment probabilities. It is the probability that a random individual follows a group's trajectory (Nagin, 2005). Percentages reported in reference to the sample, as just mentioned, represent the proportions based on assignment to a group that best conforms to an individual's observed behavior according to the maximum posterior probability of group membership (Chung et al., 2002; Nagin, 2005). These assignments by their very nature contain some measurement error, i.e., misclassification, because they are based on probabilities and are not certain. Currently, there lacks a test to assess probabilistically what is considered too large of a discrepancy between the group proportions in the sample and in the population (Jones & Nagin, 2012). All categorical variables are operationalized as dummy variables.

3.3 WAVE 1 DEMOGRAPHIC CHARACTERISTICS AND VIOLENCE TRAJECTORIES

A multinomial logistic regression with baseline demographic characteristics as the independent variables was analyzed to establish how these time stable characteristics distinguish group membership. The categorical dependent variable represents the four trajectories just described. The *low desister* group is the omitted reference group. The sociodemographic variables are gender, race/ethnicity, family structure, household income, and parental education level scored for the highest education attained by either parent. The

categories for race/ethnicity are Black/African American, Hispanic/Latino, Asian American, American Indian/Other, and Non-Hispanic White, which is the omitted reference group. Family structure categories are: “stepparents”, “single mother or single father”, “other”, and the reference category is composed of households with of two parents. There are four income categories where “missing”, “less than or equal to \$25,000”, “more than \$25,000 and less than or equal to \$50,000”, and the reference category is the highest income bracket of “more than \$50,000”. Parental education reflects the highest education that respondent’s mother and/or father received. This variable has the following categories: “missing”, “less than high school”, “some college/tech school”, “college graduate”, “graduate/professional school”, “missing”, “high school degree” as the reference group.

3.3.1 Membership in the High Desister Group Relative to the Low Desister Group

All of the demographic characteristics are statistically significant predictors of group membership in this comparative analysis. The effect of gender is very large: males have 2.7 times the risk of females of being in the *high desister* than *low desister* group. Compared to non-Hispanic Whites, people who self-identify as Black, Hispanic, or “other” have an increased risk of membership in the *high desister* than *low desister* group. The effect of race/ethnicity is moderate. People from households without two parents have an increased risk of being in the *high* than *low desister* group compared to people from two biological parent households. The lowest income group differs from the highest income group, but the other income levels are not significant. Compared to people whose parents have completed high school, people whose

parents have attained education levels beyond that are less likely to be in the *high* than the *low desister* group.

3.3.2 Membership in the Chronic Perpetrator Group Relative to the Low Desister Group

As in the above comparison, all of the demographic characteristics are significantly linked to membership in the *chronic perpetrator* group relative to the *low desister* group. The effect of gender in particular is very large. Males are over four times more likely than females to be in the *chronic perpetrator* group than the *low desister* group. Compared to Whites, racial/ethnic minority groups, with the exception of Asian Americans, have moderately increased risks of being in the *chronic perpetrator* than the *low desister* group. As found in the above comparison, socioeconomic status is inversely associated with group membership: people from households with the lowest income in comparison to people from households with the highest income are more likely to be in the group that continues to perpetrate violence versus the group that desists. Additionally, people whose parents have a college degree compared to people whose parent have a high school degree are less likely to be in the *chronic perpetrator* group than the *low desister* group.

3.3.3. Membership in the Late Escalator Group Relative to Low Desister Group

The only demographic characteristic that differentiates group membership in these two groups is race/ethnicity. Specifically, the risk of being in the *late escalator* group as opposed to the *low desister* group is increased for people who self-identify as Black in comparison to people who self-identify as Non-Hispanic White by a factor of 1.490.

3.3.4 Membership in the Chronic Perpetrator Group Relative to the High Desister Group

In the analysis just described, the risk of being in each trajectory group relative to being in the *low desister* group was evaluated. Many of the same demographics are statistically significant in differentiating membership between the *low desister* versus *high desister* groups and the *low desister* versus *chronic perpetrator* groups. Additionally, as can be seen in Figure 3.1, both of these groups have relatively high levels of violence during adolescence and have similar paths before they paths diverge in early adulthood—one desists from violence and the other continues to perpetrate. Therefore the multinomial logistic regression model was re-estimated with the *high desister* group as the reference to identify demographic characteristics that differentiate these two groups. Only the coefficients for the risk of being in the *chronic perpetrator* group relative to the *high desister* group are presented and interpreted in Table 3.3 because this is the targeted comparison. As can be seen, all the demographic characteristics except for income are statistically significant in this model. Males have a greater probability compared to females of being in the *chronic perpetrator* group than the *high desister* group. Relative to people from households with two biological parents, people from households with a parent and step-parent have a small increased risk of being in the *chronic perpetrator* group than the *high desister* group. People missing on parental education also have an increased risk of being in the group that persists versus desists in the enactment of violence through adulthood.

3.4 FEMALES: TRAJECTORY GROUP DERIVATION

The same process was used to determine the optimal model for the female subsample (n=6,107) as was used for the total sample. That is, the search started with a 3-group model with each group set to follow a quadratic order and then models with additional groups were tested until the BIC score peaked. Like in the full model, despite having the highest BIC score, the 6-group model did not suit the data well based on model fit standards (i.e., statistical significance of the parameter estimates, population vs. sample proportion, AvePP, and OCC) even with different combinations of ordered terms. Several 5-group models were also tested and although the parameter estimates were significant, the AvePP for almost all the groups were less than the recommended minimum of 0.70 and other model fit indicators were also poor. After various 4-group combinations were analyzed, a 4-group model was determined to be the best model to represent female trajectories of violence from adolescence to adulthood based on these multiple criteria.

The 4-groups model that best depicts female violence over time yields the parameter estimates presented in Table 3.4 and are linked to age by the form of Equation 3.1 defined in the previous section (Section 3.2; Page 61). Table 3.4 also provides the model fit solutions and the population and sample distributions of these four groups. The largest group, *low desister*, is defined by an intercept and a linear term for age. As described previously, in order to obtain the expected counts of violence for each group, the equation for the group is exponentiated to the form of Equation 3.2 (Section 3.2; Page 62).

As shown in Figure 3.2, the *low desister* group starts with low levels of violence, 0.465 of a possible range of 0 to 5 counts per year, decreases rapidly, and reaches 0 violence counts by

age 20. Thus, this group is called *low desister*. Although the OCC is less than ideal, its AvePP is very good. The second largest group is defined by an intercept term, a linear term for age, and a quadratic term for age-squared. This group starts with higher levels of violence than the *low desister* group. As seen in Figure 3.2, the *high desister* group increases and peaks when the females are age 14 with 1.297 counts of violence per year before declining in late adolescence. This group desists from its violent activities when these females are about 22 years old. This group is labeled *high desisters*. It has good model fit solutions with an AvePP and an OCC above the recommended minimums. The third group, *late escalator*, is described by an intercept and a linear term for age. In contrast to the larger two groups previously described in which the females enact violence at baseline and later desist, females in the *late escalator* group start with near 0 counts of violence and maintain low levels violence in adolescence. The females in this group increase their violent activities as they age with a noticeable acceleration starting in their twenties. The model fit statistics for this group are also very good. The final group, *chronic perpetrator*, enacts relatively high counts of violence at baseline (1.752). This group follows a U-shaped curve such that the females in this group steadily decrease their violent activity during adolescence, stabilize their behaviors between 19-24 years old, and then steadily increase their levels of violence thereafter. It fits Equation 3.1 with an intercept, linear term for age, and a quadratic term for age². This group also has excellent model fit statistics based on their AvePP and OCC values.

The percentage distributions of the groups in the population and sample are also presented in Table 3.4. The *low desister* group comprises more than half of the population. The *high desister* group constitutes one-fifth of the population. The *late escalator* and *chronic*

perpetrator groups combined make up close to a quarter of the population and are about the same size. As shown in Table 3.4, the *low desister* group constitutes close to two-thirds of the female subsample. The *high desister* group comprises close to one-fifth of the females. The *late escalator* and *chronic perpetrator* groups are of similar proportions with less than 10% of the females assigned to each respective group.

3.5 WAVE 1 DEMOGRAPHIC CHARACTERISTICS AND VIOLENCE TRAJECTORIES: FEMALES

A multinomial logistic regression analysis with baseline demographic characteristics was conducted to investigate how time stable features differentiate group membership among females. The categorical dependent variable is the four female violence trajectories just described. The reference group is the *low desister* group because it is the largest and has the lowest level and shortest duration of violent behaviors. The demographic variables considered in this analysis are race/ethnicity, family structure, household income, and parental education. The categories for these variables are the same as the ones just described for the demographic characteristics for the full sample. The reference groups for these characteristics are also the same.

3.5.1 Membership in the High Desister Group Relative to the Low Desister Group: Females

As shown in Table 3.5, all of the demographic characteristics, with the exception of income, significantly distinguish group membership. Compared to Non-Hispanic Whites, racial/ethnic minority females have a moderately increased risk of being in the *high desister* group than the *low desister* group. Females from all of the family structures in reference to

two-biological parent households are more likely to be in the *high desister* group. The magnitude of this effect is strongest among females from “other” family structures. Parental education has an inverse relationship with group membership. Specifically, females whose parents have attained education levels higher than a high school degree have a decreased risk of being in the *high desister* group than the *low desister* group. The magnitude of this effect increases with higher levels of education.

3.5.2 Membership in the Late Escalator Group Relative to the Low Desister Group: Females

The only demographic characteristic that predicts group membership in the *late escalator* group compared to the *low desister* group is family structure. Females from a parent and step-parent households are significantly more likely to be in the *late escalator* group than females from households with two biological parents by a factor of 2.107.

3.5.3 Membership in the Chronic Perpetrator Group Relative to Low Desister Group: Females

As in the above comparison between the *low desister* and *high desister* groups, race/ethnicity, family structure, and parental education significantly differentiate group membership in the *chronic perpetrator* and *low desister* group. Compared to Non-Hispanic White females, Hispanic females have a moderately increased risk of being in the *chronic perpetrator* group than the *low desister* group. However, females who identify as Black are over three times more likely than Non-Hispanic Whites to be in the *chronic perpetrator* group. Females from other family structures have nearly two times the risk of females from two biological parent households of being in the *chronic perpetrator* group than the *low desister* group. As in the previous comparison, parental education has an inverse relationship with

group membership where females whose parents have advanced degrees have a 50% decreased risk of being the group that continuously perpetrates violence versus the one that desists compared to those whose parents have a high school degree.

3.5.4 Membership in the Chronic Perpetrator Group Relative to the High Desister Group: Females

Many of the same predictors that distinguish group membership between the *low desister* and *high desister* groups also differentiate group membership between the *low desister* and *chronic perpetrator* groups. Figure 3.2 shows that during adolescence these two groups' paths are within close range of each other, but diverge around age 18. The females in the *high desister* group cease being violent over time, whereas females in the *chronic perpetrator* continue on a violent path. Thus, the multinomial logistic regression was re-estimated with the *high desister* group as the reference group as described earlier for the full sample. Only the relative risk ratios of being in the *chronic perpetrator* group are reported in Table 3.6 to present the demographic characteristics distinguish these two specific groups. Three of the four demographic characteristics are statistically significant predictors of group membership. Self-identifying as Black versus Non-Hispanic White increases the risk of being in the *chronic perpetrator* group than the *high desister* group by a factor of 1.743. Females who are missing on parental education are 2.443 times more likely to be in the *chronic perpetrator* group females whose parents graduated from high school. Compared to a female from a two-biological parent household, one from a single parent household has a decreased risk of being in the *chronic perpetrator* than the *high desister*. However, the effect is small.

3.6 TRAJECTORY GROUP DERIVATION: MALES

The search for the ideal model for the male subsample (n=5,090) followed the same process as the total sample and females. As in the total sample and the female subsample, the BIC score reached a maximum with a 6-group model (BIC=-33,723.79). Although the 6-group model yielded the highest BIC score, based on the model fit indicators described in the previous sections, it did not correspond well with the data. Similarly, the several combinations of 5-group models that were tested had some non-significant parameter estimates and most of the model fit standards were also below the recommended minimums. Various combinations of 4-group models were tried before confirming that a 4-group model best depicts male violence trajectories from adolescence to adulthood.

The four groups for this best fit model are depicted in Figure 3.3 and defined by the parameter estimates in Table 3.7. Each of the groups fit an equation in the form of Equation 3.1. As described earlier, the equations are exponentiated (i.e., Equation 3.2) to obtain the expected violent counts that are plotted in Figure 3.3. Table 3.7 is ordered from top to bottom from largest to smallest group and includes the OCC and AvePP values of each group.

The largest group is defined by an intercept term and a linear term for age. The path of this group starts with 0.671 counts (of a possible range of 0 to 5) of violence per year at baseline, which declines steadily before it reaches the minimum when the males in this group are about 28 years old. Hence, this group is called *low desister*. It has a very good AvePP, however its OCC is slightly less than ideal. The second largest group is defined by an intercept, linear term for age, and a quadratic term for age². The males in this group enact an average of 1 violent act at age 12 and increase their violent behaviors before desisting, thus this group is

labeled *high desister*. As shown in Table 3.7 this group has good model fit solutions. The third largest group has an intercept term only with males in this group who perpetrate an average count of 1.173 violent acts per year from adolescence into adulthood. This group is, therefore, termed *chronic perpetrator*. The *chronic perpetrator* group has excellent OCC and AvePP values. The smallest group begins with minimal violence activity, increases in its violence levels as the males approach adulthood at which point their violent behaviors escalate considerably. Hence, this group is called *late escalator*. It is defined by an intercept and linear term for age and has excellent model fit values.

Table 3.7 additionally displays the groups' distributions in the male population and male subsample. Based on this model, slightly less than half of the males in the population are estimated to be in the *low desister* group. The *high desister* group is about 25% of the population whereas the *chronic perpetrator* group comprises 20% of the population. The smallest group, *late escalator* constitutes less than 10% of the male population. About half of the male subsample is assigned to be in the *low desister* group. The *high desister* group constitutes a quarter of the male subsample whereas the remaining 20% is comprised of the *chronic perpetrator* and *late escalator* groups.

3.7 WAVE 1 DEMOGRAPHIC CHARACTERISTICS AND VIOLENCE TRAJECTORIES: MALES

A multinomial logistic analysis was conducted to determine the extent to which baseline demographic characteristics distinguish group membership among males, as with the full sample (Section 3.3) and the female subsample (Section 3.5). The four male trajectory groups

just described constitute the categorical dependent variable with the *low desister* group serving as the reference group. The same categorical demographic characteristics and respective reference groups for the characteristics used in previous analyses among females and the total sample are also in this model. The results of this analysis are presented in Table 3.8.

3.7.1 Membership in the High Desister Group Relative to the Low Desister Group: Males

All of the demographic characteristics significantly differentiate group membership in the *high desister* and *low desister* groups among males. Hispanic and “Other” males have an increased risk of membership in the *high desister* group compared to White males. Males from single parent households are more likely to be in the *high desister* group than those from two biological parent households. This effect, however, is small. Socioeconomic status is inversely related to group membership: higher levels of household income and parental education decrease the risk of being in the desisting group with higher rather than lower levels of violence in adolescence. The magnitude of these associations is small.

3.7.2 Membership in the Chronic Perpetrator Group Relative to the Low Desister Group: Males

As in the above comparison, all of the demographic characteristics distinguish group membership in these two groups. Compared to Non-Hispanic Whites, Hispanics and “Others” have an increased risk of being in the *chronic perpetrator* group than the *low desister* group. On the other hand, Asian American males are 46% less likely than White males to be in the *chronic perpetrator* group compared to the *low desister* group. The risk of being in the group that continues to perpetrate violence versus desists is moderately higher among males who are not from two-biological parent households compared to those who are. As found in previous

comparisons, lower levels of household income and parental education levels are positively associated with being in the group that continuously enacts violence rather than the group that desists.

3.7.3 Membership in the Late Escalator Group Relative to the Low Desister Group: Males

Race/ethnicity is the only demographic characteristic that predicts group membership. Black males are 2 times more likely than Non-Hispanic White males to be in the *late escalator* versus the *low desister* group.

3.7.4 Membership in the Chronic Perpetrator Group Relative to the High Desister Group: Males

As was the case for the full sample and the female subsample discussed previously, many of the same predictors differentiate group membership in the *high desister* and the *chronic perpetrator* groups in reference to the *low desister* group among males. This could be because both groups have similar levels of violence at Wave 1 which are higher than the levels of violence enacted by males in the *low desister* group as depicted in Figure 3.3. The *high desister* and *chronic perpetrator* groups significantly diverge at the cusp of early adulthood, with the former group desisting and the latter continuing to perpetrate relatively high levels of violence. To examine how these two groups differ based on Wave 1 demographic characteristics, a multinomial logistic analysis with the *high desister* group as the reference group was performed. Only the results of the comparative analysis between the *high desister* and *chronic perpetrator* groups are presented in Table 3.9. As can be seen, only family structure differentiates membership in these groups. Males from parent and step-parent families have an increased risk of membership in the *chronic perpetrator* group than those from

two-biological parent families. Compared to males from two-biological parent families, those from single parent families are also more likely to be in the *chronic perpetrator* group than the *high desister* group.

3.8 CONCLUSION

Using group based trajectory analysis, four distinct trajectory groups were identified for the total sample and the gender subsamples. Although the names of the four groups are the same for the full sample, females, and males, they differ in terms of their specific equations (based on their parameter coefficients) and compositions. These four groups are: *low desister*, *high desister*, *chronic perpetrator*, and *late escalator* groups. Across the samples, the *low desister* is the largest group, followed by the *high desister* group. The *chronic perpetrator* group is larger than the *late escalator* group in the full sample and male subsample, however it is the opposite in the female subsample. The *chronic perpetrator* group is the smallest among females. In fact, the shape of the *chronic perpetrator* group U-shaped among females whereas it is a constant straight line for a males and the full sample. They are all called *chronic perpetrator* groups, however, because they continuously perpetrate violence.

Overall, demographic characteristics are important in distinguishing the probability of group membership. All of the demographic characteristics differentiate group membership in the *chronic perpetrator* and *high desister* groups in reference to the *low desister* group in the full sample. Gender is a strong predictor for group membership in the full sample. In the male subsample, family structure, income, and parental education differentiate the *high desister* and

chronic perpetrator groups from the *low desister* group. All of the above demographic characteristics with the exception of income distinguish group membership in the *high desister* and *chronic perpetrator* groups compared to *low desister* groups in the female subsample. Race/ethnicity is the only statistically significant demographic characteristic that increases the risk of membership in the *late escalator* group compared to the *low desister* group for the full sample and male subsample, specifically Blacks are more likely than Non-Hispanic Whites to be in the group that escalates versus desists. Only family structure is statistically significant in this comparison for females.

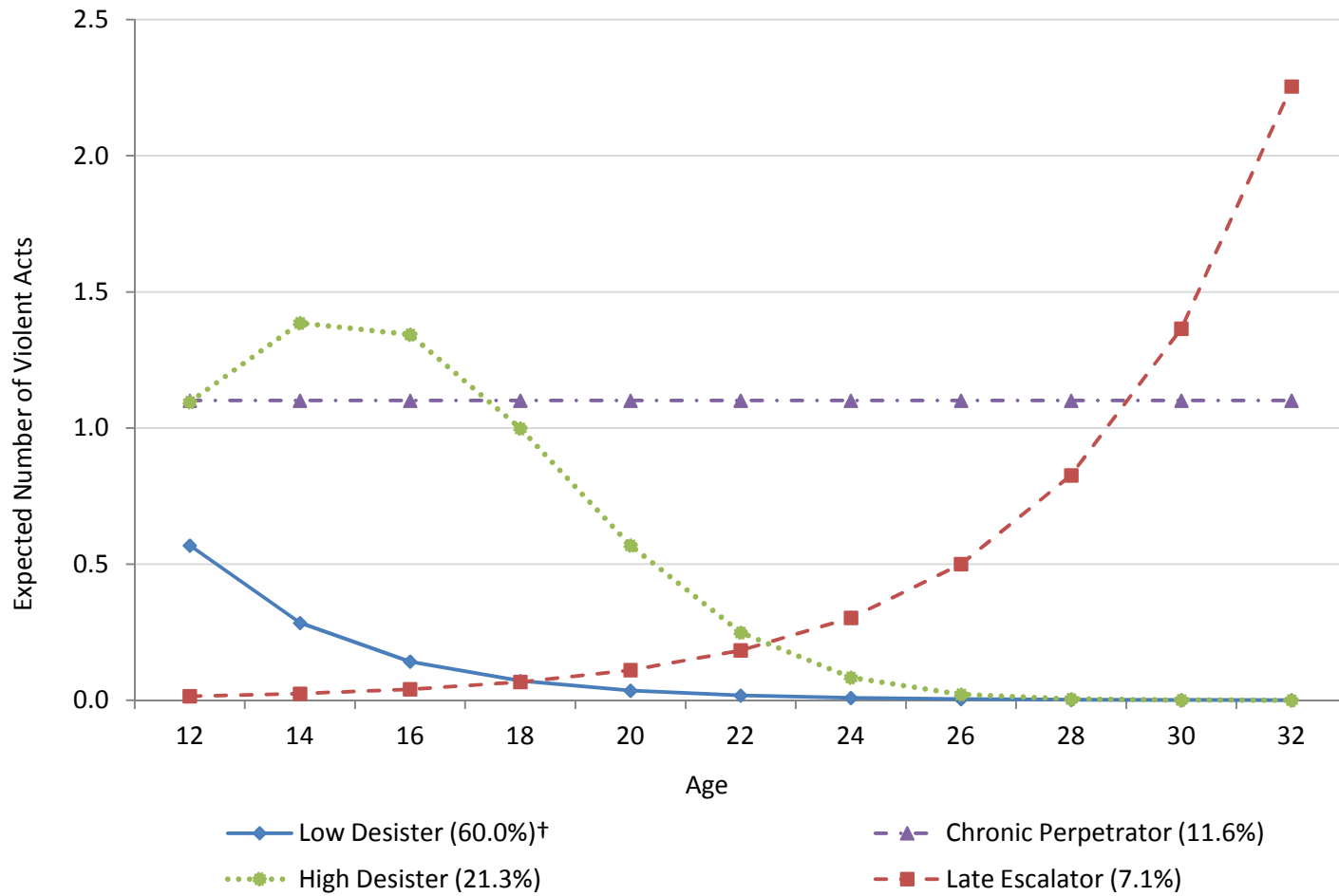


Figure 3.1. Violent Acts by Age for Four Trajectories of Violent Behaviors, Full Sample (n=11,197)

† Sample Percentages

Table 3.1 Parameter Estimates (Standard Errors), Model Selection Criteria, and Percent Distribution of Trajectories for 4-Group Model (n=11,197)

<i>Groups</i>	Parameter Estimates ^a			Model Selection Criteria		Percent Distribution	
	β_0	β_1	β_2	AvePP	OCC	Population	Sample
Low Desister	3.596 ^{***} (0.332)	-3.467 ^{***} (0.237)	b	.810	3.967	51.8	60.0
High Desister	-6.896 ^{***} (1.034)	9.808 ^{***} (1.249)	-3.321 ^{***} (0.372)	.736	9.603	22.5	21.3
Chronic Perpetrator	0.096 ^{***} (0.040)	b	b	.839	38.386	14.2	11.6
Late Escalator	-7.217 ^{***} (0.807)	2.509 ^{***} (0.276)	b	.864	40.103	11.5	7.1

Weighted data.
BIC= -57207.57.

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j Age_{it} + Age_{it}^2 + Age_{it}^3$ where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j Age_{it} + Age_{it}^2 + Age_{it}^3}$.

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

Table 3.2 Relative Risk Ratios (RRR) for Group Membership by Wave 1 Demographic Control Variables (n=11,197)

<i>Demographic Characteristics^b</i>	High Desister^a (n=2,360)			Chronic Perpetrator^a (n=1,282)			Late Escalator^a (n=843)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
Gender	2.691 ^{***}	2.328	3.111	4.057 ^{***}	3.396	4.837	1.194	0.981	1.454
Race/Ethnicity									
Black/African American	1.593 ^{***}	1.283	1.977	1.828 ^{***}	1.387	3.409	1.490 [*]	1.122	1.980
Hispanic/Latino	1.639 ^{***}	1.280	2.099	1.455 ^{**}	1.134	2.867	1.031	0.730	1.456
Other	1.503 [*]	1.091	2.070	1.902 [*]	1.119	4.234	0.820	0.434	1.548
Asian American	1.074	0.777	1.484	0.673	0.429	1.057	1.098	0.792	1.521
Family Structure									
Parent and Step-parent	1.168	0.972	1.403	1.546 ^{***}	1.267	1.888	1.308	0.992	1.724
Single Mother or Single Father	1.311 ^{**}	1.124	1.528	1.538 ^{***}	1.222	1.928	1.127	0.889	1.429
Other	1.481 [*]	1.008	2.177	1.874 ^{**}	1.203	2.919	1.364	0.815	2.283
Household Income									
≤ \$25,000	1.488 ^{**}	1.150	1.927	1.661 ^{**}	1.250	2.207	1.335	0.989	1.802
> \$25,000 ≤ \$50,000	1.180	0.955	1.459	1.222	0.953	1.566	1.055	0.812	1.371
Income Missing	1.256	0.950	1.660	1.261	0.939	1.693	1.309	0.975	1.757
Parental Education									
Less than High School	0.957	0.756	1.212	1.021	0.734	1.421	0.849	0.600	1.203
Some College	0.731 ^{**}	0.615	0.870	0.934	0.725	1.202	0.868	0.657	1.147
College Degree	0.638 ^{***}	0.532	0.765	0.754 [*]	0.591	0.963	0.811	0.621	1.059
Graduate Degree	0.554 ^{***}	0.425	0.722	0.650	0.476	0.888	1.065	0.803	1.414
Education Missing	0.766	0.549	1.068	1.487	0.965	2.293	0.657	0.402	1.073

Weighted data.

F (48, 81) = 12.76, p<.001.

a. Reference trajectory group is *low desister*.

b. Demographic characteristics reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, household income=>\$50,000, parental education (highest)=high school diploma.

*** p<.001 ** p<.01 * p<.05.

Table 3.3 Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 Demographic Control Variables (n=3,642)

<i>Demographic Characteristics^b</i>	Chronic Perpetrator^a (n=1,282)		
	<i>RRR</i>	<i>95% CI</i>	
Gender	1.508 ^{***}	1.216	1.870
Race/Ethnicity			
Black/African American	1.148	0.877	1.502
Hispanic/Latino	0.888	0.641	1.229
Other	1.265	0.688	2.327
Asian American	0.627	0.387	1.016
Family Structure			
Parent and Step-parent	1.324 [*]	1.045	1.677
Single Mother or Single Father	1.171	0.935	1.466
Other Family Structure	1.265	0.800	2.000
Household Income			
≤ \$25,000	1.116	0.804	1.548
> \$25,000 ≤ \$50,000	1.035	0.768	1.396
Income Missing	1.004	0.721	1.398
Parental Education			
Less than High School	1.067	0.772	1.473
Some College	1.276	0.987	1.651
College Degree	1.183	0.912	1.535
Graduate Degree	1.174	0.799	1.724
Education Missing	1.942 ^{**}	1.298	2.906

Notes: Weighted data.

F (48, 81) = 12.76, p<.001.

a. Reference trajectory group is *high desister*

b. Demographic characteristic reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, household income=>\$50,000, parental education (highest)=high school diploma.

*** p<.001 ** p<.01 * p<.05.

Table 3.4 Parameter Estimates (Standard Errors), Model Selection Criteria, and Percent Distribution of Trajectories for 4-Group Model: Females (n=6,107)

<i>Groups</i>	Parameter Estimates ^a			Model Selection Criteria		Percent Distribution	
	β_0	β_1	β_2	AvePP	OCC	Population	Sample
Low Desister	4.516 ^{***} (0.661)	-4.402 ^{***} (0.661)	b	.815	3.392	56.5	65.6
High Desister	-13.583 ^{***} (2.332)	19.126 ^{***} (2.295)	-6.599 ^{***} (0.372)	.740	10.903	20.7	17.9
Chronic Perpetrator	4.007 ^{***} (0.791)	-3.896 ^{***} (0.849)	-0.854 ^{***} (0.209)	.826	42.724	10.0	7.6
Late Escalator	-7.075 ^{***} (1.003)	2.495 ^{***} (0.344)	b	.840	36.089	12.7	8.8

Notes: Weighted data.

BIC= -17877.06.

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j Age_{it} + Age_{it}^2 + Age_{it}^3$ where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j Age_{it} + Age_{it}^2 + Age_{it}^3}$.

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

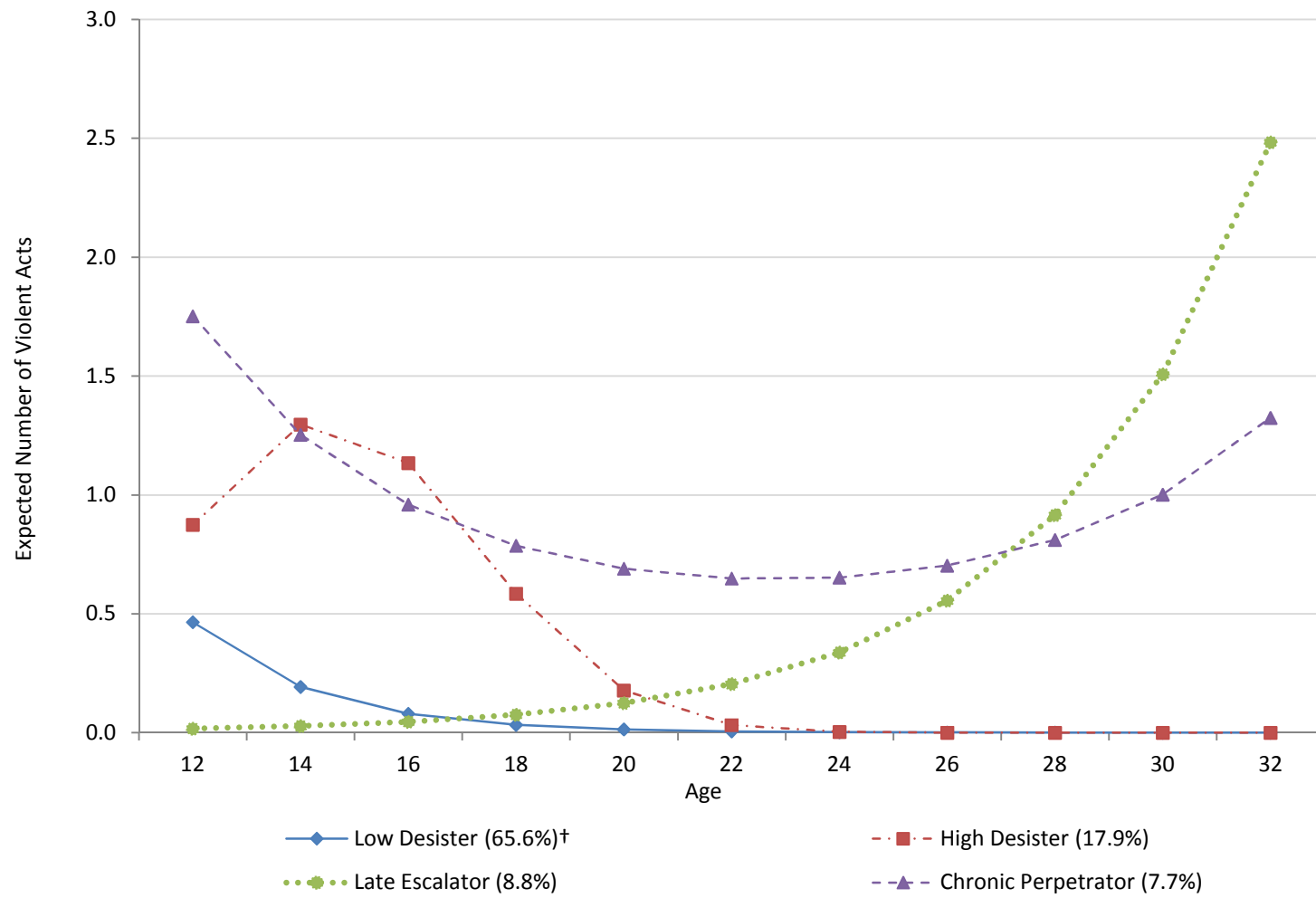


Figure 3.2 Females: Trajectories of Violent Behaviors by Age and Gender (n=6,701)

† Sample Percentage

Table 3.5 Relative Risk Ratios (RRR) for Group Membership by Wave 1 Demographic Control Variables: Females (n=6,107)

<i>Independent Variables^b</i>	High Desister^a (n=1,100)			Chronic Perpetrator^a (n=518)			Late Escalator (n=569)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
Race/Ethnicity									
Black/African American	1.700 ^{***}	1.340	2.158	2.965 ^{***}	2.086	4.214	1.309	0.948	1.808
Hispanic/Latino	1.613 ^{**}	1.197	2.173	1.594 [*]	1.056	2.405	0.874	0.588	1.300
Other	1.618	0.979	2.673	1.567	0.694	3.536	0.730	0.345	1.545
Asian American	1.588 [*]	1.090	2.312	1.218	0.643	2.306	1.436	0.924	2.233
Family Structure									
Parent and Step-parent	1.451 ^{**}	1.110	1.897	1.336	0.957	1.845	1.237	0.897	1.706
Single Mother or Single Father	1.598 ^{***}	1.263	2.022	1.004	0.735	1.370	1.207	0.890	1.636
Other	2.354 ^{**}	1.462	3.790	1.847 [*]	1.074	3.177	2.107 [*]	1.161	3.825
Household Income									
≤ \$25,000	1.306	0.981	1.739	1.596	0.977	1.608	1.172	0.800	1.715
> \$25,000 ≤ \$50,000	0.987	0.734	1.327	0.909	0.559	1.477	1.021	0.764	1.365
Income Missing	1.234	0.902	1.688	1.265	0.745	2.149	1.125	0.764	1.657
Parental Education									
Less than High School	0.910	0.675	1.228	1.023	0.657	1.592	0.980	0.663	1.448
Some College	0.781 [*]	0.622	0.901	0.768	0.530	1.113	0.808	0.585	1.117
College Degree	0.621 ^{***}	0.494	0.783	0.492	0.322	0.750	0.777	0.563	1.071
Graduate Degree	0.447 ^{***}	0.302	0.661	0.493	0.253	0.960	0.953	0.670	1.338
Education Missing	0.635	0.401	1.004	1.550	0.875	2.747	0.806	0.442	1.470

Weighted data.

F (45, 84) = 6.85, p<.001.

a. Reference trajectory group is *low desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, household income=>\$50,000, parental education (highest)=high school diploma.

*** p<.001 ** p<.01 * p<.05.

Table 3.6 Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 Demographic Control Variables: Females (n=1,618)

<i>Demographic Characteristics^b</i>	Chronic Perpetrator^a (n=518)		
	<i>RRR</i>	<i>95% CI</i>	
Race/Ethnicity			
Black/African American	1.744 **	1.206	2.520
Hispanic/Latino	0.988	0.607	1.609
Other	0.969	0.365	2.571
Asian American	0.767	0.364	1.618
Family Structure			
Parent and Step-parent	0.921	0.620	1.367
Single Mother or Single Father	0.628 **	0.444	0.889
Other	0.785	0.394	1.563
Household Income			
≤ \$25,000	1.222	0.744	2.007
> \$25,000 ≤ \$50,000	0.921	0.537	1.578
Income Missing	1.026	0.612	1.718
Parental Education			
Less than High School	1.124	0.757	1.667
Some College	0.983	0.683	1.415
College Degree	0.791	0.479	1.307
Graduate Degree	1.104	0.548	2.224
Education Missing	2.443 *	1.233	4.839

Notes: Weighted data.

F (45, 84) = 6.85, p<.001.

a. Reference trajectory group is *high desister*

b. Demographic characteristic reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, household income=>\$50,000, parental education (highest)=high school diploma.

*** p<.001 ** p<.01 * p<.05.

Table 3.7 Parameter Estimates (Standard Errors), Model Selection Criteria, and Percent Distribution of Trajectories for 4-Group Model: Males (n=5,090)

<i>Groups</i>	Parameter Estimates ^a			Model Selection Criteria		Percent Distribution	
	β_0	β_1	β_2	AvePP	OCC	Population	Sample
Low Desister	2.697 ^{***} (0.351)	-2.581 ^{***} (0.246)	b	.791	4.320	46.7	53.6
High Desister	-7.375 ^{***} (1.237)	9.841 ^{***} (1.438)	-3.115 ^{***} (0.406)	.705	7.019	25.4	26.1
Chronic Perpetrator	0.161 ^{**} (0.045)	b	b	.882	48.188	19.1	15.2
Late Escalator	-7.801 ^{***} (1.613)	2.690 ^{***} (0.549)	b	.823	31.659	8.8	5.1

Notes: Weighted data; BIC= -25839.81.

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j Age_{it} + Age_{it}^2 + Age_{it}^3$ where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j Age_{it} + Age_{it}^2 + Age_{it}^3}$.

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

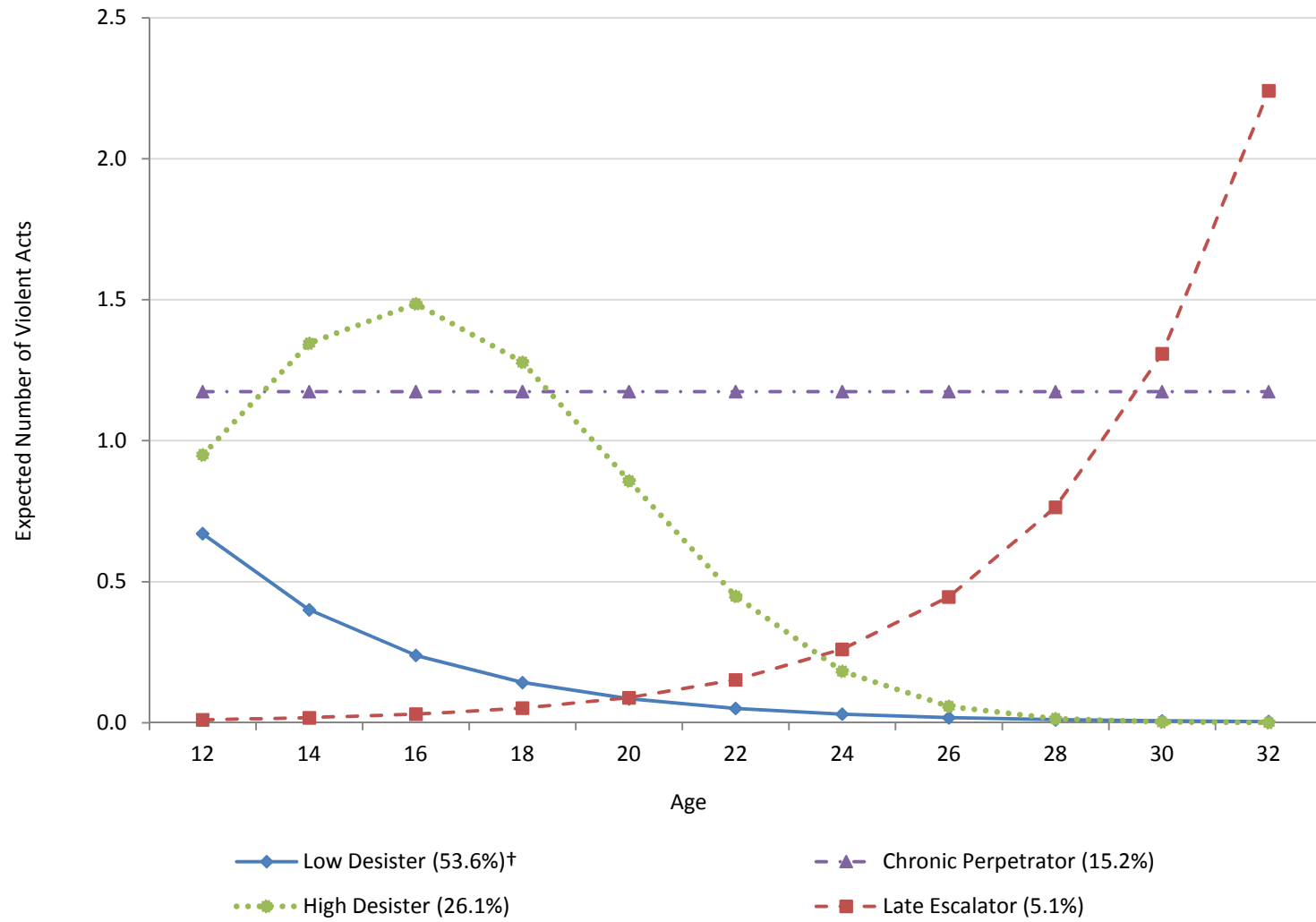


Figure 3.3. Males: Trajectories of Violent Behaviors by Age and Gender n=5,090

†Sample Percentages

Table 3.8 Relative Risk Ratios (RRR) for Group Membership by Wave 1 Demographic Control Variables: Males (n=5,090)

<i>Independent Variables^b</i>	High Desister^a (n=1,284)			Chronic Perpetrator^a (n=780)			Late Escalator (n=265)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
Race/Ethnicity									
Black/African American	1.321	0.964	1.810	1.272	0.936	1.728	1.996**	1.212	3.287
Hispanic/Latino	1.391	1.002	1.930	1.468*	1.090	1.977	1.440	0.781	2.654
Other	1.714	1.062	2.764	2.116*	1.108	4.041	1.112	0.369	2.718
Asian American	0.692	0.434	1.103	0.465*	0.220	0.983	1.063	0.571	1.979
Family Structure									
Parent and Step-parent	1.135	0.882	1.461	1.753***	1.312	2.342	1.546	0.976	2.450
Single Mother or Single Father	1.291*	1.016	1.640	1.875***	1.418	2.479	1.108	0.705	1.742
Other	1.202	0.733	1.972	1.513	0.878	2.607	0.751	0.298	1.890
Household Income									
≤ \$25,000	1.415*	1.018	1.968	1.560*	1.101	2.210	1.115	0.610	2.035
> \$25,000 ≤ \$50,000	1.209	0.921	1.587	1.257	0.919	1.719	1.150	0.674	1.965
Income Missing	1.210	0.846	1.731	1.273	0.875	1.852	1.416	0.845	2.374
Parental Education									
Less than High School	1.163	0.820	1.649	0.881	0.570	1.360	0.940	0.468	1.888
Some College	0.704*	0.524	0.945	0.961	0.699	1.322	0.980	0.615	1.562
College Degree	0.623**	0.469	0.828	0.827	0.610	1.121	0.975	0.597	1.592
Graduate Degree	0.698*	0.503	0.967	0.633**	0.436	0.919	1.294	0.764	2.191
Education Missing	0.812	0.517	1.275	1.308	0.780	2.194	0.528	0.189	1.477

Weighted data.

F (45, 84) = 2.31, p<.001.

a. Reference trajectory group is *low desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, household income=>\$50,000, parental education (highest)=high school diploma.

*** p<.001 ** p<.01 * p<.05.

Table 3.9 Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 Demographic Control Variables: Males (n=2,064)

<i>Demographic Characteristics^b</i>	Chronic Perpetrator^a (n=780)		
	<i>RRR</i>	<i>95% CI</i>	
Race/Ethnicity			
Black/African American	0.963	0.692	1.341
Hispanic/Latino	1.056	0.689	1.620
Other	1.235	0.646	2.360
Asian American	0.671	0.351	1.283
Family Structure			
Stepparents	1.544*	1.052	2.267
Single Mother or Single Father	1.453*	1.043	2.023
Other	1.259	0.699	2.268
Household Income			
≤ \$25,000	1.102	0.755	1.609
> \$25,000 ≤ \$50,000	1.040	0.734	1.472
Income Missing	1.052	0.714	1.549
Parental Education			
Less than High School	0.757	0.493	1.164
Some College	1.367	0.995	1.877
College Degree	1.327	0.941	1.871
Graduate Degree	0.907	0.572	1.439
Education Missing	1.611	0.930	2.789

Notes: Weighted data.

F (45, 84) = 2.31, p<.001.

a. Reference trajectory group is *high desister*

b. Demographic characteristic reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, household income=>\$50,000, parental education (highest)=high school diploma.

***p<.001 **p<.01 *p<.05.

CHAPTER 4: RESULTS

SOCIAL RELATIONSHIPS AND VIOLENCE TRAJECTORIES

This chapter elucidates the influence of social relationships on violent behaviors from adolescence through early adulthood into adulthood to address Specific Aim 2. First, this chapter discusses the extent to which adolescents' relationships with others shape the course of the initiation, persistence, and/or cessation of violent acts over time. The analysis is for the full sample, controlling for gender; chapter 5 presents gender-stratified analyses. The current chapter then examines the degree to which early adulthood social relationships differentiate groups that have similar violence levels in adolescence but then follow distinctly different trajectories during the transition to early adulthood. Finally, this chapter describes the extent to which stability and change in social relationships influence trajectories of violence.

The trajectories of violence identified in Chapter 3 (See Figure 3.1, page 78) comprise the outcome variables for the analyses in this chapter: the *low desister* (the reference trajectory), *high desister*, *chronic perpetrator*, and *late escalator* trajectories. As described earlier, acts of violence among the *low desister* group are minimal at baseline and thereafter steadily decline before ceasing. Persons in the *high desister* group, in contrast, enact greater violence at baseline, increase their violence before steeply decreasing it and then desisting from it in adulthood. The people in the *chronic perpetrator* group commit more than 1 act of violence out of a possible 5 acts of violence per year in adolescence and continue to do so over the entire follow-up period. Finally, people in the *late escalator* group engage in fewer violent behaviors than the people in the *low desister* group at baseline but increase their violence at an

accelerating pace during adulthood. The largest of these groups are the *low desisters* followed by the *high desisters*; the smallest is the *late escalator*.

4.1. WAVE 1 SOCIAL RELATIONSHIPS AND VIOLENCE TRAJECTORIES

The influence of social relationships and baseline demographic characteristics on the probability of belonging to each of the four trajectory groups is presented in Table 4.1. (See Table 3.2 for baseline demographic characteristics only). These results are based on a multinomial logistic regression with the *low desister* group as the reference. The *low desister* group was selected as the reference because it has the least involvement in violence relative to the other groups—it has a low initial value and desists earliest, which makes it a good comparison for other groups that are in some ways more violent. As can be seen in Table 4.1 the LR χ^2 test indicates that we can reject the null hypothesis that all of the coefficients in the model equal 0.

As also shown, the probability of belonging to these groups significantly differs with regards to only some demographic characteristics. Net of other variables in the model, race/ethnicity is the sole demographic characteristic that differentiates membership in the *low desister group* from all three other groups, with non-Hispanic whites generally being more likely than African Americans and Latinos to be in the *low desister* one than the other three. Except for Asian Americans, racial/ethnic minority groups are more likely than non-Hispanic whites to be in the *chronic perpetrator* than the *low desister* group. Males are more likely than females to be in two groups (relative to *low desisters*): *high desisters* and *chronic desisters*; the other

comparison is not statistically significant. Family structure and parental income play only a limited role when other factors are held constant, although parental education is inversely associated with membership in the *high desister* and *chronic perpetrator* groups relative to the *low desister* group.

The primary independent variables of interest in this analysis are social relationships with parents, friends, and romantic partners at baseline when respondents were an average of roughly 15 years of age, with a range of 12 to 18 years. The measures of parental relationships in this analysis are attachment to a residential parent and a history of child abuse by one's parent. Parental attachment is rated from 1 for "not very attached" to 5 for "very attached". Child abuse asks how often a parent hit, kicked, or threw respondent down and ranges from 0= "never" to 12 times. The operationalization of relationships with friends in Wave 1 is as follows: the frequency that a person had contact with friend(s) in a week, ranging from 0= "not at all" to 3= "more than 5 times"; the number of close delinquent friends (0-3); and the extent that a person perceived friends care for him/her, rated from 1 to 5 where 1= "not at all" and 5= "very much". The presence of a romantic relationship (0= "no"; 1= "yes") is the sole measure of this type of relationship. Risk factors for violent behaviors included in the model are: drinking on a regular basis, smoking on a regular basis, and violence victimization (all scored 0= "no" and 1= "yes").

4.1.1 Membership in the High Desister Group Relative to the Low Desister Group

This section describes the risk of being in the *high desister* group compared to the *low desister* group, as shown in Column I of Table 4.1. This analysis examines whether adolescent

social relations help to explain why people follow one of these trajectories rather than the other, controlling for demographic characteristics. Throughout this section, risk of membership in the *high desister* group is always relative to the *low desister* group.

Social Relationships. Of the six relationship variables, only one—a person’s attachment to his/her parent—does *not* significantly differentiate being in the *high desister* group, adjusting for other variables in the model. The sole variable that decreases the risk of being in the *high desister* group is the extent to which the adolescent perceived friends as caring for him/her. That is, people with higher values on the friends care scale are less likely than people with lower values to be in the *high desister* group. A 1-unit increase on the scale decreases the risk of membership in the *high desister* group by a factor of 0.877; comparing the extreme values (5 versus 1 on the scale) decreases this risk by a factor of 0.592 (0.877^4). The frequency of associating with friends during adolescence is positively associated with the risk of being in the group that desists later versus the one that desists earlier, other factors held constant. The effect is small—a 1-unit increase on the 4-point scale increases the risk of being in the *high desister* group by 1.088. In addition, the more delinquent friends, the more likely the person will be in the *high* than *low desister* group. Specifically, each delinquent friend increases the risk of membership in the *high desister* group by a factor of 1.320. A person who had three delinquent friends, for instance, has over 2 times ($1.320^3=2.30$) the risk of being in the *high desister* group than a person who had no delinquent friends. Having (versus not having) a romantic partner in adolescence increases the risk of being in the *high desister* group by about 32%.

Risk Factors. All three adolescent risk factors increase the probability of being in the *high desister* group when all the other variables are held constant. Smoking and drinking regularly versus abstaining have small and moderate associations, respectively. Violence victimization, however, has a very strong association with group membership. Specifically, the probability of being in the *high desister* group increases by a factor of 4.178, or 317.8% $([4.178 - 1.000] \times 100)$, for people who experienced violence victimization in adolescence relative to those who did not.

4.1.2 Membership in the Chronic Perpetrator Group Relative to Low Desister Group

At issue is the extent to which social relationships in adolescence explain why some violent adolescents continue to engage in high levels of violent behaviors through adulthood whereas others follow a different path and end their lesser participation in violence early in the transition to adulthood. The predictors of being in the group of *chronic perpetrators* are presented in Column II of Table 4.1. In this section, the risk of being in the *chronic perpetrator* group is understood to be relative to the *low desister* group.

Social Relationships. Three of the five Wave 1 relationship variables that are significantly associated with membership in the *high desister* group also are statistically significant predictors of membership in the *chronic perpetrator* group. These three variables are parental child abuse, the number of delinquent friends, and the frequency of contact with friends. The frequency of associating with friends in adolescence has a small effect such that a person who had a single contact with friends in a week has an increased risk of a factor of 1.106 for being in the *chronic perpetrator* group compared to a person who had no contacts with

friends. The increased risk for having close delinquent friends is 1.207 times when comparing 0 to 1 delinquent friend and 1.758 times for 3 delinquent friends.

Risk Factors. Smoking on a regular basis in adolescence is the only one of the three risk factors that is *not* significantly associated with membership in the *chronic perpetrator* group. The risk of being in this group is higher for people who drank regularly in adolescence than those who abstained, but the magnitude is relatively small. The magnitude of the effect of experiencing violence victimization as an adolescent, however, is very large. Specifically, it increases the risk of being in the *chronic perpetrator* group by 291.9%.

4.1.3 Membership in the Late Escalator Group Relative to the Low Desister Group

The relative risk ratios for being in the *late escalator* group compared to the *low desister* group are reported in Column III of Table 4.1. Only a few variables significantly differentiate the risk of being in this group. As mentioned earlier, people in the *late escalator* group engage in fewer violent behaviors than the people in the *low desister* group at baseline. However, they increase their violence over time whereas people in the *low desister* group decrease theirs and ultimately desist. This analysis examines whether social relationships in adolescence help to explain why people who are not violent become more violent over time while people who are violent desist in their behaviors over time. Reference to the risk of being in the *late escalator* group is always relative to the *low desister* group in the following sections.

Social Relationships. The only two social relationship variables that are statistically significant in this comparison, net of other variables in the model, are the number of delinquent friends in adolescence and the number of times a person experienced child abuse, both of

which increase the risk of being in the *late escalator* group. Each additional close delinquent friend a person had in adolescence increases the risk of membership in the *late escalator* group by a factor of 1.132. The number of times a person was abused by a parent has a significant effect on membership in the *late escalator*. Each additional act of abuse increases this risk by a factor of 1.057. Compared to a person who had never been abused as a child, a person who experienced child abuse five times has an increased risk of being in the group of *late escalators* by a factor of 1.319. This risk increases by 1.741 times for people who have been victims of child abuse on at least 10 occasions compared to people who have never been victims of child abuse.

Risk Factors. A person who smoked regularly during adolescence has a higher risk of being in the *late escalator* group than someone who did not. The magnitude of this relationship is moderate. It is the only statistically significant risk factor that predicts membership in this group.

4.1.4 Membership in the Chronic Perpetrator Group Relative to the High Desister Group

In the analysis just reported, the risk of being in each trajectory group was evaluated relative to being in the *low desister* group, but one additional comparison is of particular interest, the risk of being in the *chronic perpetrator* relative to the *high desister* group. This is a valuable comparison because these two groups have high involvement in violence during adolescence and follow a similar initial trajectory until their paths diverge in early adulthood, with one retreating from violence and the other remaining engaged. Therefore the multinomial logistic regression model was re-estimated with the *high desister* group as the reference. Only

the coefficients for the risk of being in the *chronic perpetrator* group are presented and interpreted in Table 4.2 to avoid multiple unnecessary tests of statistical significance for contrasts aside from the one of interest.

None of the Wave 1 social relationship variables are statistically significant predictors of the risk of being in the *chronic perpetrator* group net of the other variables in the model. Only demographic characteristics are significant when all the other variables are held constant. Compared to females, males have moderately increased risk of being in the persistently violent group relative to the high desister one. Compared to those who lived with two biological parents as an adolescent, people who lived with a parent and step-parent have increased risk of being in the *chronic perpetrator* group. However, the magnitude is small. Self-identifying as Asian American (compared to non-Hispanic White) is a statistically significant predictor with lower risk of being in the *chronic perpetrator* than the *high desister* group. Missing on parental education also is significant.

4.2. WAVE 3 SOCIAL RELATIONSHIPS: CHRONIC PERPETRATORS VERSUS HIGH DESISTERS

This section examines the extent to which social relationships in early adulthood alter or reinforce the course of violent behaviors set during adolescence. This analysis differs from the previous analysis by additionally taking into consideration Wave 3 social relationships. Specifically, Wave 3 relationships are examined as determinants of membership in the *chronic perpetrator* versus the *high desister* group—the ones that were examined in last step of the previous analysis. As just mentioned, these two groups have similar levels of violence at Wave 1

and then diverge as people enter early adulthood, with members of the *chronic perpetrator* group continuing their participation in violent acts while those in the *high desister* group decrease and then discontinue their earlier violent behavior.

Wave 3 social relationships occur later in time than the Wave 1 and Wave 2 acts of violence that contribute to the elevation and shape of the trajectories. However, it is appropriate to examine the impact of Wave 3 social relationships for this comparison because these relationships are concurrent with the changes in violent behavior that make these groups diverge. In contrast, Wave 3 variables are not viable independent variables for other contrasts among the four groups because these groups have different initial levels of violence and follow different courses before *and* after Wave 3, which is problematic because Wave 3 cannot predict the earlier values. A multinomial regression based on the four groups was estimated to maintain comparability with the previous analyses, but only the coefficients for the risk of being in the *chronic perpetrator* versus the *high desister* group are presented and interpreted.

The early adulthood (Wave 3) social relationships are the same types of relationships explored previously for adolescence. They are relationships with parents, friends, and romantic partners. All the social relationship and risk factor variables from adolescence are included in the model, along with the sociodemographic control variables. The Wave 1 social relationship and risk factor variables and their scoring are given above (see Section 4.1). The Wave 3 social relationships variables are the same as Wave 1 for parental attachment and violence victimization and for the risk factors of drinking regularly and smoking regularly. Two social relationship variables are scored differently at Wave 3 than Wave 1. First, the frequency of contact with friends, the sole measure of relationships with friends in early adulthood, is scored

from 0 for “never” to 7 for “at least seven times” (its upper limit was 3+ at Wave 1). Second, the Wave 3 romantic relationship measure has more categories than at Wave 1 (yes, no): married, cohabitating, no relationship (omitted reference), and “other”. In addition, a single item measure of predilection for taking risks in early adulthood is rated from 1= “strongly disagree” to 5= “agree”.

As briefly described above, the *high desister* and *chronic perpetrator* groups have the similar baseline levels of violence in adolescence and diverge after the people in the groups are about 18 years old. The *high desister* group declines quickly and desists whereas the *chronic perpetrator* group maintains an average of about 1 act of violence per year from adolescence into adulthood.

Social Relationships. As shown in Table 4.3, the only relationship variable from adolescence (Wave 1) that is statistically significant in this analysis, which includes Wave 3 relationship variables as well as risk factors and control variables, is the number close friends who smoked cigarettes, drank alcohol, and/or smoked marijuana. With each additional friend that engaged in what are illicit behaviors in adolescence, there is a 9.1% decrease in the risk of being in the *chronic perpetrator* than the *high desister* group. This effect is moderate, such that a person who associated with three delinquent friends has a 24.9% decreased risk of membership in the *chronic perpetrator* group than someone who had no delinquent friends during adolescence.

Of the three Wave 3 social relationship variables, only romantic relationship status is statistically significant, adjusting for the other variables in the model. Married people are less

likely than people who are not in a relationship to be in the *chronic perpetrator* than the high desister group.

Risk Factors. Among the risk factors, only those from early adulthood are statistically significant in differentiating between the *chronic perpetrator* and *high desister* groups. The two Wave 3 risk factors that increase the relative risk of being in the *chronic perpetrator* group are a predilection for taking risks and violence victimization. Liking to take risks has a significant effect such that the difference between the lowest and highest values on the scale (1 versus 5) increases these this risk by 1.749 times. Violence victimization also has a moderate effect. Net of the other variables in the model, Wave 1 risk factors are not statistically significant. Because these two trajectory groups have similar baseline acts of violence, risk factors at Wave 1 were not expected to contribute much to predicting group membership when Wave 3 variables are in the model because Wave 3 is the point of divergence.

Demographic Control Variables. As also shown in Table 4.3, only two of the five Wave 1 demographic control variables are statistically significant when social relationship and risk factor variables are held constant. Males are more likely than females to be in the group that continues to perpetrate violence compared to the group that desists. However, the gender difference is small. Missing on education also is significant. This analysis is noteworthy because race/ethnicity is not statistically significant unlike its important role in other analyses (e.g., see Tables 3.2, 4.1, 4.2).

4.3. COMPOSITION OF TRAJECTORY GROUPS IN EARLY ADULTHOOD AND ADULTHOOD

This section describes the composition of these groups with regard to their Wave 3 and Wave 4 social relationships and risk factors. This is an entirely descriptive analysis because of the issue of the timing described above. That is, the Wave 3 and Wave 4 variables cannot be used to determine membership in these groups because they are defined by violence acts that occur earlier in time. For this reason, there are no tests of statistical significance and the groups are not compared to each other. Instead each one is described in and of itself. However, each is compared to the total distribution of the Wave 3 and Wave 4 variables because this distribution describes the full sample and therefore gives a sense of what is average or typical as a yardstick for evaluating to composition of any of the groups. Table 4.4 presents the distribution of Wave 3 and Wave 4 social relationships and risk factors for the full sample and for each of the four groups.

4.3.1 Characteristics of the Full Sample at Wave 3 and Wave 4.

As shown to the right of Table 4.4, people in the sample, on average, reported a secure attached relationship with their parents in young adulthood. Although attachment is somewhat higher at Wave 3 than Wave 4 (by about 0.5), people generally were still securely attached to their parents in adulthood. Slightly over one-third of the sample was not in a romantic relationship at Wave 3 and another third were in some “other” relationship (e.g., in a relationship, but not cohabitating or married); both of these relationship types are much less common at Wave 4. Although only two in ten persons are married in early adulthood, that number climbs to four in ten by adulthood. About one in five persons were in cohabitating

relationships at Wave 3, a value that remains stable at Wave 4. Overall, then, marriage is relatively uncommon in early adulthood but has become the predominant relationship category by adulthood, a pattern that is reflected in the declining pool of persons who are not in a relationship. People in the full sample had contact with their friends about four days a week on average in early adulthood. They also reported having about 4 close friends in Wave 4.

On average, people in the full sample had about equally mixed neutral scores on the risk-taking scale in Waves 3 and Wave 4 in that the average indicates that people neither agreed nor disagreed about liking to take the risks cited on the question. The average risk-taking score decreased by 0.5 from Wave 3 to Wave 4. A little less than half of the sample reported smoking or drinking in Wave 3. The prevalence of smokers in Wave 4 was lower than in Wave 3 by 5%. The proportion of drinkers was higher in Wave 4 than in Wave 3; however, this difference is minimal. Five percent of the full sample had experienced violence victimization for the first time at Wave 3. At Wave 4, over one-fifth of the sample had experienced violence victimization for the first time. That is, 21.1% of the sample reported never having an occurrence of victimization between Waves 1-3 and then reported an occurrence within 12 months prior to their Wave 4 interview.

4.3.2 Characteristics of the Low Desister Group at Wave 3 and Wave 4

About 60% of the sample is assigned to the *low desister* group based on their highest probability of assignment, as explained in Chapter 3. It is the largest group and its composition is presented in Column I of Table 4.4.

Overall, the distributions of the Wave 3 and Wave 4 social relationships for this group are reflective of the distributions for the full sample. The average parental attachment score is high and slightly higher than the average for the full sample. The proportion of each of the romantic relationships is similar to the proportions for the sample overall in both early adulthood and adulthood. The average number of times people had contact with their friends in Wave 3 also is comparable to that of the full sample. The number of close friends in adulthood that this group reported is marginally higher than for the full sample.

The people in this group were about equally mixed about whether or not they liked to take risks. A smaller proportion smoked in Waves 3 and 4 than in the full sample by about 6-7%. The prevalence of drinkers is similar to the respective waves in the sample overall. The proportion who experienced violence victimization in Wave 3 is slightly smaller than for the full sample. However, the prevalence of people who were victims of violence in Wave 4 is disproportionately smaller in the *low desister* group than in the full sample by 12%.

4.3.3.Characteristics of the High Desister Group at Wave 3 and Wave 4

About one-fifth of the sample was assigned to the *high desister* group based on highest posterior probability. As described previously, this group has relatively high levels of violence in adolescence and thereafter steadily declines through early adulthood and desists in adulthood. As can be seen in Column II of Table 4.4, its composition differs only slightly from that of the full sample for most characteristics.

Although the proportions of the four categories of romantic partner status at Wave 4 are similar to the proportions of these categories for the full sample, they are slightly different

at Wave 3. The prevalence of people who are not in a relationship or people in an “other” relationship in the *high desister* group is lower than these types in the overall sample. In contrast, the prevalence of people who were cohabitating or married in this group is higher by 3-4%. On average, people in this group indicated a fewer number of friends in adulthood than everyone in the sample.

On average, people in the *high desister* group reported liking to take risks somewhat more than the sample overall. The percentage of people in the *high desister* group who smoke on a regular basis is about 10% more than the percentage of regular smokers in total. Although the distribution of victimization at Wave 3 is similar to the full sample, the prevalence of people who reported violence victimization at Wave 4 is lower in the *high desister* group by 7%.

4.3.4 Characteristics of the Chronic Perpetrator Group at Wave 3 and Wave 4

This group comprised 11.6% of the sample and has persistently high levels of violence from adolescence to adulthood. As shown in Column III of Table 4.4, the composition of this group differs somewhat from the composition of the full sample in terms of social relationships and risk factors at Waves 3 and 4.

The people in the *chronic perpetrator* group are slightly less securely attached to their parents than the sample as a whole. A more substantial difference is seen for romantic relationships. A higher percentage was cohabitating than in the sample by about 5%. In contrast, the percentage that was married was 5% lower. Although people had contact with their friends with more frequency in early adulthood than the sample in general, they reported a fewer number of close friends in adulthood.

Although the people in this group indicated a disposition for taking risks in early adulthood, they were equally balanced between being positive and negative about risk taking in adulthood. This group has a higher prevalence of alcohol drinkers and smokers in early adulthood and adulthood than the full sample. The *chronic perpetrator* group also has a disproportionately high percentage of people who reported violence victimization for the first time in Wave 3 and Wave 4. The proportions who were victims of violence is more than two times that of the full sample at Wave 3 and almost three times that of the full sample at Wave 4.

4.3.5 Characteristics of the Late Escalator Group at Wave 3 and Wave 4.

The smallest proportion of the sample was assigned to the *late escalator* group. It comprises 7% of the sample. This group starts with no violence in adolescence which then increases in late adolescence and accelerates thereafter. As can be seen in Table 4.4, Column IV, this group is comparable to the full sample on some variables but is considerably different in terms of risk factors.

People in the *late escalator* group reported a similar average parental attachment score as the full sample in Waves 3 and 4—they are generally securely attached to their parents. Although the distributions of the romantic relationship categories are similar to the full sample, the *late escalator* group has a slightly larger percentage who were married in Waves 3 and 4 and correspondingly smaller percentage not in a relationship. People in this group had contact with their friends with similar frequency as the full sample, but had on average a smaller number of close friends in adulthood.

The distribution of people in the *late escalator* group who drank alcohol regularly in Wave 4 is slightly bigger than that of the full sample by about 4%. Although the percentage who were victims of violence in Wave 3 is similar to the percentage in the full sample, there is a substantial difference at Wave 4. The proportion of who experienced violence victimization for the first time before Waves 3 and 4 is almost four times that of the full sample. In fact, a nearly inverse pattern can be seen: more than 80% of people in the *late escalator* group were victims of violence in Wave 4, whereas almost 80% of people in the sample were not.

4.4. TIME VARYING RELATIONSHIPS AND VIOLENCE TRAJECTORIES

This section investigates how the changing nature of people's relationships with their parents across time affects violence trajectories and explicates whether the presence of romantic partnerships influences violence trajectories from adolescence into adulthood. A group based trajectory model incorporating time varying covariates into the specification of the trajectory was used for this analysis (Jones & Nagin, 2007; Nagin, 2005). Specifically, the time-varying covariates of closeness to parents and romantic relationships in Waves 1-4 were each modeled with the trajectory specifications established in Chapter 3 for the full sample. These are the only relationship variables that were measured in a consistent way across all waves of data collection. These two types of relationships are modeled separately because the results are close to impossible to interpret when modeled together. The dependent variable for these analyses are violence counts in Waves 1-4 and the independent variable is age as before.

This approach treats the person’s trajectory group membership as fixed and information on the violent behavior of group members who do and not have an event are used to infer the impact of this event on the course of violence in that group (Jones & Nagin, 2007; Nagin, 2005). Nagin and Jones point out that this approach is consistent with a life course perspective with respect to idea that trajectories condition the impact of an event, in particular “turning points”. Specifically, this approach considers the impact of the event among people who have *similar* developmental trajectories, which helps avoid selection effects. This approach generalizes from an event (yes/no) in this case, whether the person is in a romantic relationship, to continuous covariates, that is, to a matter of degree, in this case, the extent of closeness to a parent. There are no covariates in these models because trajectories can be interpreted as the “prototypical developmental path of trajectory group members, averaged over all the contingencies that might cause individual variation about this developmental course” (Nagin, 2005, p. 124).

4.4.1 Parental Closeness as a Time Varying Covariate

The addition of parental closeness as a time varying covariate results in an equation of the following type for each trajectory group:

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2 + \alpha_1^j Closeness_{it} \quad (4.1)$$

where $Closeness_{it}$ is a scale variable that equals the value of parental closeness subject i reports in Wave t . The range of values on the scale is 1-5 where 1= “not at all close” and 5= “very much”. The effect of parental closeness varies freely across groups, which allows for the testing of differential effects (Jones & Nagin, 2007). The α ’s are superscripted by j ’s to denote that each of the parameters is specific to each trajectory (Nagin, 2005). As before, self-reported

violence frequency is modeled following a zero-inflated Poisson distribution and each trajectory is defined by the rate parameter, λ_{it}^j , over time. Age_{it} is the age of individual i at time t and Age_{it}^2 is the square of the age of person i at time t . The β coefficients determine the shape of the trajectories and the superscript j indicates that the coefficients are not constrained to be the same across the j groups. This allows heterogeneity not only in the amount of violent behavior at a given age, but also in the development of violent behavior over time.

The results of the time-varying analysis of closeness to parents are provided in Table 4.5. The estimates of parental closeness are all negative which indicate that greater closeness is generally associated with less violence. The coefficients of this variable are statistically significant for the *low desister* and *chronic perpetrator* trajectories but not the other two trajectories.

A graphical representation of the estimated trajectories adjusted for parental closeness at different hypothetical levels facilitates interpretation of the estimates. Figure 4.1 presents the impact of closeness on violence trajectories for the *low desister* group and *chronic perpetrator* group. The figure shows the plots of the predicted trajectories for a hypothetical individual who has the sample mean value of parental closeness at each wave versus a hypothetical individual who has the lowest possible value (1) on the same scale at each wave. The mean values of parental closeness are: Wave 1 = 4.615; Wave 2 = 4.480; Wave 3 = 4.554; and Wave 4 = 4.614. These values indicate that on average people in the sample reported being very close to their parents across all four waves. The trajectories with the maximum score (5) on the scale are not presented in the figure because the mean scores are close to the maximum

and when graphed together it is difficult to visibly distinguish between the two plots. The minimum values at each wave are 1.

The levels of violence for someone in the *low desister* trajectory with parental closeness set at the mean versus the minimum value differ most in adolescence, as seen in Figure 4.1. The estimated difference in the rate of violence at age 12 is 0.6 acts of violence on a scale of 0 to 5 acts of violence in the past year. That is, a person with average levels of parental closeness is somewhat less violent than a peer who is “not at all close” to their parents during adolescence, especially early to mid adolescence. The rate of decline in violence over the course of adolescence is less steep for someone with average than minimal levels of closeness such that the estimated trajectories for the two hypothetical persons converge during early adulthood when both persons are projected to have ceased to be violent. Thus, the effect of parental closeness for the *low desister* trajectory seems to have the strongest effect in adolescence.

The levels of violence for the *chronic perpetrator* trajectory are stable over time because this trajectory is defined by an intercept only (see Table 4.5). That is, age does not influence the shape of this trajectory. The time-varying covariate of parental closeness affects the amount of violence, but the magnitude is small as shown in Figure 4.1. The difference between hypothetical persons with average and minimum value on the parental closeness scale is estimated to be 0.3 acts of violence on a scale of 0 to 5 acts at any given time, with the higher value yielding a lower violence count. Although the effect of parental closeness is stronger in early adolescence for the *low desister* trajectory as described above, its effect is essentially

constant over the period of adolescence through adulthood for the *chronic perpetrator* trajectory.

4.4.2 Romantic Partnership as a Time Varying Covariate: Turning Points

Next, the time-varying covariate of romantic partnership is examined. Applying Equation 4.1 using romantic partnership in lieu of parental closeness as the time varying covariate results in the following equation:

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Romantic}_{it} \quad (4.2)$$

where Romantic_{it} is an indicator variable that equals 1 if subject i reports being in a relationship in Wave t , and 0 if subject i reports not being in a relationship in Wave t . Note, it is not possible to determine whether this is the same relationship across time, and there may be unrecorded relationships between waves, or breaks in relationships.

The results of the analysis of romantic partnership on violence trajectories are provided in Table 4.6. The estimate of the coefficient for romantic partnership is negative for only the *late escalator* trajectory indicating that being in a romantic relationship is associated with less violence than not being in a relationship, but it is not statistically significant. The romantic partnership coefficients are statistically significant and positive for the *low desister*, *high desister*, and *chronic perpetrator* groups. This means that being in a romantic relationship is associated with higher violence frequencies for these three trajectories.

Graphical representation in Figures 4.2-4.5 allows for clearer interpretation of the effect of romantic partnership on the trajectories and whether romantic partnerships function as turning points for these three groups. These plots are for specific combinations of the presence

or absence of romantic partnerships over Waves 1 through 4. Figures 4.2-4.5 show the plots of the *low desister*, *high desister*, and *chronic perpetrator* trajectories for four hypothetical scenarios: (1) the presence of romantic relationships beginning in adolescence and continuing through adulthood, i.e., from Wave 1 to Wave 4; (2) the presence of a romantic partnership beginning in late adolescence and continuing thereafter, i.e., Waves 2 to 4; and (3) the presence of romantic relationships beginning in early adulthood and continuing to adulthood, that is from Wave 3 through Wave 4. Figure 4.5, in contrast, compares a person who had a romantic relationship from adolescence through adulthood, i.e., Waves 1 to 4, to someone who had a romantic relationship in adolescence only, i.e., Wave 1, but is not Waves 2-4. The concept of a turning point implies a change in status behavior for not being in a relationship versus entering which is depicted in Figures 4.3-4.4. Figure 4.5 examines a change of status from being in a relationship to not being as a turning point on violence trajectories.

Presence of Romantic Relationship from Early to Middle Adolescence to Adulthood.

Figure 4.2 shows trajectories for a hypothetical person who is always in a romantic relationship from adolescence onward compared to a hypothetical person who is never in one. The estimated trajectory for the *low desister* in a relationship at all four waves is higher during adolescence than the one for someone who is not in a relationship at any of these times. Beyond adolescence, these profiles have about the same estimated trajectory. Thus, among those who engage in minimal violence in adolescence and who desist early on, being in a romantic relationship increases the amount of violence during adolescence and only adolescence.

A similar pattern is seen for the *high desister* trajectories, as also shown in Figure 4.2. Being in a romantic relationship from adolescence onward, relative to ever, increases the amount of most violence profiles during adolescence, somewhat during early adulthood and not thereafter. In contrast, among the *chronic perpetrator* trajectories, being in a romantic relationship increases violence through this period of the life course.

Presence of Romantic Relationship from Middle to Late Adolescence to Adulthood.

Figure 4.3 has plots of the trajectories for a hypothetical person who is never in a relationship to a hypothetical person who is always in a relationship from mid adolescence onward. For the *low desister* trajectory, as seen in Figure 4.3, someone who enters into a romantic partnership at Wave 2 and remains in one through adulthood, has a negligible difference in violence compared to someone in the same group who is in a relationship at all four waves. Entering into a romantic partnership in middle to late adolescence for someone in the *high desister* trajectory, however, has a notable impact on violence trajectory compared to always not being in a relationship. As can be seen in Figure 4.3, a person in this group who is in a romantic relationship in late adolescence is estimated to have nearly 0.2 more acts of violence than had this person never been in a relationship throughout. The magnitude of this effect diminishes over time. Entering into a romantic partnership in late adolescence and continuing thereafter puts a person in the *chronic perpetrator* group on a trajectory of increased violence relative to a person who is not in a relationship from Wave 1 to Wave 4.

Presence of Romantic Relationship from Early Adulthood to Adulthood. The effect of romantic partnership is negligible for a person in the *low desister* trajectory who enters into one at Wave 3 and continues to Wave 4 compared to a person who is never in a relationship, as

shown in Figure 4.4. This emphasizes the points made about this group in previous sections describing Figures 4.2-4.3, that the effect of being in a romantic relationship is confined to early adolescence and adolescence and becomes imperceptible in early adulthood.

Also as can be seen in Figure 4.4, a person in the *high desister* group without any romantic partnerships in adolescence who enters into one after age 18 has a trajectory with increased violence activity compared to a person who is not in a relationship. However, the impact of entering into a romantic relationship at Wave 3 is much smaller than entering into one during adolescence (see Figures 4.2 and 4.3).

As in the previous comparisons for the *chronic perpetrator* trajectory, the transition from being not in a relationship to being in one from early adulthood to adulthood acts as a significant determinant of violent behaviors. Figure 4.4 shows that late onset of a romantic relationship matters only among people who continue to perpetrate violence, indicating that it may be an important mechanism that precipitates or maintains violence among people who are predisposed to being violent.

Exiting a Romantic Partnership in Middle to Late Adolescence. In contrast to the above comparisons that examined the impact of entering into a relationship, Figure 4.5 considers the impact of leaving a relationship so that plots a hypothetical person who is always in a relationship to someone who is in a relationship only in early to middle adolescence. The effect is essentially the opposite of entering into a relationship. As seen in Figure 4.5, a person in the *low desister* group who exits a romantic relationship is on a trajectory of very slightly decreased violent activity in adolescence compared to a person who remains in one. For the *high desister* trajectory, however, the effect of exiting romantic partnership is stronger in magnitude than

that of the *low desister group*, and it is associated with a path with lower levels of violence until early adulthood. For the *chronic perpetrator* trajectory, leaving a romantic partnership, decreases levels of violence thereafter.

4.5. MAIN VERSUS CONDITIONAL EFFECTS OF SOCIAL RELATIONSHIPS ON VIOLENCE TRAJECTORIES

Several interactions between different types of relationships were tested to see if the effects of one type of relationship on violence trajectories are independent of the other or if they are conditional, for example parents and friends. A variety of product interaction terms were examined. These include: (1) parental attachment and delinquent friends in adolescence, (2) parental attachment and the extent that friends cared in adolescence, (3) parental attachment in adolescence and romantic partnership status in early adulthood, and (4) parental attachment and the presence/absence of an adult mentor in adolescence. The statistical significance of these interaction terms were tested by comparing the models with and without the interaction terms using the Wald test. None of these interactions were statistically significant at the .05 level of significance. It does not appear that there is an interaction between types of relationships and that main effects are the ones that matter.

A variety of interactions between parental relationships and violence victimization were also tested to examine whether relationships with parents amplify or dampen the effect of violence victimization. The following combinations of interactions were tested: (1) parental attachment in adolescence and violence victimization in adolescence, (2) parental child abuse and violence victimization in adolescence, (3) parental attachment in adolescence and violence

victimization in early adulthood, and (4) parental attachment in early adulthood and violence victimization in early adulthood. Again, the addition of these interactions yielded non-significant Wald-tests, indicating that it is the main effect of these relationships and experiences that are important.

4.6. CONCLUSION

This chapter discussed the results of a series of analyses examining the extent to which social relationships differentiate membership in four violence trajectory groups. To summarize briefly, the negative influences of some aspects of relationships with parents and friends differentiate group membership. Specifically, associating with friends who enact delinquent behaviors increases the probability of membership in a group that has a higher level of violence or is violent for a longer duration than the one that has a minimal level of violence and desists early. Similarly, increased frequency of associating with friends also elevates this risk. Although positive relationships with parents were not found to be significant predictors of group membership, experiencing child abuse by a parent increases the risk of being in a group with elevated or longer term violent behaviors.

Experiencing violence victimization is a very strong predictor of membership in a group that has elevated levels of violence. A person who experiences victimization for the first time in early adulthood is at increased risk of remaining in the group that continues to perpetrate violence at high levels versus desisting. Victimization has a very strong and consistent effect, holding all the other relationship, risk factor, and sociodemographic characteristics constant. Moreover, of all the Wave 3 and Wave 4 social relationships and risk factors examined for the

four trajectory groups (Section 4.3), violence victimization is the one variable for which there were disproportionate distributions across all groups in comparison to the full sample. In contrast to the full sample, the two groups that desist have similar or lower percentages of people who were victimized for the first time in early adulthood or adulthood, while this percentage is disproportionately large among the *chronic perpetrator* and *late escalator* groups. Thus, violence victimization is a major contributor to an increased probability of enacting high levels of violence for a long duration.

The analyses in this chapter on the time varying effects of parental closeness on trajectories revealed that a close parental relationship is most influential in lowering levels of violence during adolescence among people in the *low desister* group. In this same group, the presence of a romantic partnership amplifies violent behaviors, but again, only during adolescence. Being in a romantic partnership also leads to higher levels of violence in adolescence and early adulthood for people in the *high desister* group, and this impact is stronger in adolescence than in early adulthood. For people in the *chronic perpetrator* group, being close to one's parents and not having a romantic partnership at any point from adolescence to adulthood is related to decreased levels of violence.

Table 4.1 Relative Risk Ratios (RRR) for Group Membership by Wave 1 Social Relationships and Demographic Characteristics (n=11,197)

<i>Independent Variables^b</i>	I. High Desister^a (n=2,360)			II. Chronic Perpetrator^a (n=1,282)			III. Late Escalator^a (n=843)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>									
Attachment to Parent (1-5)	0.909	0.797	1.035	0.959	0.803	1.146	1.009	0.835	1.221
Child Abuse Victimization (0-12)	1.081 ^{***}	1.047	1.115	1.110 ^{***}	1.072	1.149	1.057 [*]	1.012	1.103
Friends Care (1-5)	0.877 ^{**}	0.795	0.966	0.941	0.815	1.088	0.983	0.848	1.138
Contact with Friends (0-3)	1.088 [*]	1.015	1.166	1.106 [*]	1.009	1.211	0.999	0.897	1.112
Delinquent Friends (0-3)	1.320 ^{***}	1.235	1.411	1.207 ^{***}	1.094	1.332	1.132 ^{**}	1.034	1.264
Romantic Partnership (0=no/1=yes)	1.319 ^{**}	1.119	1.555	1.244	0.981	1.577	1.116	0.939	1.440
<i>Risk Factors</i>									
Drink Alcohol (0=no/1=yes)	1.111 ^{***}	1.050	1.176	1.152 ^{***}	1.080	1.230	0.952	0.883	1.027
Smoke (0=no/1=yes)	1.296 [*]	1.056	1.590	1.242	0.971	1.588	1.341 [*]	1.016	1.770
Violence Victimization (0=no/1=yes)	4.178 ^{***}	3.488	5.003	3.919 ^{***}	3.244	4.733	1.017	0.757	1.366
<i>Demographic Characteristics</i>									
<i>Gender</i>									
Male	2.474 ^{***}	2.063	2.967	3.777 ^{***}	3.123	4.569	1.231	0.997	1.521
<i>Race/Ethnicity</i>									
Black/African American	1.721 ^{***}	1.401	2.115	1.978 ^{***}	1.474	2.653	1.686 ^{**}	1.254	2.268
Hispanic/Latino	1.648 ^{***}	1.256	2.162	1.437 ^{**}	1.095	1.885	1.113	0.792	1.566
Other	1.398	0.939	2.080	1.781 [*]	1.013	3.134	0.817	0.438	1.524
Asian American	1.237	0.859	1.782	0.731	0.461	1.159	1.145	0.824	1.592

Continues

Table 4.1 Continued

<i>Independent Variables^b</i>	I. High Desister^a (n=2,360)			II. Chronic Perpetrator^a (n=1,282)			III. Late Escalator^a (n=843)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
<i>Family Structure</i>									
Parent and Step-parent	0.934	0.774	1.126	1.250 [*]	1.006	1.553	1.192	0.914	1.556
Single Mother or Single Father	0.931	0.796	1.089	1.117	0.885	1.409	1.036	0.819	1.311
Other Family Structure	1.072	0.690	1.667	1.376	0.812	2.331	0.931	0.497	1.744
<i>Household Income</i>									
≤ \$25,000	1.476 ^{**}	1.113	1.958	1.631 ^{**}	1.215	2.189	1.353	1.000	1.831
> \$25,000 ≤ \$50,000	1.155	0.920	1.450	1.194	0.927	1.538	1.053	0.811	1.369
Income Missing	1.120	0.838	1.496	1.140	0.833	1.559	1.273	0.945	1.715
<i>Parental Education</i>									
Less than High School	0.938	0.720	1.222	1.007	0.707	1.433	0.847	0.597	1.202
Some College/Tech School	0.691 ^{***}	0.570	0.838	0.854	0.658	1.117	0.871	0.655	1.157
College Degree	0.667 ^{***}	0.549	0.811	0.767 [*]	0.571	0.986	0.838	0.637	1.103
Graduate Degree	0.564 ^{***}	0.422	0.753	0.643 [*]	0.458	0.903	1.102	0.826	1.471
Education Missing	0.812	0.539	1.224	1.595	0.939	2.710	0.473	0.225	0.992

Weighted data.

F (78, 51) = 21.57, p<.001

a. Reference trajectory group is *low desister*.

b. Demographic characteristic reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05

Table 4.2 Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 Social Relationships and Demographic Characteristics (n=3,642)

<i>Independent Variables^b</i>	Chronic Perpetrator^a		
	<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>			
Attachment to Parent (1-5)	1.056	0.894	1.247
Child Abuse Victimization (0-12)	1.027	0.995	1.060
Friends Care (1-5)	1.074	0.930	3.790
Contact with Friends (0-3)	1.016	0.926	1.240
Delinquent Friends (0-3)	0.914	0.832	1.116
Romantic Partnership (0=no/1=yes)	0.943	0.745	1.005
<i>Risk Factors</i>			
Drink Alcohol (0=no/1=yes)	1.037	0.970	1.108
Smoke (0=no/1=yes)	0.958	0.736	1.249
Violence Victimization (0=no/1=yes)	0.938	0.772	1.140
<i>Demographic Characteristics</i>			
<i>Gender</i>			
Male ^a	1.527 ^{***}	1.217	1.915
<i>Race/Ethnicity</i>			
Black/ African American	1.149	0.874	1.511
Hispanic/Latino	0.872	0.629	1.208
Other	1.274	0.693	2.342
Asian American/Asian	0.591 [*]	0.359	0.973
<i>Family Structure</i>			
Parent and Step-parent	1.339	1.055	1.700
Single Mother or Single Father	1.200	0.962	1.497
Other Family Structure	1.283	0.783	2.102
<i>Household Income</i>			
≤ \$25,000	1.105	0.793	1.539
> \$25,000 ≤ \$50,000	1.034	0.765	1.397
Income Missing	1.018	0.732	1.414

Continues

Table 4.2 Continued

<i>Independent Variables^b</i>	Chronic Perpetrator^a		
	<i>RRR</i>	<i>95% CI</i>	
<i>Parental Education</i>			
Less than High School	1.073	0.771	1.494
Some College/Tech School	1.241	0.962	1.602
College Degree	1.150	0.891	1.484
Graduate Degree	1.141	0.779	1.670
Education Missing	1.964 ^{**}	1.234	3.126

Weighted data.

F (78, 51) = 21.57, p<.001

a. Reference trajectory group is *low desister*.

b. Demographic characteristic reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05

Table 4.3 Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 and Wave 3 Social Relationships and Demographic Characteristics (n=3,642)

<i>Independent Variables^b</i>	Chronic Perpetrator^a (n=1,282)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>			
Attachment to Mother/Father (1-5)	1.017	0.852	1.214
Child Abuse Victimization (0-12)	1.020	0.987	1.057
Friends Care (1-5)	1.064	0.920	1.229
Contact with Friends (0-3)	0.992	0.901	1.092
Delinquent Friends (0-3)	0.909*	0.829	0.997
Romantic Partnership (0=no/1=yes)	0.976	0.769	1.235
<i>Relationships Wave 3</i>			
Attachment to Mother/Father (1-5)	1.025	0.871	1.207
Married (0=no/1=yes)	0.618**	0.460	0.831
Cohabiting (0=no/1=yes)	1.038	0.782	1.378
Other Relationship (0=no/1=yes)	1.067	0.831	1.370
Contact with Friends (0-7)	1.018	0.979	1.058
<i>Risk Factors Wave 1</i>			
Drink Alcohol (0=no/1=yes)	1.029	0.961	1.101
Smoke (0=no/1=yes)	0.899	0.685	1.170
Violence Victimization (0=no/1=yes)	1.058	0.857	1.305
<i>Risk Factors Wave 3</i>			
Risk Taking (1-5)	1.150**	1.042	1.271
Drink Alcohol (0=no/1=yes)	1.124	0.952	1.428
Smoke (0=no/1=yes)	1.169	0.900	1.404
Violence Victimization (0=no/1=yes)	1.636**	1.130	2.354
<i>Demographic Characteristics</i>			
<i>Gender</i>			
Male	1.301*	1.058	1.699
<i>Race/Ethnicity</i>			
Black/African American	1.150	0.859	1.541
Hispanic/Latino	0.906	0.655	1.254
Other	1.247	0.678	2.294
Asian American	0.603	0.354	1.206
<i>Family Structure</i>			
Parent and Step-parent	1.284	0.999	1.651
Single Mother or Single Father	1.154	0.917	1.452
Other Family Structure	1.359	0.828	2.229

Continues

Table 4.3 Continued

<i>Independent Variables^b</i>	Chronic Perpetrator^a (n=1,282)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Household Income</i>			
≤ \$25,000	1.161	0.823	1.639
> \$25,000 ≤ \$50,000	1.069	0.785	1.457
Income Missing	1.050	0.748	1.473
<i>Parental Education</i>			
Less than High School	1.148	0.817	1.611
Some College/Tech School	1.259	0.975	1.625
College Degree	1.120	0.864	1.453
Graduate Degree	1.068	0.720	1.583
Education Missing	2.022 ^{**}	1.260	3.244

Weighted data.

F (105, 24) = 21.38, p<.001

a. Reference trajectory group is *high desister*.

b. Demographic characteristics reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05.

Table 4.4 Percent Distribution or Mean (Standard Deviation) of Wave 3 and Wave 4 Social Relationships and Risk Factors for Each Violence Trajectory Group (n=11,197)

<i>Variables</i>	I. Low Desister (n = 6,712)	II. High Desister (n = 2,360)	III. Chronic Perpetrator (n = 1,282)	IV. Late Escalator (n = 843)	Total (n=11,197)
<i>Relationships Wave 3</i>					
Attachment to Parent (1-5)	4.630 (0.526)	4.509 (0.656)	4.497 (0.670)	4.606 (0.584)	4.588 (0.580)
Relationship Status					
No relationship	35.7	31.9	35.2	31.3	34.5
Married	16.4	20.5	12.1	20.0	17.0
Cohabiting	15.3	20.8	22.8	18.6	17.6
Other Relationship	32.6	26.9	29.9	30.1	30.9
Contact with Friends (0-7)	4.389 (2.343)	4.340 (2.423)	4.581 (2.417)	4.366 (2.462)	4.399 (2.378)
<i>Risk Factors Wave 3</i>					
Risk Taking (1-5)	3.310 (0.982)	3.570 (0.992)	3.771 (1.028)	3.452 (1.088)	3.429 (1.073)
Drink Alcohol (0=no/1=yes)					
Yes	44.4	48.2	54.1	46.4	46.5
Smoke (0=no/1=yes)					
Yes	37.7	53.5	56.7	39.3	43.4
Violence Victimization (0=no/1=yes)					
Yes	3.2	7.6	13.6	4.4	5.5
<i>Relationships Wave 4</i>					
Attachment to Parent (1-5)	4.135 (0.821)	4.016 (0.847)	4.013 (0.853)	4.097 (0.893)	4.093 (0.837)
Relationship Status					
No relationship	20.5	21.9	22.0	23.1	21.1
Married	43.0	39.5	30.1	44.1	40.8
Cohabiting	17.7	21.0	23.4	15.4	18.9
Other Relationship	18.9	17.7	24.6	17.4	19.2
Close Friends (0-7)	3.177 (1.002)	3.029 (1.084)	3.072 (1.105)	3.205 (1.075)	3.135 (1.040)

Continues

Table 4.4 Continued

<i>Variables</i>	I. Low Desister (n = 6,712)	II. High Desister (n = 2,360)	III. Chronic Perpetrator (n = 1,282)	IV. Late Escalator (n = 843)	Total (n=11,197)
<i>Risk Factors Wave 4</i>					
Risk Taking (1-5)	2.878 (0.982)	3.117 (0.992)	3.332 (1.024)	3.029 (1.089)	2.992 (0.017)
Drink Alcohol (0=no/1=yes)					
Yes	48.1	47.6	52.6	44.7	48.2
Smoke (0=no/1=yes)					
Yes	31.9	47.0	54.9	35.4	38.0
Violence Victimization(0=no/1=yes)					
Yes	8.5	14.0	61.3	83.1	21.1

Weighted data.

Table 4.5 Parameter Estimates (Standard Errors) of Time Varying Effect of Parental Closeness at Waves 1-4 on Violence Trajectories (n=11,197)

Trajectories	Parameter Estimates ^a			
	β_0	β_1	β_2	α_1
Low Desister	4.619 ^{***} (0.472)	-3.541 ^{***} (0.247)	b	-0.196 ^{***} (0.058)
High Desister	-6.759 ^{***} (1.068)	9.702 ^{**} (1.247)	-3.285 ^{***} (0.370)	-0.011 (0.033)
Chronic Perpetrator	0.372 [*] (0.149)	b	b	-0.061 [*] (0.031)
Late Escalator	-7.131 ^{***} (0.823)	2.512 ^{***} (0.276)	b	-0.021 (0.051)

Notes: Weighted data.
BIC= -44327.24

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}$

where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}}$.

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

Table 4.6 Parameter Estimates (Standard Errors) of Time Varying Effect of Romantic Partnership at Waves 1-4 on Violence Trajectories (n=11,197)

Trajectories	Parameter Estimates ^a			
	β_0	β_1	β_2	α_1
Low Desister	3.820 ^{***} (0.355)	-3.729 ^{***} (0.264)	b	0.353 ^{***} (0.091)
High Desister	-6.529 ^{***} (1.028)	9.257 ^{***} (1.239)	-3.173 ^{***} (0.366)	0.201 ^{***} (0.051)
Chronic Perpetrator	0.021 (0.057)	b	b	0.108 [*] (0.053)
Late Escalator	-7.234 ^{***} (0.761)	2.527 ^{***} (0.262)	b	-0.055 (0.090)

Notes: Weighted data.
BIC= -44421.47

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2 + \alpha_1^j Romantic_{it}$

where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j Age_{it} + \beta_2^j Age_{it}^2 + \alpha_1^j Romantic_{it}}$

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

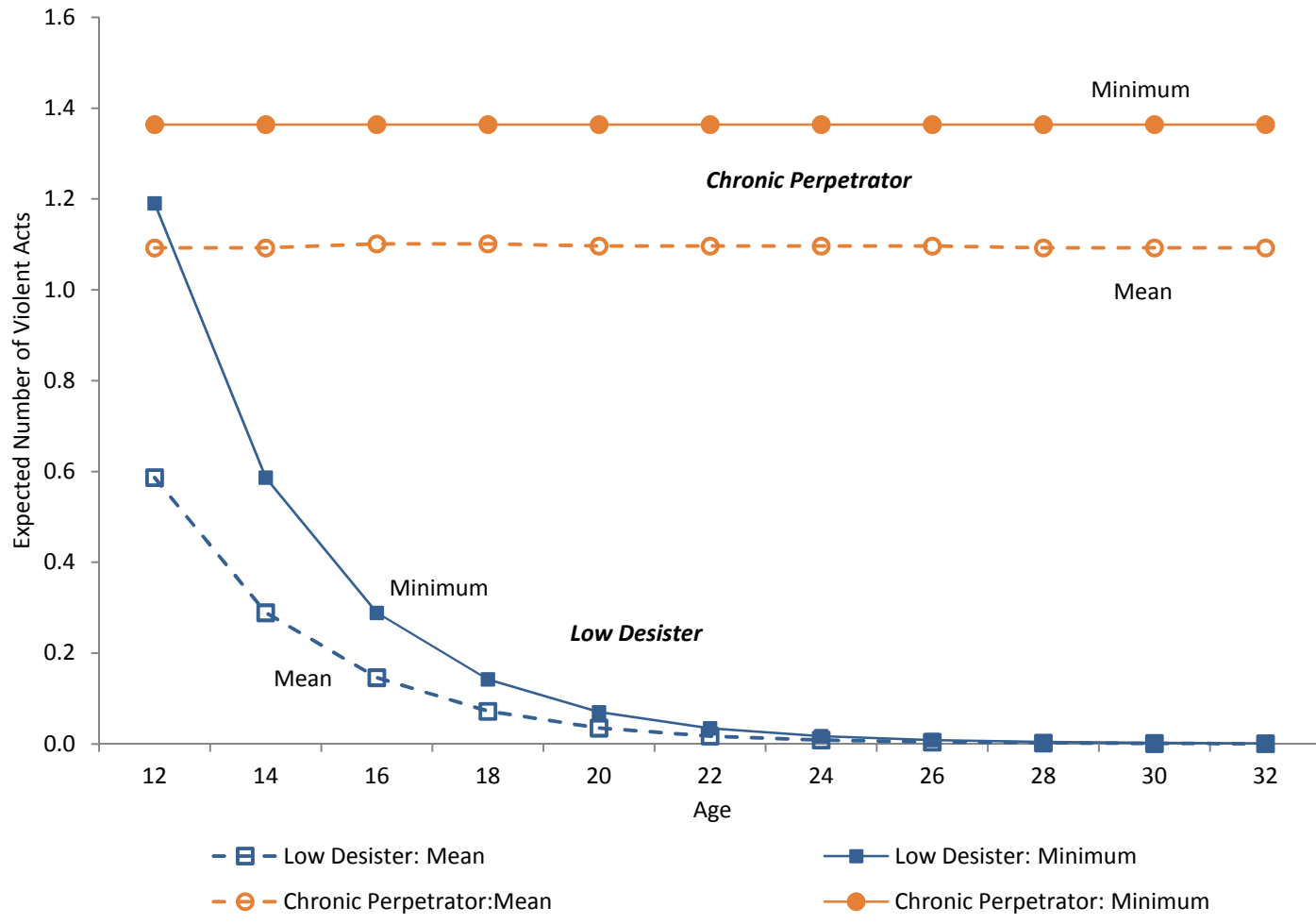


Figure 4.1 Effect of Mean versus Average Levels of Parental Closeness on Violence Trajectories from Adolescence to Adulthood (Waves 1-4)

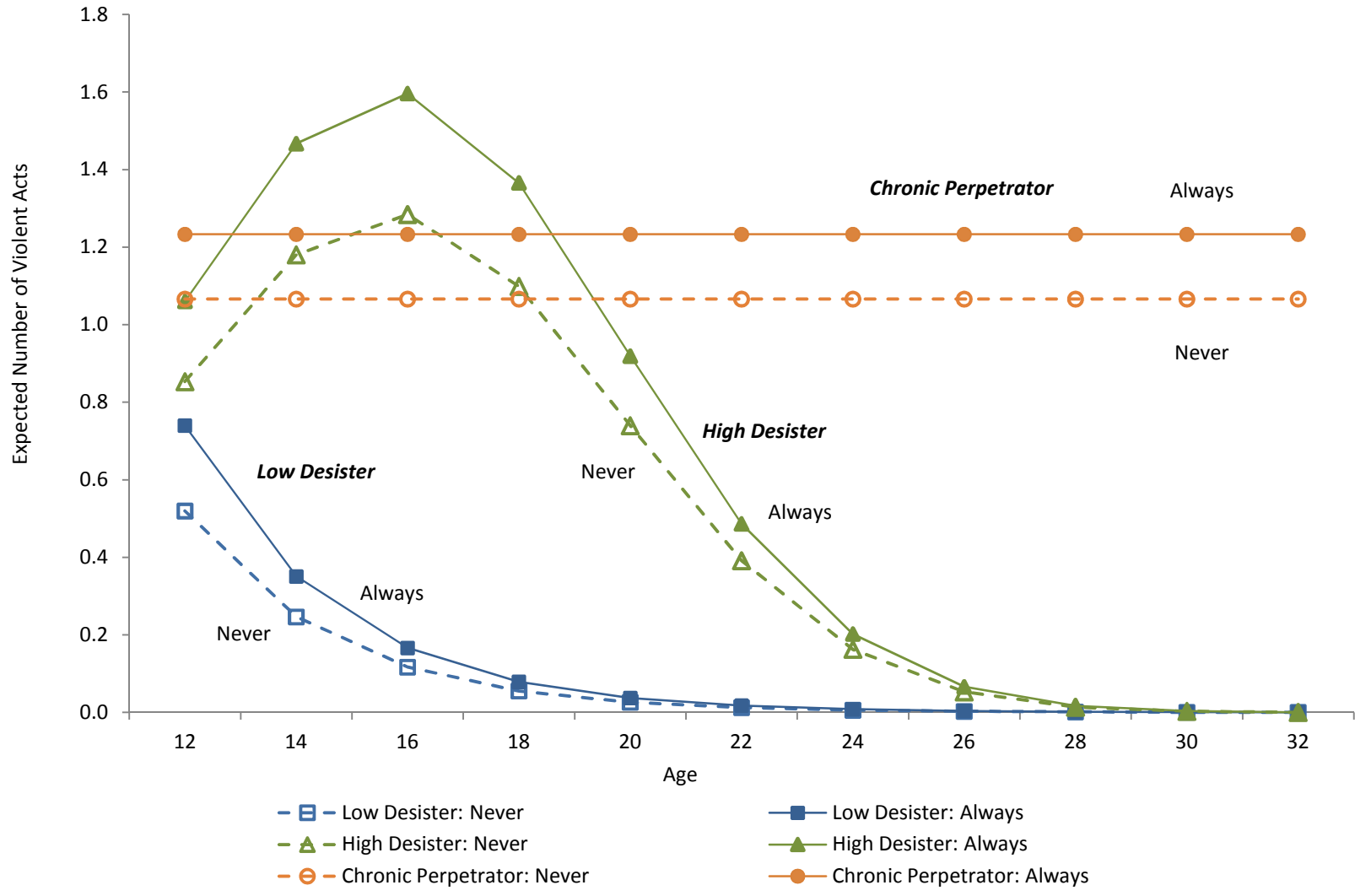


Figure 4.2 Effect of Always versus Never having a Romantic Partner from Early to Middle Adolescence through Adulthood (Waves 1-4) on Violence Trajectories

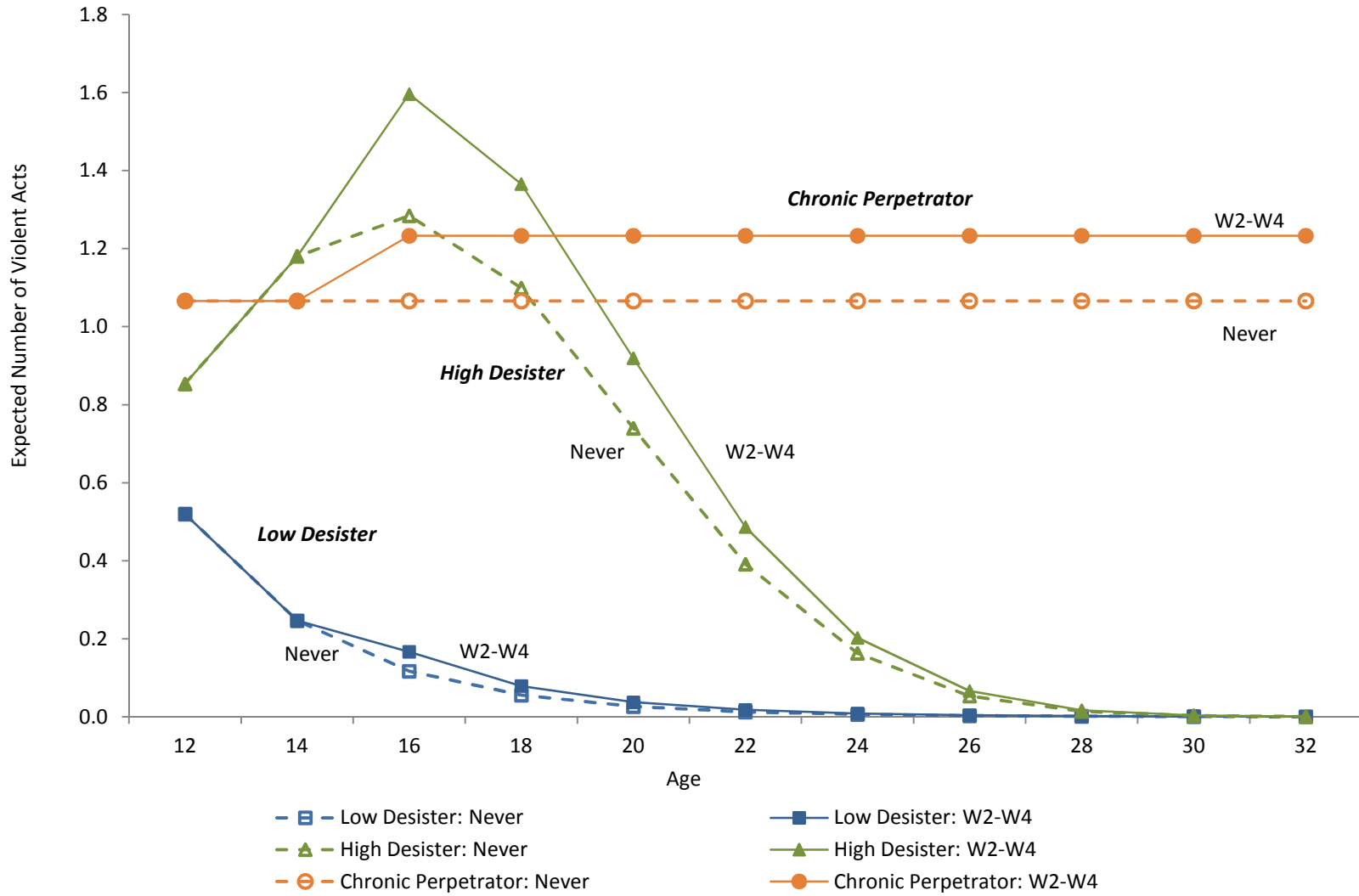


Figure 4.3 Effect of having a Romantic Partner from Middle to Late Adolescence through Adulthood (Waves 2-4) on Violence Trajectories

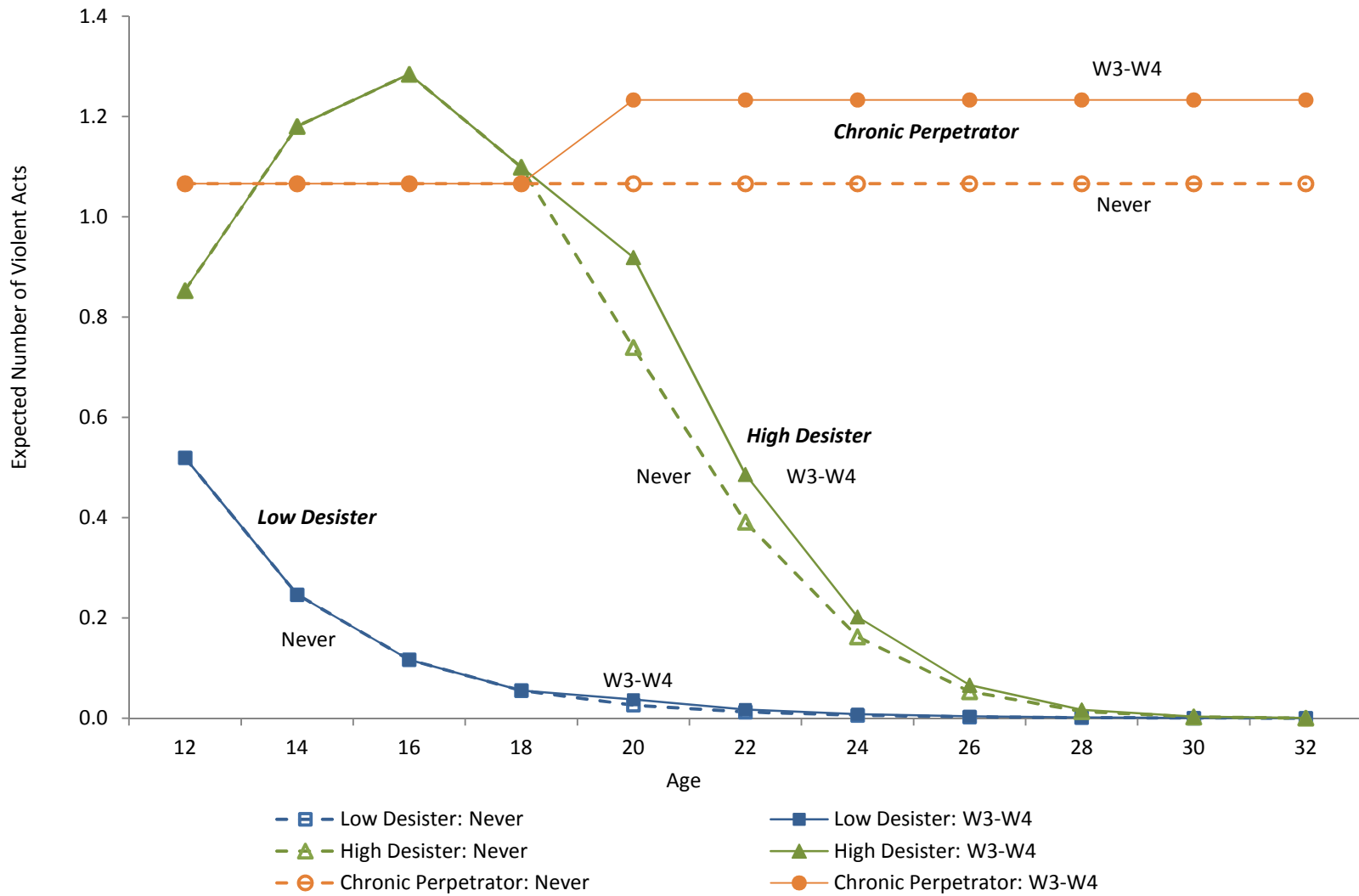


Figure 4.4 Effect of Having a Romantic Partner from Early Adulthood through Adulthood (Waves 3-4) on Violence Trajectories

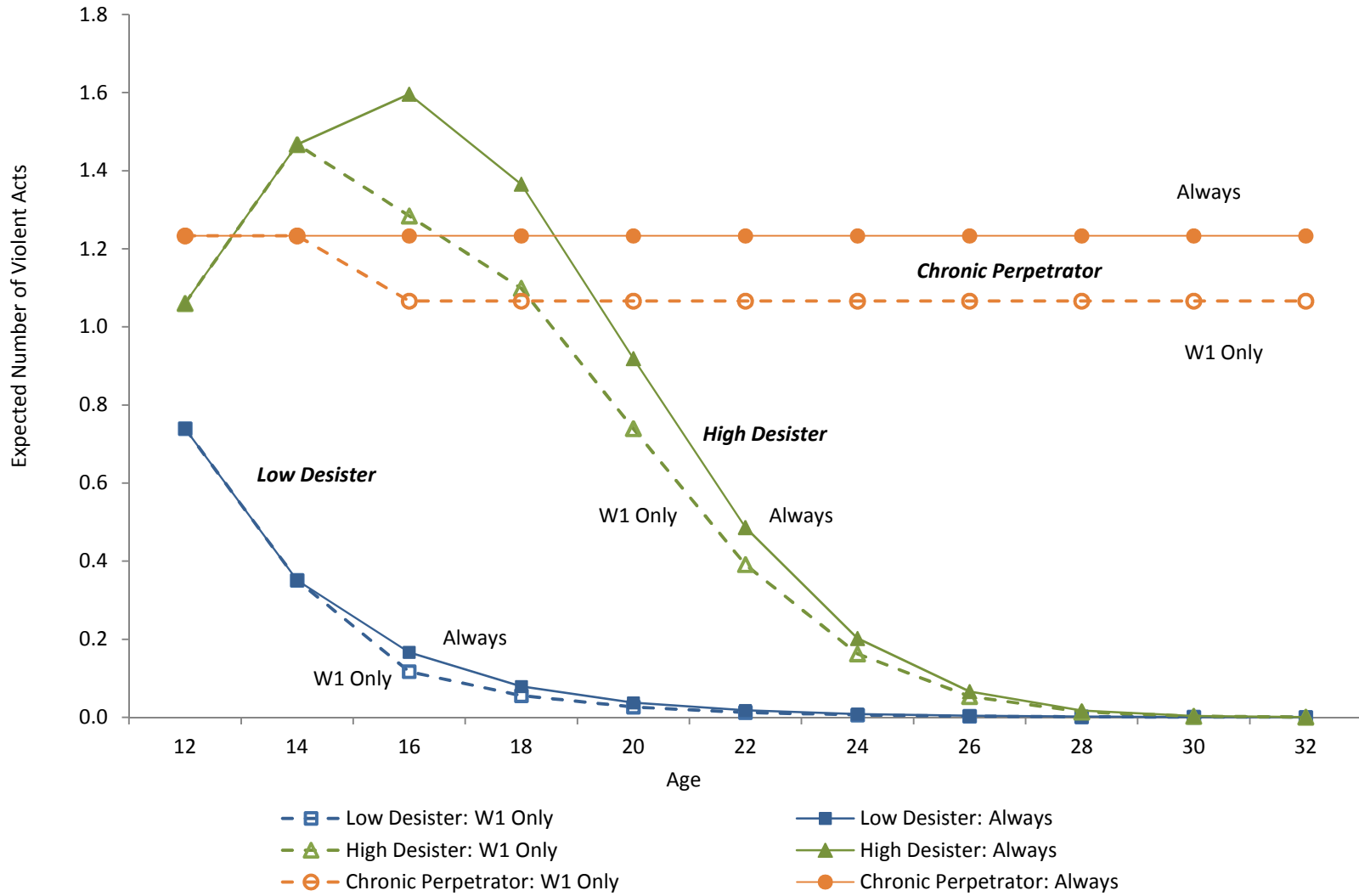


Figure 4.5 Effect of Exiting a Romantic Partnership in Middle to Late Adolescence (Waves 2-4) on Violence Trajectories

CHAPTER 5: RESULTS

SOCIAL RELATIONSHIPS AND VIOLENCE TRAJECTORIES: FEMALES AND MALES

This chapter examines the extent to which females and males are similar and different in the ways that social relationships influence violent behaviors from adolescence through adulthood to address Specific Aim 3. As in Chapter 4, this chapter elucidates the degree to which adolescent and early adulthood relationships shape the course of the initiation, persistence, and cessation of violent behaviors over time. It first considers relationships from adolescence and then those from early adulthood by gender. This chapter also describes the extent to which stability and change in social relationships impact female and male trajectories of violence. Because the trajectories are not entirely identical across genders, this chapter provides a largely qualitative comparison.

The violence trajectories identified in Chapter 3 for females and males are the categorical outcome variables for the analyses in this chapter. They are: *low desister* (reference), *high desister*, *chronic perpetrator*, and *late escalator* trajectories. Although the labels are the same, they differ by gender in terms of their specific equations and compositions (see Tables 3.4, 3.7, and Figures 3.2 and 3.3). The female *low* and *high desister* groups enact less violence than the comparable male groups, which desist later than their female counterparts. The male *chronic perpetrator* group has consistently high levels of violence, but the female group follows a u-shaped curve, first declining and then increasing their violent activity starting when they are in their 20's. The shape of the *late escalator* groups in males and

females are similar, with the female group following a steeper increasing curve than the male group.

The largest groups for both males and females are the *low desister* and *high desister* groups. The *low desister* group is about two-thirds of female subsample and half of the male subsample. The *high desister* groups are about one fifth of females and one quarter of males. The *late escalator* group is the smallest group among males, whereas the *chronic perpetrator* group is the smallest among females.

5.1 WAVE 1 SOCIAL RELATIONSHIPS AND VIOLENCE TRAJECTORIES BY GENDER

The effect of social relationships and Wave 1 demographic characteristics on the relative risk of being in the three trajectory groups compared to the *low desister* group among females is presented in Table 5.1a. The results of this analysis among males are provided in Table 5.1b. A gender stratified multinomial logistic regression with the *low desister* group as the comparison group was conducted. This group was chosen as the reference group because it is the largest group and also has the least overall involvement in violence compared to the other three groups. As shown in Table 5.1ab we can reject the null hypothesis that all of the coefficients in both models equal 0 at $p < .001$.

As can be seen in Table 5.1a for females, the probability of belonging to these groups significantly differs in terms of race/ethnicity, family structure, and parental education. Adjusting for the other variables in the model, race/ethnicity is the sole demographic characteristic that distinguishes all three trajectory groups from the *low desister* group. Non-

Hispanic White females are generally less likely than others to be in the more violent groups. Black and Hispanic females are more likely to be in the *high desister* and *chronic perpetrator* groups than non-Hispanic White females. Black females also have an increased risk of being in the *late escalator* group and race-ethnicity is the only demographic characteristic that differentiates membership in this group from the reference group. Asian American females also have a greater risk than non-Hispanic White females of being in the *high desister* group. Family structure has a limited role in differentiating group membership among females although parental education has an inverse relationship with membership in the *high desister* and *chronic perpetrator* groups.

Net all the other variables in the model, all the demographic characteristics differentiate group membership for males, as shown in Table 5.1b. However, unlike the females, none of the demographic characteristics are predictors of membership across all of the three groups. All the demographic characteristics are associated with being in the *chronic perpetrator* group among males. Non-Hispanic White males are less likely than racial/ethnic minorities to be in the *chronic perpetrator* and *late escalator* groups compared to the *low desister* group. The exception is Asian American males who, compared to non-Hispanic White males, are more likely to be in the *low desister* than *chronic perpetrator* group. Family structure has a only small role in predicting group membership among males. Parental education and household income have an inverse relationship with group membership.

Net of the demographic controls, the independent variables for this analysis are relationships with parents, friends, and romantic partners in adolescence, i.e., Wave 1. The same measures of social relationships and risk factors examined for the full sample were used

in this analysis (see Chapter 4, Section 4.1 for scoring). The measures for parental relationships are parental attachment and the frequency of child abuse. The operationalization of relationships with friends in adolescence includes: (1) the frequency of contact with friends in a week, (2) the number of close friends that smoked cigarettes, drank alcohol, and/or smoked marijuana at Wave 1, and (3) the extent that a person perceived friends cared for her/him. The measure for romantic partnership was limited to one question that asked whether the respondent is in a romantic relationship. The risk factors from adolescence included in this model are: drinking on a regular basis, smoking on a regular basis, and violence victimization.

5.1.1 Membership in the High Desister Group Relative to the Low Desister Group by Gender

At issue is the extent to which social relationships in adolescence explain why some males and females exhibit minimal levels of violence and desist while others exhibit higher levels of violence at baseline and increase their violent activities before they desist. The relative risk ratios for belonging in the *high desister* group relative to the *low desister* group is presented in Column I of Table 5.1a for females and Table 5.1b for males. Throughout this section, risk of membership in the *high desister* group is always relative to the *low desister* group.

Social Relationships. For females, all of the relationship variables, with the exception of friends care, significantly distinguish group membership in the *high desister* group from the *low desister* groups. All but one of the relationship variables that are significant among females are also significant among males; the exception is contact with friends. Parental attachment is the sole variable that decreases the risk of membership in the female *high desister* group. That is,

females with higher values on the parental attachment scale are less likely to be in the *high desister* group; the magnitude of this relationship is moderate, such that a 1-unit increase on the scale decreases the risk by a factor of 0.762. When comparing the two extremes on the scale, “not at all attached” to “very attached”, this risk decreases by a factor of 0.337 (0.762^4). Parental attachment is also significant among males, but operates in the opposite direction, such that males with higher values are *more* likely to be in the *high desister* than *low desister* group.

A history of child abuse increases the risk of membership in the *high desister* group for both males and females. A female who has been abused on a single occasion has a risk that is 1.110 times that of someone who has never been abused, but being abused 12 times (the maximum on the scale) increases risk by 3.138 times. Using the same comparisons among males, the values are 1.090 times and 2.812 times, respectively.

Number of delinquent adolescent friends significantly differentiates group membership among females and males. Female who have one versus no delinquent friends are 1.317 times more likely to be in the *high* than *low desister* group; for three delinquent friends (the maximum on this scale), the value is 2.284 times. The comparable values for males are 1.342 times for the former and 2.417 times for the latter. This indicates that the more delinquent friends the more likely that both females and males will be in the *high* than *low desister* group. In addition, having a romantic partner in adolescence increases the risk of membership in the *high desister* group relative to the *low desister* group by 10% for females, and by 44% for males.

The frequency of contact with friends is significant among females but not males, but the effect is small such that a female who had contact with her friends once in a week is 1.218

times more likely than one who had no contacts with her friends to be in the in the *high desister* than *low desister* group.

Risk Factors. Only two of the three risk factors significantly increase the probability of being in the *high desister* group among females and males. Violence victimization has a very strong association with group membership in both gender subsamples in that being victimized increases the risk being in the *high desister* group by over 300%. Although smoking is associated with increased risk of membership in the *high desister* group among females, it is not significant among males. However, drinking is associated with an increased risk of being in the *high desister* group among males but not females.

5.1.2 Membership in the Chronic Perpetrator Group Relative to the Low Desister Group by Gender

This section describes the risk of being in the *chronic perpetrator* group compared to the *low desister* group, as shown in Column II of Table 5.1a for females and Table 5.1b for males. The *chronic perpetrator* group is the smallest group among females and the next to smallest group among males. As was shown in Figure 3.3, the male *chronic perpetrator* group is persistently high on violence levels. In contrast, although the females in the *chronic perpetrator* are continuously violent, they start with high levels of violence and decline their levels of violent behavior before increasing it, as was shown in Figure 3.2. In this section, the risk of being in the *chronic perpetrator* group is understood to be relative to the *low desister* group.

Social Relationships. Three of the six Wave 1 social relationships in this analysis are statistically significant among females and four are significant among males. The two social relationship measures that distinguish group membership in both females and males are child

abuse and delinquent friends. Females and males who have been harmed by their parents frequently are more likely to be in the *chronic perpetrator* group than the *low desister* group. For a female who experienced 12 occurrences of child abuse, this risk is increased by 166%; for males the figure is 392%. Having a single versus no delinquent friends increases the risk of membership in the *chronic perpetrator* group by a factor of 1.208 for females and 1.225 for males. This risk increases to 1.763 and 1.838, respectively, for three delinquent friends, for females and males, respectively.

The two measures that distinguish group membership among males, but not females, are the frequency of contact with friends and the presence of a romantic partner. When compared to a male who did not have contact with his friend(s) in the past week, a male who did so once is 1.167 times more likely to be in the *chronic perpetrator* group; this risk increases to 1.589 for contact 5 or more times a week. Males in romantic partnerships are more likely to be in the chronic perpetrator group by a factor of 1.302 relative to males who are not in a relationship.

Parental attachment is the sole social relationship that significantly differentiates group membership among females, but not males, and the only social relationship that *decreases* membership in the *chronic perpetrator* group. This effect is moderate in that a 1-unit increase on the scale decreases this risk by a factor of 0.798, but comparing the minimum to the maximum values on the scale (i.e., 5 versus 1) decreases this risk by a factor of 0.324.

Risk Factors. All of the three risk factors increase the probability of membership in the *chronic perpetrator* for females and only two are significant among males. The magnitude of violence victimization is very large for both females and males. A female who has been a victim

is more likely to be in the chronic perpetrator by 357.1%; the figure for males is 276.0%.

Drinking regularly during adolescence has a small effect and smoking regularly has a moderate effect in differentiating group membership among females. Drinking alcohol regularly increases the risk of membership in the *chronic perpetrator* males, but smoking does not.

5.1.3 Membership in the Late Escalator Group Relative to the Low Desister Group by Gender

The relative risk ratios for being in the *late escalator* group compared to the *low desister* group are presented in Column III of Table 5.1ab. Females in the *late escalator* group enact fewer violent behaviors than the *low desister* group during adolescence. It is not until early adulthood that this group has noteworthy increases in violence. The same pattern is found among males. The *late escalator* group is the smallest group identified in the male subsample and the third smallest group in the female subsample. This analysis examines the extent to which the adolescent social relationships of males and females explain why people who are not violent become violent over time compared to people who are minimally violent and then desist. Reference to the risk of being in the *late escalator* group is always relative to the *low desister* group in the following sections. As shown in Table 5.1b, race/ethnicity is the only significant predictor for group membership in the *late escalator* group for males. Thus, this section focuses on the results for the females.

Social Relationships. As seen in Table 5.1a only two social relationships significantly differentiate membership in the *late escalator*, adjusting for other variables in the model: number of times the female was abused as a child by a parent and the number of delinquent friends in adolescence. The magnitude of the child abuse variable effect is small when

considering differences between each specific instance, for example, a female who was abused once versus never is 1.068 more likely to be in the group that escalates in violence in adulthood, but 12 instances of abuse more than doubles the risk. A female who has one versus no delinquent friends has an increased risk 1.176 times of being in the *late escalator* group; this risk increases to a factor of 1.626 for three versus no delinquent friends.

Risk Factors. All three risk factors with the exception of victimization during adolescence are significant predictors of group membership, net of the other variables in the model. A female who drinks regularly during adolescence has an increased risk of being in the *low desister* group than the *late escalator* group compared to a female who does not. In contrast, a female who smokes in adolescence has an increased risk of being in the *late escalator* group than the *low desister* one, compared to a female who does not smoke. The magnitude of both these variables are small. Contrary to the *high desister* and *chronic perpetrator* groups, violence victimization was not significant.

5.1.4 Membership in the Chronic Perpetrator Group Relative to the High Desister Group by Gender

In the multinomial logistic regression just described the risk of being in each group was relative to being in the *low desister* group. As for the full sample, the probability of being in the *chronic perpetrator* compared to the *high desister* group, however, is a valuable comparison of interest. This is because both of these groups enact high levels of violence in adolescence and their initial trajectories are within close range of each other until their paths diverge in early adulthood: the *chronic perpetrator* group continues its involvement in violence whereas the *high desister* group ceases to be violent. Thus, the multinomial logistic regression model with

the *high desister* group as the reference was re-estimated for both males and females. Only the coefficients for the risk of being in the *chronic perpetrator* group are reported in Table 5.2a and Table 5.2b and interpreted to avoid unnecessary multiple tests of statistical significance.

Only demographic characteristics are predictors of membership in the *chronic perpetrator versus high desister* group among females. Demographic characteristics and child abuse differentiate membership among males. For males, each additional act of abuse increases this risk by a factor of 1.047. Comparing the extremes, that is 12 versus 0 times, this risk increases by 1.735 times. Males from step-parent and single parent families are more likely than those from two biological parent families to be in the *chronic perpetrator* than *high desister* group. The magnitude, however, is small. Among females all the demographic characteristics, but household income are significant. Black females are more likely than non-Hispanic White females, all else equal, to be in the *chronic perpetrator* group by a factor of 1.644. Females from single parent households have decreased risk of being in the group that persistently commits acts of violence versus the group that desists. Missing on education is also statistically significant.

5.2 WAVE 3 SOCIAL RELATIONSHIPS: CHRONIC PERPETRATOR GROUP VERSUS HIGH DESISTER GROUP BY GENDER

This section evaluates the extent to which the social relationships of females and males in early adulthood affect trajectories of violent behaviors set during adolescence. This analysis is different from the previous analysis in that it includes Wave 3 social relationships in addition to the ones described above. Specifically, Wave 3 social relationships are examined to assess

the degree to which they differentiate membership in the *chronic perpetrator* group relative to the *high desister* group. These same groups were examined in the last step of the previous analysis. As described above, the *chronic perpetrator* and *high desister* groups have similar involvement in violence in adolescence but diverge as people enter early adulthood, with the former remaining engaged in violence and the latter retreating from it.

As described in the previous chapter (see Chapter 4, Section 4.2), only these two groups are appropriate for comparison because this is the lone pair of groups for which Wave 3 social relationships are concurrent with changes in behaviors that make these groups diverge. The other groups have varying levels of violence in adolescence and follow different paths before and after Wave 3 and thus, are not comparable based on Wave 3 variables. A multinomial logistic regression based on the four groups with the *high desister* group as the reference group was estimated separately for males and females to maintain comparability with previous analyses. Again, only the coefficients for the risk of being in the *chronic perpetrator* group relative to the *high desister* group are presented in Tables 5.3a for females and 5.3b for males.

The same Wave 1 and Wave 3 social relationships and risk factors explored in the full sample were examined in this analysis (see Chapter 4, Section 4.2). Wave 1 social relationships were just presented in the above section (Section 5.1). Wave 3 social measures also include parental attachment, violence victimization, drinking regularly, and smoking regularly. Although the Wave 1 romantic partnership measure was based on whether or not a person was in a romantic relationship, Wave 3 romantic partnership has several categories of relationships status. Risk factors additionally include a question that measures the extent to which a person enjoys taking risks.

Social Relationships. As shown in Table 5.3a, the risk of being in the *chronic perpetrator* group (relative to the *high desister* group) is significantly associated with only risk factors in early adolescence and demographic characteristics among females, and not social relationships. However, among males, social relationships with parents and romantic partners are statistically significant. Although parental attachment during adolescence was not a significant predictor of being in the *chronic perpetrator* group among males when only Wave 1 measures were examined, it is a statistically significant with Wave 3 measures in the model, as can be seen in Table 5.3b: males with securely attached relationships with parents are less likely to be in the *chronic perpetrator* group, such that comparing the minimum (1) and maximum (5) on the scale decreases this risk by a factor of 0.290. Romantic relationship status also differentiates group membership in males. Specifically males who are married in early adulthood versus those who are not in a relationship are less likely to be in the *chronic perpetrator* than *high desister* group by 52.3%. Child abuse by a parent, in contrast, increases this risk by a small amount. Frequent abuse (12 times) relative to no abuse, which are the extreme values on this measure, increases this risk 1.755 time.

Risk factors. Two risk factors from early adulthood distinguish membership in these groups in females, whereas only one does so in males. A predilection for taking risks increases the probability membership in the *chronic perpetrator* than the *high desister* group for males and females. When comparing people at opposite ends of this question, i.e., someone who “very much” likes to take risks versus “not at all”, the risk is 1.811 times greater for females and 2.060 times greater for males. Violence victimization is statistically significant only for females and increases the risk of membership in the group that persists versus desists in violence.

Adjusting for other variables, all sociodemographic characteristics with the exception of household income significantly differentiate group membership in females; none of them do in males. Black females have increased risk of being in the *chronic perpetrator* group than the *high desister* group compared to non-Hispanic White females. Females from single parent families are less likely than females from families with two biological parents to be in the *chronic perpetrator* group. Females who are missing on parental education levels are more likely to be in the *chronic perpetrator* group relative to the *high desister* group compared to females whose parents have graduated from high school.

5.3 COMPOSITION OF VIOLENCE TRAJECTORY GROUPS IN EARLY ADULTHOOD AND ADULTHOOD BY GENDER

This section describes the composition of the four groups with regard to their Wave 3 and Wave 4 social relationships and risk factors first among females, and then among males. This analysis is entirely descriptive and no tests of statistical significance are performed because Wave 3 and Wave 4 variables cannot be used to determine membership in these groups because of issues of timing. Instead, the group compositions based on Wave 3 and Wave 4 social relationships is compared to the total distribution of these variables in their respective gender subsamples, which acts as a yardstick for what is average or typical to evaluate the composition of any of the groups. The distribution of Wave 3 and Wave 4 social relationships and risk factors are presented in Table 5.4a for females and Table 5.4b for males.

5.3.1 Characteristics of the Female Subsample at Wave 3 and Wave 4

As shown in the last column of Table 5.4a, on average, the female sample reported a securely attached relationship with their parents at young adulthood. This average level of parental attachment is lower at Wave 4, but overall reflects an attached relationship. About one-third of females were not in a relationship at Wave 3 and another third were in some “other” relationship (i.e., in a relationship, but not cohabitating or married); both of these relationship types are less common at Wave 4. Although only 20% of females were married at Wave 3, this percentage had more than doubled at Wave 4. The percentage of females who were cohabitating, about 20%, was consistent at Waves 3 and 4. On average, the females in this study had contact with their friends about 4 days a week in early adulthood. They also had about 3 close friends in adulthood.

On average, females in the sample had equally mixed positive and negative scores on the risk-taking question in early adulthood and adulthood. Less than 4 in 10 females drank alcohol in Waves 3 and 4. Although 40% of females smoked in early adulthood, this percentage decreased by 7% in adulthood. A very small percentage of females were victims of violence for the first time in Wave 3. However, at Wave 4, 20% of the females who had never reported a prior occurrence of violence victimization had been victimized.

5.3.1a Characteristics of the Female Low Desister Group at Wave 3 and Wave 4

To summarize briefly, this group is the largest one identified among females (64%). Column 1 of Table 5.4a presents the composition of the female *low desister* group. Overall, the distributions of the Wave 3 and Wave 4 social relationship and risk factor variables are

reflective of the distributions for the female subsample. This is primarily because it is the largest group. Therefore only the more pronounced differences are given here. The proportion of each of the romantic partnership categories at Wave 3 is similar to females at large with slightly smaller percentage of cohabitating with their partner. However, at Wave 4, the distribution of the romantic categories for females in the *low desister* group mirror that of the females overall.

A smaller percentage of this group smoked than the female subsample, especially at Wave 4. The prevalence of new violence victimization is marginally less than females overall at Wave 3, however, at Wave 4, the prevalence of victimization was only about one third that of the females overall, by far the most noteworthy comparison.

5.3.1b Characteristics of the Female High Desister Group at Wave 3 and Wave 4

The *high desister* group comprises 18% of the female subsample and enacts relatively high levels of violence in adolescence and thereafter desists. This group's composition is presented in Column II of Table 5.4a. In many ways, its characteristics correspond to those of females overall. Focusing attention on differences, we see that this group is much more likely to smoke than females overall at both times. A larger proportion of this group is in romantic relationships at Wave 3 than females overall, with the greatest difference found among those who were cohabitating in early adulthood. These relationship profiles at Wave 4, however, are comparable. Importantly, smaller percentages of this group experienced violence victimization for the first time in early adulthood and adulthood than in the total female subsample.

5.3.1c Characteristics of the Female Chronic Perpetrator Group at Wave 3 and Wave 4

This group is the smallest group and comprises 8% of females. Females in this group continuously perpetrate violence from adolescence to adulthood. The composition of this group is shown in Table 5.4a, Column III and, as can be seen, there are several substantial differences from the total female sample.

Romantic relationship status differs from that of females overall. More of this group was cohabitating in early adulthood and less was in “other” relationships. At Wave 4, however, this group has a smaller percentage of married people. The opposite is true in regards to cohabitating, which is more common in the *chronic perpetrator* group.

Although this group had a higher average score on the risk-taking scale at Waves 3 and 4 than the female subsample, overall they nevertheless had an average score in the neutral ranges in the sense that positive and negative attitudes are offsetting. This group has a high prevalence of people who drank and smoked in early adulthood. Of all the variables considered, the prevalence of violence victimization in this group is 3 times greater than all females at Wave 3 and Wave 4, indicating that these females experienced disproportionately high levels of violence victimization.

5.3.1d Characteristics of the Female Late Escalator Group at Wave 3 and Wave 4

The second to smallest group estimated in the female subsample, 9%, is the *late escalator* group. The people in this group are not violent during adolescence and then start enacting violence at a rapidly increasing rate from early adulthood into adulthood. As can be seen in Column IV of Table 5.4a, the composition of this group is similar to that of the whole

female subsample, except for a key exception described below. The distribution of people across the romantic relationship categories in this group and among females overall is comparable in early adulthood, but varies in adulthood, with a larger percentage being not in a relationship or married, and a smaller percentage in an “other” relationship.

The average scores on the risk-taking scale for the *late escalator* group at Waves 3 and 4 indicate that the females in this group both liked and disliked taking risks, but the averages are higher than for females overall. Although the percentage of females in this group who were first-time victims of violence was only slightly higher than that of the female sample in Wave 3, it was 4 times that in Wave 4, indicating a disproportionate experience with violence victimization in this group in adulthood.

5.3.2 Characteristics of the Male Sample at Wave 3 and Wave 4

As shown in the last column of Table 5.4b, males in the sample, on average reported a securely attached relationship with their parents at young adulthood and adulthood, although to a lesser extent in the latter period. Four in 10 males were not in a relationship in early adulthood and an additional 3 in 10 males were in some “other” relationship (i.e., in a relationship, but not cohabitating or married). Although at Wave 3 these two relationship categories comprised 70% of the male sample, these categories made up less than 50% of it at Wave 4. Only 13% of males were married at Wave 3, but this percentage had nearly tripled at Wave 4. The proportion of males who were cohabitating is similar at Waves 3 and 4. Males had contact with their friends about 4 days a week in early adulthood and had about 3 close friends in adulthood.

The male subsample on average leaned toward a predilection for taking risks in early adulthood and adulthood. In adulthood the high and low scores balance each other to a more neutral average. More than half of the male subsample drank in early adulthood and adulthood. Slightly less than half of males smoked in early adulthood and adulthood. About 7% of males were victims of violence for the first time in Wave 3 and this percentage more than triples in Wave 4.

5.3.2a Characteristics of the Male Low Desister Group at Wave 3 and Wave 4

About 50% of males are assigned to this group based on their highest probability of group membership. It is the largest group and its composition is presented in Column I of Table 5.4b and described here. Overall, the composition of this group is reflective of the male subsample, largely a function in part of this being the largest group. Therefore only differences are noted here.

Although this group did not differ in the percentage of drinkers in early adulthood and adulthood than the male subsample, the percentage of smokers in this group were smaller during both periods by 7-8%. The proportion who experienced violence victimization in Wave 3 is slightly smaller than the males overall, however it is disproportionately smaller in Wave 4. It is one-half of the proportion found in the male subsample.

5.3.2b Characteristics of the Male High Desister Group at Wave 3 and Wave 4

About 25% of males were assigned to the *high desister* group. As described previously, this group has relatively high levels of violence in adolescence and thereafter steadily declines

in early adulthood before it desists. The composition of this group is presented in Column II of Table 5.4b.

The percentages of the four romantic partner categories at Wave 4 are similar to those for the male subsample, however, they somewhat differ at Wave 3. The proportion of people in this group who are not in a relationship or in “other” relationships is lower than the proportion of these types in males overall. In contrast, the proportion of males who were cohabitating or married is higher than in the male subsample. On average, males in this group reported having contact with friends in early adulthood with less frequency and had fewer friends in adulthood than males in general. Although the mean parental attachment score of this group in Waves 3 is slightly smaller than the male subsample, it is visibly smaller in Wave 4.

On average, males in the *high desister* group reported liking to take risks in early adulthood and somewhat more than males in general. However, in adulthood, people in this group have about the same average score as males overall, such that positive and negative scores average to a neutral average about risk-taking in adulthood. Although in adulthood the percentage of drinkers in this group was smaller than in the males as a whole, the percentage of smokers is higher. The distribution of victimization at Wave 3 is slightly more than the subsample at Wave 3, however, the prevalence of males who reported violence victimization in Wave 4 is lower in this group by 10%.

5.3.2c Characteristics of the Male Chronic Perpetrator Group at Wave 3 and Wave 4

This group comprised 15.3% of males and enacts persistently high levels of violence from adolescence to adulthood. As can be seen in Column III of Table 5.4b, the composition of

this group differs from the male subsample in terms of social relationships and risk factors at Wave 3 and Wave 4.

Although the males in this group were less securely attached to their parents in early adulthood than the subsample, this difference was more pronounced in adulthood. The males in this group differ substantially in terms of romantic partnerships in Wave 3 and Wave 4. A lower percentage was married than in the larger subsample by 4% in early adulthood and by 10% in adulthood. At both periods the percentage that was cohabitating was higher in this group by 3%. Moreover, over one quarter of males in this group were in an “other relationship” compared to one-fifth of males in general. On average they had contact out with their friends with greater frequency in early adulthood and reported less close friends in adulthood than the male subsample at large.

Males in this group indicated a greater disposition for taking risks than the subsample in both early adulthood and adulthood. This group has a larger percentage of smokers and drinkers in Wave 3 than males overall. In both early adulthood and adulthood this group has a disproportionately higher percentage of males who reported violence victimization. The proportions were almost two times that of the greater male subsample at Wave 3 and nearly three times at Wave 4.

5.3.2d Characteristics of the Male Late Escalator Group at Wave 3 and Wave 4

The late escalator group comprises 5% of males. This group starts with no violence in adolescence and begins in late adolescence at an accelerating rate. Column IV of Table 5.4b provides the composition of this group.

Males in the *late escalator* group reported a marginally higher parental attachment score than the male subsample in Waves 3 and 4. The distribution of married and cohabitating males differs for this group and the subsample at both waves. Although the percentage of married males in this group was lower in early adulthood, the percentage was higher in adulthood. The opposite pattern was found with regards to cohabitation. A larger percentage of males in this group were cohabiting at Wave 3 than the male subsample, but a smaller percentage of them were at Wave 4. Males in this group had less frequent contact with their friends in early adulthood than the males in general, but reported on average a marginally larger number of close friends in adulthood.

In Wave 3, the proportion of males in this group who drank, smoke, and were victims of violence was smaller than that in the male subsample. This was the case for smoking and drinking in Wave 4 as well. The proportion of males in this group who were victimized at Wave 3 was smaller than the proportion in all males. However, the percentage of males in this group who experienced violence victimization in adulthood was more than 3 times the percentage in males as a whole. Moreover, the percentage of males in this group who were victimized at Wave 4 is nearly 20 times the percentage of males who were at Wave 3.

5.3.3 Characteristics of the Male Versus Female Sample at Wave 3 and Wave 4

Although the compositions of each group for the males and the females cannot be compared because they are not the same, the extent to which the overall gender subsamples are different or similar on Wave 3 and Wave 4 characteristics are discussed here. The general social profile for males and females are similar with some exceptions. The average level of

attachment for males at Wave 3 is comparable to the average in the females, however it is slightly lower than the females in adulthood. A larger portion of males was not in a relationship at Waves 3 and 4 than females. The proportion of males and females in “other” relationship (i.e., in a relationship, but not cohabitating or married) in Waves 3 and 4 are similar. A larger proportion of females were married in early adulthood and adulthood than males. The percentage of females and males who were cohabitating at Waves 3 and 4 are similar. On average, the females and males had contact with their friends about 4 days a week in early adulthood, but the average for males is slightly higher. Both females and males reported an average 4 close friends in adulthood.

Overall, the risk profile for males and females are different. The average risk taking score in early adulthood and adulthood among is higher among males than females by about 0.5 points of a 5-point scoring range. Males in early adulthood showed a slight predilection for risk taking while females were more equally balanced between being positive and negative about risk taking. A larger proportion of males than females drank, smoked, and was victims of violence in Waves 3 and 4.

5.4 TIME VARYING RELATIONSHIPS AND VIOLENCE TRAJECTORIES BY GENDER

This section investigates whether the extent to which stability and changes in social relationships influence violence trajectories varies by gender. First it examines how the changing nature of males’ and females’ relationships with their parents across time affects violence trajectories and explicates whether the presence of romantic partnerships influences violence trajectories from adolescence into adulthood. As described for the full sample in

Chapter 4 (Section 4.4), separate group based trajectory models were conducted using these relationships as time-varying covariates into the specifications of the trajectory analysis that were established in Chapter 3. The two types of relationships are modeled separately because the results are close to impossible to interpret when modeled together. As before, the model without covariates is estimated because the trajectories can be interpreted as the “prototypical developmental path of trajectory group members” (Nagin, 2005, p. 124). Again, the dependent variable for these analyses were the number of acts of violence on a scale of 0 to 5 acts in the past 12 months is Waves 1-4 and the independent variable is age at Waves 1-4; the analyses are stratified by gender. The general equation forms for the time-varying covariate analyses are presented and described in Sections 4.4.1 (page 107) and 4.4.2 (page 109), respectively.

5.4.1 Parental Closeness as Time-Varying Covariate and Violence Trajectories by Gender

The results of the time-varying analysis of parental closeness are presented in Table 5.5a for females and 5.5b for males. For females, the estimates of parental closeness are all negative, with the exception of the *late escalator* trajectory, which suggest that higher levels of parental closeness are generally associated with less violence. However, only the estimate for parental closeness in the *high desister* trajectory is statistically significant and thus, is the sole female trajectory that is presented in Figure 5.1a. For males, all but the estimate for the high desister trajectory are negative; however the sole estimate of parental closeness that is significant is in the *chronic perpetrator* trajectory and therefore, is the only trajectory plotted in Figure 5.1b.

These figures provides a graphical representation of the estimated trajectories adjusted for parental closeness for two hypothetical levels for ease of interpretation: (1) a hypothetical male/female who has the respective subsample mean value of parental closeness at each wave and (2) a hypothetical male/female who has the minimum value at these times. The mean values for the female subsample are: Wave 1 = 4.577; Wave 2 = 4.444; Wave 3 = 4.546 and Wave 4 = 4.611. These mean values for the male subsample are: Wave 1 = 4.729; Wave 2 = 4.559; Wave 3 = 4.573 and Wave 4 = 4.631.

As can be seen in Figure 5.1a, the effect of parental closeness is most substantial in early adolescence, when the females in this trajectory are between the ages of 12-15 years old. Specifically, a hypothetical female with average levels of parental closeness is considerably less violent than a hypothetical female with minimum levels. This effect diminishes and disappears by early adulthood when the two hypothetical profiles essentially converge and have ceased being violent. Thus, parental closeness among females in the *high desister* trajectory seems to be important in adolescence only.

For a hypothetical male in the *chronic perpetrator* trajectory, as shown in Figure 5.1b, those with average levels of parental closeness are on a consistently less violent path than a hypothetical male with minimum levels of parental closeness. Unlike the time-limited effect of closeness on the female *high desister* trajectory, the effect of parental closeness on the male *chronic perpetrator* trajectory can be seen in adolescence through adulthood.

5.4.2 Romantic Partnership as a Time-Varying Covariate by Gender

The results of the analysis with romantic partnerships as time-varying covariates in the gender subsamples are provided in Table 5.6ab. The estimates of romantic partnership among females are positive for all but the *late escalator* trajectory. A positive coefficient indicates that being in a romantic relationship is associated with more violence. The estimates for romantic partnerships for females are statistically significant for all four trajectories, however the *low desister* trajectory is omitted from the figures because the comparative paths for this trajectory are nearly indiscernible when plotted.

As presented in Table 5.6b, the estimates for the romantic partnership among males are all positive, indicating that a romantic partnership boosts violence levels across these trajectories. The estimate of this social relationship is not significant, however, in the male *late escalator* trajectory.

The plots of trajectories in Figures 5.2ab-5.5ab provide easier interpretation of the significant effects of romantic partnership on the *high desister*, *late escalator*, and *chronic perpetrator* trajectories in the female subsample (a) and the *low desister*, *high desister*, and *chronic perpetrator* trajectories in the male subsample (b). The plots of the trajectories in these figures are of the same hypothetical scenario combinations of the presence of romantic partnerships from adolescence through adulthood that were presented for the full sample in Chapter 4. Figures 5.2ab-5.4ab show the plots of male and female trajectories for three hypothetical scenarios: (1) the presence of romantic relationships beginning in adolescence and continuing through adulthood, i.e., from Wave 1 to Wave 4; (2) the presence of a romantic partnership from the beginning of late adolescence and continuing thereafter, i.e., Waves 2 to

4; and (3) the presence of romantic relationships beginning in early adulthood and continuing to adulthood, that is from Wave 3 through Wave 4. Figure 5.5ab, in contrast, compares a female and then male who had a romantic relationship from adolescence through adulthood, i.e., Waves 1 to 4, to a respective female and male who had a romantic relationship in early-adolescence only, i.e., Wave 1, but not thereafter. Figures 5.2ab-5.4ab depict a status behavior change of not being in a relationship versus entering, whereas Figure 5.5ab illustrate a status behavior change of leaving a relationship versus remaining in one.

Presence of Romantic Relationship from Early to Middle Adolescence to Adulthood by Gender. Figure 5.2a show trajectories for a hypothetical female who is always in a romantic relationship from adolescence onward compared to a hypothetical female who is never in one. Figure 5.2b shows the trajectories of these hypothetical scenarios among males. As can be seen in Figure 5.2, the estimated trajectory for females in the *high desister* group given always being in a relationship is higher than the trajectory for never being in one. For this trajectory among females, always being in a romantic partnership increases the amount of violence solely during adolescence. As shown in Figure 5.2b, the same effect of romantic partnership is seen among males in both the *low desister* and *high desister* trajectories with the exception that it leads to more violent trajectories for a slightly longer period of influence than among females. Among both genders, for the *chronic perpetrator* trajectory, always being in a romantic relationship versus never increases violence from adolescence through adulthood.

For females in the *late escalator* group, the effect of a romantic partnership on the trajectory is apparent beginning in early adulthood into adulthood rather than in adolescence. Moreover, it has the opposite effect as it does for the other trajectories; that is, females who

always are in romantic relationships have *decreased* levels of violence compared to females who are never in these relationships. A romantic partnership acts as a deterrent on violent behaviors for this group, but only from early adulthood onward, and only for females.

Presence of Romantic Relationship from Middle to Late Adolescence to Adulthood by Gender. Figure 5.3ab illustrates the trajectories of a hypothetical person who is never in a relationship to a hypothetical person who is in a relationship from mid adolescence onward. Figure 5.3a, shows that the trajectory of a female in the *high desister* group who enters into a romantic relationship at Wave 2 and remains in one through adulthood has a marginal increase in violence than the trajectory of a female who is never in a relationship. The same effect is found among males in the *low desister* trajectory. These effects are limited to adolescence and there is no longer a difference between these trajectories in adulthood. A similar effect is found among trajectories for the males in the *high desister* group, but the magnitude of the influence of a romantic relationship is strong; it leads to a considerable increase in violence in middle adolescence to early adulthood.

As in the trajectories just described, entering into a romantic relationship in middle to late adolescence increases violence levels in mid-adolescence among female and male *chronic perpetrator* groups. However, unlike the time-sensitive effects of romantic partnerships in those groups, the presence of a romantic partnership leads to increased violence from mid adolescence through adulthood. Romantic partnerships only matter starting in early adulthood for the *late escalator* group in females, so there is essentially no difference in violent behaviors due to entering into romantic partnerships in mid-adolescence.

Presence of Romantic Relationship from Early Adulthood to Adulthood by Gender. Figure 5.4ab concerns the scenario of a hypothetical person who enters and remains in a romantic partnership in early adulthood onward to a hypothetical person who is never in a relationship. The effect of romantic partnership is negligible in the plots of the female *high desister* trajectories and the male *low desister* trajectories. For males in the *high desister* group, however, the effect of entering into a romantic partnership at Wave 3 still increases levels of violence to a small degree in early adulthood.

For the *chronic perpetrator* group among female and males, entering in a romantic partnership in early adulthood through adulthood leads to higher estimated levels of violence than never being in a relationship. As shown in Figure 5.4a, the impact of romantic partnerships on female *late escalator* trajectories becomes observable at Wave 3. In contrast to its effect in other groups, entering into a romantic partnership in early adulthood *decreases* levels of violence among females in this group. This effect is seen throughout adulthood.

Exiting a Romantic Partnership in Middle to Late Adolescence by Gender. In contrast to the above comparisons that examined the impact of entering into a relationship, Figure 5.5ab considers the impact of leaving a relationship. The trajectories in this figure are of a hypothetical person who is always in a relationship and someone who is in a relationship only in early to middle adolescence. The effect of leave a romantic partnership is essentially the opposite of entering into a relationship. Figure 5.5a shows that a female in the *high desister* group who exits a romantic relationship is on a trajectory of decreased violent activity in adolescence compared to a female who remains in one. The same effect is shown for males in

the *low* and *high desister* groups in Figure 5.5b. The impact of leaving of a romantic relationship in mid-adolescence however is more substantial in the male *high desister* group.

As just discussed, the impact of exits from romantic partnerships is evident only for a limited time for females and males in their respective groups that desist. For *chronic perpetrators*, exiting a romantic relationship and remaining *not* in a relationship leads to continued lower trajectories of violence compared to those are always in a romantic partnership. The impact of changing statuses from being in a relationship to not being in one in mid adolescence does not affect violence trajectories among females in the *late escalator* group.

5.5. MAIN VERSUS CONDITIONAL EFFECTS OF SOCIAL RELATIONSHIPS ON VIOLENCE TRAJECTORIES BY GENDER

The same interactions tested for the full sample in Chapter 4, Section 4.5 were analyzed by gender to see if the effects of one type of relationship on violence trajectories are independent of the other or if they are conditional (e.g., parental and friends) among females and males. As was the case for the full sample, none of the interactions were statistically significant at the .05 level of significance. It does not appear that there is an interaction between types of relationships and that main effects are the ones that matter for females and males. A variety of interactions between parental relationships and violence victimization were also tested to examine whether relationships with parents amplify or dampen the effect of violence victimization. Again, the addition of these interactions yielded non-significant Wald-

tests, indicating that it is the main effect of these relationships and experiences that are important.

5.6. CONCLUSION

This chapter discussed the results of a series of gender-stratified analyses examining the extent to which social relationships differentiate membership in the four trajectories for females and males. Social relationships distinguish group membership in similar and different ways by gender. Delinquent friends and incidents of child abuse increase membership in the *high desister* and *chronic perpetrator* group than *low desister* group for both females and males. Associating with delinquent friends and being abused as a child by a parent also increase the risk of membership in the *late escalator* group for females but not males. Parental attachment has a protective effect among females, such that higher levels of attachment decrease the risk of membership in the groups with elevated or longer term violent behaviors. Romantic relationships from early adulthood were found to not significantly differentiate group membership in the *female high desister* and *chronic perpetrator* groups. However, for males in the *high desister* and *chronic perpetrator* group, marriage functioned as a turning point such that being married increased the probability that they desisted versus continued perpetrating violence.

The analyses in this chapter on the time varying effects of parental closeness on trajectories by gender showed that a close parental relationship is most influential in lowering levels of violence during adolescence among females in the *high desister* group, however it is consistently influential in lower levels of violence among males in the *chronic perpetrator*

group. The effect of changing statuses from being not being in a romantic partnership to entering into one elevates the level of violence enactment within the *low desister*, *high desister*, and *chronic perpetrator* groups among males. The same pattern is found in the female *high desister* and *chronic perpetrator* groups. In contrast, for females in the *late escalator* group, romantic partnerships function as deterrents of violence in this group. This was a unique finding limited to females in this group.

As was found in the full sample, experiencing violence victimization is a very strong predictor of membership in a group that has increased or prolonged levels of violence for females and males. Furthermore, of all the other Wave 3 and Wave 4 social relationships and risk factors examined for the four trajectory groups (Section 5.3) in females and males, violence victimization is the sole variable for which there were substantial disproportionate distributions. The percentage of violence victimization is disproportionately large in the *chronic perpetrator* and *late escalator* groups whereas it is disproportionately small in the two groups that desist.

Table 5.1a Relative Risk Ratios (RRR) for Group Membership by Wave 1 Social Relationships and Demographic Characteristics: Females (n=6,107)

<i>Independent Variables^b</i>	I. High Desisters^a (n=1,100)			II. Chronic Perpetrators^a (n=518)			III. Late Escalators^a (n=569)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>									
Attachment to Parent (1-5)	0.762 ^{***}	0.664	0.875	0.798 ^{***}	0.654	0.974	0.925	0.753	1.136
Child Abuse Victimization (0-12)	1.100 ^{***}	1.054	1.149	1.085 ^{**}	1.035	1.137	1.068 ^{**}	1.023	1.115
Friends Care (1-5)	0.887	0.773	1.018	0.849	0.714	1.011	0.892	0.748	1.063
Contact with Friends (0-3)	1.218 ^{***}	1.106	1.341	1.069	0.922	1.240	1.061	0.925	1.218
Delinquent Friends (0-3)	1.317 ^{***}	1.176	1.474	1.208 ^{**}	1.059	1.377	1.176 ^{**}	1.058	1.306
Romantic Partnership (0=no/1=yes)	1.103 ^{**}	0.909	1.338	1.071	0.776	1.478	1.215	0.918	1.609
<i>Risk Factors</i>									
Drink Alcohol (0=no/1=yes)	1.057	0.978	1.141	1.111 [*]	1.008	1.225	0.871 [*]	0.784	0.966
Smoke (0=no/1=yes)	1.494 ^{**}	1.132	1.972	1.587 ^{**}	1.130	2.230	1.390 [*]	1.008	1.917
Violence Victimization (0=no/1=yes)	4.318 ^{***}	3.468	5.376	4.571 ^{***}	3.471	6.018	1.301	0.901	1878
<i>Demographic Characteristics</i>									
<i>Race/Ethnicity</i>									
Black/African American	1.973 ^{***}	1.529	2.545	3.243 ^{***}	2.239	4.698	1.438 [*]	1.019	2.028
Hispanic/Latino	1.774 ^{***}	1.299	2.421	1.644 [*]	1.045	2.584	0.948	0.636	1.414
Other	1.436	0.839	2.456	1.357	0.603	3.057	0.674	0.325	1.401
Asian American	1.898 ^{**}	1.236	2.913	1.451	0.721	2.920	1.499	0.965	2.327

Continues

Table 5.1a Continued

<i>Independent Variables^b</i>	I. High Desisters^a (n=1,100)			II. Chronic Perpetrators^a (n=518)			III. Late Escalators^a (n=569)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
<i>Family Structure</i>									
Parent and Step-parent	1.078	0.806	1.443	1.026	0.717	1.468	1.074	0.782	1.475
Single Mother or Single Father	1.109	0.870	1.412	0.715*	0.514	0.995	1.071	0.785	1.462
Other Family Structure	1.835*	1.049	3.211	1.425	0.729	2.785	1.571	0.810	3.047
<i>Household Income</i>									
≤ \$25,000	1.204	0.887	1.633	1.478	0.905	2.411	1.167	0.798	1.707
> \$25,000 ≤ \$50,000	0.948	0.706	1.273	0.854	0.515	1.417	1.016	0.759	1.360
Income Missing	1.113	0.816	1.517	1.115	0.658	1.889	1.090	0.737	1.613
<i>Parental Education</i>									
Less than High School	0.866	0.633	1.185	0.935	0.589	1.483	0.954	0.641	1.419
Some College/Tech School	0.796	0.624	1.017	0.768	0.523	1.128	0.826	0.598	1.142
College Degree	0.685**	0.533	0.881	0.532**	0.350	0.808	0.820	0.589	1.143
Graduate Degree	0.434***	0.292	0.646	0.479*	0.246	0.933	1.008	0.710	1.430
Education Missing	0.612	0.356	1.051	1.526	0.777	2.995	0.655	0.275	1.556

Weighted data.

F (75, 54) = 13.43, p<.001

a. Reference trajectory group is *low desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05

Table 5.1b Relative Risk Ratios (RRR) for Group Membership by Wave 1 Social Relationships and Demographic Characteristics: Males (n=5,090)

<i>Independent Variables^b</i>	I. High Desisters^a (n=1,284)			II. Chronic Perpetrators^a (n=780)			III. Late Escalators^a (n=265)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>									
Attachment to Parent (1-5)	1.372**	1.091	1.724	1.115	0.863	1.440	1.414	0.937	2.135
Child Abuse Victimization (0-12)	1.090**	1.037	1.146	1.142***	1.089	1.197	1.058	0.967	1.158
Friends Care (1-5)	0.907	0.790	1.042	1.012	0.838	1.221	1.026	0.799	1.318
Contact with Friends (0-3)	1.089	0.966	1.227	1.167*	1.029	1.323	0.948	0.800	1.123
Delinquent Friends (0-3)	1.342***	1.232	1.462	1.225**	1.078	1.391	1.089	0.899	1.320
Romantic Partnership (0=no/1=yes)	1.439**	1.159	1.787	1.302*	1.003	1.690	1.202	0.837	1.727
<i>Risk Factors</i>									
Drink Alcohol (0=no/1=yes)	1.141**	1.058	1.229	1.140**	1.050	1.237	1.055	0.920	1.210
Smoke (0=no/1=yes)	1.248	0.957	1.628	1.259	0.950	1.668	1.100	0.642	1.883
Violence Victimization (0=no/1=yes)	4.474***	3.557	5.628	3.760***	2.922	4.838	0.881	0.526	1.475
<i>Demographic Characteristics</i>									
<i>Race/Ethnicity</i>									
Black/African American	1.351	0.931	1.963	1.374	0.978	1.929	2.160**	1.287	3.624
Hispanic/Latino	1.231	0.869	1.743	1.336	0.965	1.848	1.449	0.783	2.679
Other	1.663	0.920	3.006	2.097*	1.035	4.248	1.019	0.375	2.764
Asian American	0.748	0.477	1.173	0.453*	0.219	0.941	1.090	0.550	2.162

Continues

Table 5.1b Continued

<i>Independent Variables^b</i>	I. High Desisters^a (n=1,284)			II. Chronic Perpetrators^a (n=780)			III. Late Escalators^a (n=265)		
	<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>		<i>RRR</i>	<i>95% CI</i>	
<i>Family Structure</i>									
Parent and Step-parent	0.934	0.774	1.126	1.250*	1.006	1.553	1.192	0.914	1.556
Single Mother or Single Father	0.931	0.796	1.089	1.117	0.885	1.409	1.036	0.819	1.311
Other Family Structure	1.072	0.690	1.667	1.376	0.812	2.331	0.931	0.497	1.744
<i>Household Income</i>									
≤ \$25,000	1.476**	1.113	1.958	1.631**	1.215	2.189	1.353	1.000	1.831
> \$25,000 ≤ \$50,000	1.155	0.920	1.450	1.194	0.927	1.538	1.053	0.811	1.369
Income Missing	1.120	0.838	1.496	1.140	0.833	1.559	1.273	0.945	1.715
<i>Parental Education</i>									
Less than High School	0.938	0.720	1.222	1.007	0.707	1.433	0.847	0.597	1.202
Some College/Tech School	0.691***	0.570	0.838	0.854	0.658	1.117	0.871	0.655	1.157
College Degree	0.667***	0.549	0.811	0.767*	0.571	0.986	0.838	0.637	1.103
Graduate Degree	0.564***	0.422	0.753	0.643*	0.458	0.903	1.102	0.826	1.471
Education Missing	0.812	0.539	1.224	1.595	0.939	2.710	0.473	0.225	0.992

Weighted data.

F (75, 54) = 6.89, p<.001

a. Reference trajectory group is *low desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05

Table 5.2a Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 Social Relationships and Demographic Characteristics: Females (n=1,618)

<i>Independent Variables^b</i>	Chronic Perpetrator^a (n=518)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>			
Attachment to Parent (1-5)	1.048	0.871	1.260
Child Abuse Victimization (0-12)	0.986	0.936	1.177
Friends Care (1-5)	0.957	0.779	1.038
Contact with Friends (0-3)	0.878	0.748	1.030
Delinquent Friends (0-3)	0.917	0.780	1.079
Romantic Partnership (0=no/1=yes)	0.971	0.688	1.370
<i>Risk Factors</i>			
Drink Alcohol (0=no/1=yes)	1.051	0.942	1.174
Smoke (0=no/1=yes)	1.062	0.709	1.590
Violence Victimization (0=no/1=yes)	1.059	0.778	1.441
<i>Demographic Characteristics</i>			
<i>Race/Ethnicity</i>			
Black/ African American	1.644*	1.089	2.482
Hispanic/Latino	0.927	0.563	1.524
Other	0.946	0.354	2.529
Asian American/Asian	0.764	0.371	1.575
<i>Family Structure</i>			
Parent and Step-parent	0.952	0.641	1.413
Single Mother or Single Father	0.645*	0.454	0.916
Other Family Structure	0.776	0.361	1.672
<i>Household Income</i>			
≤ \$25,000	1.227	0.752	2.004
> \$25,000 ≤ \$50,000	0.902	0.524	1.552
Income Missing	1.002	0.599	1.677

Continues

Table 5.2a Continued

<i>Independent Variables^b</i>	Chronic Perpetrator^a (n=518)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Parental Education</i>			
Less than High School	1.080	0.721	1.619
Some College/Tech School	0.965	0.667	1.395
College Degree	0.777	0.478	1.262
Graduate Degree	1.103	0.557	2.186
Education Missing	2.495*	1.199	5.192

Weighted data.

F (75, 54) = 13.43, p<.001

a. Reference trajectory group is *high desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05.

Table 5.2b Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 Social Relationships and Demographic Characteristics: Males (n=2,064)

<i>Independent Variables^b</i>	Chronic Perpetrator^a (n =780)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>			
Attachment to Parent (1-5)	0.813	0.632	1.046
Child Abuse Victimization (0-12)	1.047*	1.001	1.096
Friends Care (1-5)	1.115	0.945	1.317
Contact with Friends (0-3)	1.072	0.934	1.230
Delinquent Friends (0-3)	0.913	0.806	1.034
Romantic Partnership (0=no/1=yes)	0.905	0.683	1.199
<i>Risk Factors</i>			
Drink Alcohol (0=no/1=yes)	0.999	0.918	1.088
Smoke (0=no/1=yes)	1.009	0.754	1.349
Violence Victimization (0=no/1=yes)	0.840	0.660	1.070
<i>Demographic Characteristics</i>			
<i>Race/Ethnicity</i>			
Black/ African American	1.017	0.708	1.456
Hispanic/Latino	1.085	0.706	1.669
Other	1.261	0.661	2.406
Asian American/Asian	0.606	0.315	1.166
<i>Family Structure</i>			
Parent and Step-parent	1.506*	1.019	2.224
Single Mother or Single Father	1.407*	1.015	1.951
Other Family Structure	1.168	0.580	2.353
<i>Household Income</i>			
≤ \$25,000	1.087	0.740	1.596
> \$25,000 ≤ \$50,000	1.054	0.746	1.459
Income Missing	1.077	0.733	1.584

Continues

Table 5.2b Continued

<i>Independent Variables^b</i>	Chronic Perpetrator^a (n = 780)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Parental Education</i>			
Less than High School	0.764	0.493	1.183
Some College/Tech School	1.350	0.976	1.867
College Degree	1.312	0.931	1.850
Graduate Degree	0.961	0.540	1.373
Education Missing	1.534	0.813	2.895

Weighted data.

F (75, 54) = 6.89, p<.001

a. Reference trajectory group is *low desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05.

Table 5.3a Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 and Wave 3 Social Relationships and Demographic Characteristics: Females (n=1,618)

<i>Independent Variables^b</i>	Chronic Perpetrator^a		
	(n=518)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>			
Attachment to Mother/Father (1-5)	1.037	0.839	1.282
Child Abuse Victimization (0-12)	0.971	0.922	1.023
Friends Care (1-5)	0.959	0.778	1.182
Contact with Friends (0-3)	0.859	0.730	1.011
Delinquent Friends (0-3)	0.893	0.759	1.050
Romantic Partnership (0=no/1=yes)	0.996	0.713	1.393
<i>Relationships Wave 3</i>			
Attachment to Mother/Father (1-5)	0.902	0.698	1.166
Married	0.741	0.495	1.109
Cohabiting	0.936	0.626	1.399
Other Relationship	0.712	0.506	1.001
Contact with Friends (0-7)	0.999	0.936	1.065
<i>Risk Factors Wave 1</i>			
Drink Alcohol (0=no/1=yes)	1.026	0.915	1.152
Smoke (0=no/1=yes)	0.945	0.611	1.461
Violence Victimization (0=no/1=yes)	1.191	0.862	1.645
<i>Risk Factors Wave 3</i>			
Risk Taking (1-5)	1.198*	1.035	1.386
Drink Alcohol (0=no/1=yes)	1.359	0.838	2.028
Smoke (0=no/1=yes)	1.303	0.984	1.876
Violence Victimization (0=no/1=yes)	2.503**	1.460	4.386
<i>Demographic Characteristics</i>			
<i>Race/Ethnicity</i>			
Black/African American	1.795**	1.161	2.775
Hispanic/Latino	0.929	0.561	1.539
Other	0.785	0.277	2.227
Asian American	0.789	0.368	1.694
<i>Family Structure</i>			
Parent and Step-parent	0.908	0.598	1.378
Single Mother or Single Father	0.591**	0.407	0.857
Other Family Structure	0.724	0.336	1.560

Continues

Table 5.3a Continued

<i>Independent Variables^b</i>	Chronic Perpetrator^a		
	(n=518)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Household Income</i>			
≤ \$25,000	1.280	0.768	2.133
> \$25,000 ≤ \$50,000	0.912	0.522	1.594
Income Missing	1.032	0.602	1.770
<i>Parental Education</i>			
Less than High School	1.097	0.723	1.664
Some College/Tech School	0.917	0.632	1.332
College Degree	0.761	0.471	1.230
Graduate Degree	1.041	0.518	2.092
Education Missing	2.418*	1.154	5.065

Weighted data.

F (102, 27) = 9.67, p<.001

a. Reference trajectory group is *high desister*.

b. Demographic characteristics reference groups: race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05.

Table 5.3b Relative Risk Ratios (RRR) for Membership in Chronic Perpetrator Group Compared to High Desister Group by Wave 1 and Wave 3 Social Relationships and Demographic Characteristics: Males (n=2,064)

<i>Independent Variables^b</i>	Chronic Perpetrator^a		
	(n=780)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Relationships Wave 1</i>			
Attachment to Parent (1-5)	0.734*	0.561	0.960
Child Abuse Victimization (0-12)	1.048*	1.002	1.097
Friends Care (1-5)	1.102	0.937	0.295
Contact with Friends (0-3)	1.041	0.917	1.195
Delinquent Friends (0-3)	0.913	0.803	1.038
Romantic Partnership (0=no/1=yes)	0.911	0.689	1.205
<i>Relationships Wave 3</i>			
Attachment to Parent (1-5)	1.198	0.944	1.520
Married	0.477**	0.316	0.721
Cohabiting	0.911	0.653	1.271
Other Relationship	1.166	0.843	1.612
Contact with Friends (0-7)	1.050	0.994	1.110
<i>Risk Factors Wave 1</i>			
Drink Alcohol (0=no/1=yes)	1.012	0.928	1.103
Smoke (0=no/1=yes)	0.903	0.660	1.237
Violence Victimization (0=no/1=yes)	0.898	0.687	1.174
<i>Risk Factors Wave 3</i>			
Risk Taking (1-5)	1.160*	1.016	1.325
Drink Alcohol (0=no/1=yes)	0.885	0.672	1.134
Smoke (0=no/1=yes)	1.323	0.987	1.775
Violence Victimization (0=no/1=yes)	1.228	0.806	1.869
<i>Demographic Characteristics</i>			
<i>Race/Ethnicity</i>			
Black/African American	0.975	0.661	1.438
Hispanic/Latino	1.135	0.740	1.742
Other	1.257	0.651	2.429
Asian American	0.562	0.276	1.156
<i>Family Structure</i>			
Parent and Step-parent	1.434	0.970	2.211
Single Mother or Single Father	1.395	0.979	1.988
Other Family Structure	1.392	0.686	2.826

Continues

Table 5.3b Continued

<i>Independent Variables^b</i>	Chronic Perpetrator^a		
	(n=780)		
	<i>RRR</i>	<i>95% CI</i>	
<i>Household Income</i>			
≤ \$25,000	1.127	0.752	1.690
> \$25,000 ≤ \$50,000	1.088	0.676	1.543
Income Missing	1.143	0.767	1.705
<i>Parental Education</i>			
Less than High School	0.828	0.537	1.276
Some College/Tech School	1.380	1.000	1.903
College Degree	1.269	0.899	1.792
Graduate Degree	0.809	0.494	1.323
Education Missing	1.661	0.859	3.211

Weighted data.

F (102, 27) = 11.78, p<.001

a. Reference trajectory group is *high desister*.

b. Demographic characteristics reference groups: gender=female, race/ethnicity=non-Hispanic White, family structure=two biological parents, parental education (highest)=high school diploma/GED.

*** p<.001 ** p<.01 * p<.05.

Table 5.4a Percent Distribution or Mean (Standard Deviation) of Wave 3 and Wave 4 Social Relationships and Risk Factors for Each Violence Trajectory Group: Females (n=6,107)

<i>Variables</i>	I. Low Desisters (n = 3,920)	II. High Desisters (n = 1,100)	III. Chronic Perpetrators (n = 518)	IV. Late Escalators (n = 569)	V. Total (n=6,107)
<i>Relationships Wave 3</i>					
Attachment to Parent (1-5)	4.647 (0.539)	4.470 (0.749)	4.442 (0.838)	4.618 (0.674)	4.598 (0.622)
Relationship Status					
No relationship	30.1	22.1	28.5	29.4	28.5
Married	20.0	23.9	18.3	20.2	20.6
Cohabiting	15.9	24.1	26.4	19.0	18.5
Other Relationship	34.0	30.0	26.8	31.4	32.5
Contact with Friends (0-7)	4.434 (2.357)	4.436 (2.418)	4.487 (2.731)	4.546 (2.436)	4.449 (2.404)
<i>Risk Factors Wave 3</i>					
Risk Taking (1-5)	3.124 (1.100)	3.207 (1.139)	3.436 (1.162)	3.259 (1.163)	3.175 (1.121)
Drink Alcohol (0=no/1=yes)					
Yes	38.4	34.5	40.3	40.7	38.1
Smoke (0=no/1=yes)					
Yes	37.4	50.8	53.0	45.2	41.6
Violence Victimization (0=no/1=yes)					
Yes	2.2	4.2	10.6	4.1	3.4
<i>Relationships Wave 4</i>					
Attachment to Parent (1-5)	4.108 (0.847)	3.927 (0.892)	3.957 (0.972)	4.077 (0.949)	4.058 (0.878)
Relationship Status					
No relationship	17.2	19.5	19.5	22.8	18.3
Married	45.6	42.8	32.8	47.8	44.3
Cohabiting	18.4	20.3	26.3	17.5	19.3
Other Relationship	18.8	17.4	21.4	11.9	18.1
Close Friends (0-7)	3.129 (0.978)	2.890 (1.044)	2.873 (1.122)	3.129 (1.100)	3.067 (1.018)

Continues

Table 5.4a Continued

<i>Variables</i>	I. Low Desisters (n = 2,761)	II. High Desisters (n = 1,284)	III. Chronic Perpetrators (n = 780)	IV. Late Escalators (n = 265)	V. Total (n = 5,090)
<i>Risk Factors Wave 4</i>					
Risk Taking (1-5)	2.711 (0.973)	2.871 (1.042)	3.038 (1.160)	2.921 (1.117)	2.783 (1.019)
Drink Alcohol (0=no/1=yes)					
Yes	40.0	35.5	37.6	38.2	38.9
Smoke (0=no/1=yes)					
Yes	28.5	44.5	52.2	38.8	34.1
Violence Victimization(0=no/1=yes)					
Yes	7.1	13.2	65.2	80.8	19.1

Weighted data.

Table 5.4b Percent Distribution or Mean (Standard Deviation) of Wave 3 and Wave 4 Social Relationships and Risk Factors for Each Violence Trajectory Group: Males (n=5,090)

<i>Variables</i>	I. Low Desisters (n = 2,761)	II. High Desisters (n = 1,284)	III. Chronic Perpetrators (n = 780)	IV. Late Escalators (n = 265)	V. Total (n = 5,090)
<i>Relationships Wave 3</i>					
Attachment to Parent (1-5)	4.615 (0.498)	4.531 (0.566)	4.518 (0.632)	4.596 (0.418)	4.578 (0.580)
Relationship Status					
No relationship	44.3	35.6	38.8	35.0	40.7
Married	11.4	18.6	9.3	19.1	13.3
Cohabiting	14.4	19.4	19.3	18.9	16.7
Other Relationship	29.9	26.4	32.6	27.1	29.3
Contact with Friends (0-7)	4.316 (2.326)	4.264 (2.355)	4.744 (2.289)	3.936 (2.454)	4.348 (2.342)
<i>Risk Factors Wave 3</i>					
Risk Taking (1-5)	3.590 (0.968)	3.771 (0.938)	3.919 (0.898)	3.709 (0.986)	3.693 (0.958)
Drink Alcohol (0=no/1=yes)					
Yes	53.5	57.4	58.3	52.4	55.2
Smoke (0=no/1=yes)					
Yes	37.8	54.5	59.8	30.5	45.1
Violence Victimization (0=no/1=yes)					
Yes	4.7	10.2	14.3	4.4	7.6
<i>Relationships Wave 4</i>					
Attachment to Parent (1-5)	4.173 (0.785)	4.080 (0.795)	4.044 (0.803)	4.175 (0.790)	4.129 (0.792)
Relationship Status					
No relationship	25.8	21.2	23.4	23.3	24.1
Married	38.3	40.0	27.4	42.0	37.2
Cohabiting	16.7	21.3	21.7	12.8	18.5
Other Relationship	19.2	17.9	27.5	21.9	20.3
Close Friends (0-7)	3.252 (1.033)	3.138 (1.041)	3.137 (1.113)	3.310 (1.038)	3.207 (1.050)

Continues

Table 5.4b Continued

<i>Variables</i>	I. Low Desisters (n = 2,761)	II. High Desisters (n = 1,284)	III. Chronic Perpetrators (n = 780)	IV. Late Escalators (n = 265)	V. Total (n = 5,090)
<i>Risk Factors Wave 4</i>					
Risk Taking (1-5)	3.142 (0.950)	3.228 (0.919)	3.455 (0.957)	3.111 (0.964)	3.210 (0.950)
Drink Alcohol (0=no/1=yes)					
Yes	59.7	55.6	56.3	57.2	58.0
Smoke (0=no/1=yes)					
Yes	35.9	48.4	56.8	30.4	42.1
Violence Victimization(0=no/1=yes)					
Yes	10.8	13.6	63.5	81.7	23.2

Weighted data.

Table 5.5a Parameter Estimates (Standard Errors) of Time Varying Effect of Parental Closeness at Waves 1-4 on Violence Trajectories: Females (n=6,107)

<i>Trajectories</i>	Parameter Estimates^a			
	β_0	β_1	β_2	α_1
Low Desister	-1.005 ^{***} (1.897)	1.500 ^{***} (0.911)	b	-3.111 ^{***} (1.903)
High Desister	-8.717 ^{***} (2.215)	13.951 ^{**} (2.707)	-5.300 ^{***} (0.813)	-0.015 (0.045)
Chronic Perpetrator	4.132 [*] (0.722)	-3.122 (0.759)	0.570 (0.201)	-0.087 [*] (0.044)
Late Escalator	-5.900 ^{***} (0.615)	2.056 ^{***} (0.197)	b	0.025 (0.050)

Notes: Weighted data.

BIC= -17886.38

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}$

where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}}$

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

Table 5.5b Parameter Estimates (Standard Errors) of Time Varying Effect of Parental Closeness at Waves 1-4 on Violence Trajectories: Males (n=5,090)

<i>Trajectories</i>	Parameter Estimates^a			
	β_0	β_1	β_2	α_1
Low Desister	3.493 ^{***} (0.639)	-2.669 ^{***} (0.283)	b	-0.145 (0.085)
High Desister	-7.666 ^{***} (1.287)	9.849 ^{***} (1.442)	-3.112 ^{***} (0.406)	-0.058 (0.052)
Chronic Perpetrator	0.632 ^{***} (0.181)	b	b	-0.104 ^{**} (0.037)
Late Escalator	-7.316 ^{***} (1.832)	2.594 ^{***} (0.589)	b	-0.042 (0.150)

Notes: Weighted data.

BIC= -25769.25

a. Parameter estimates fit equation of the type: $\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}$

where $\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Closeness}_{it}}$.

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

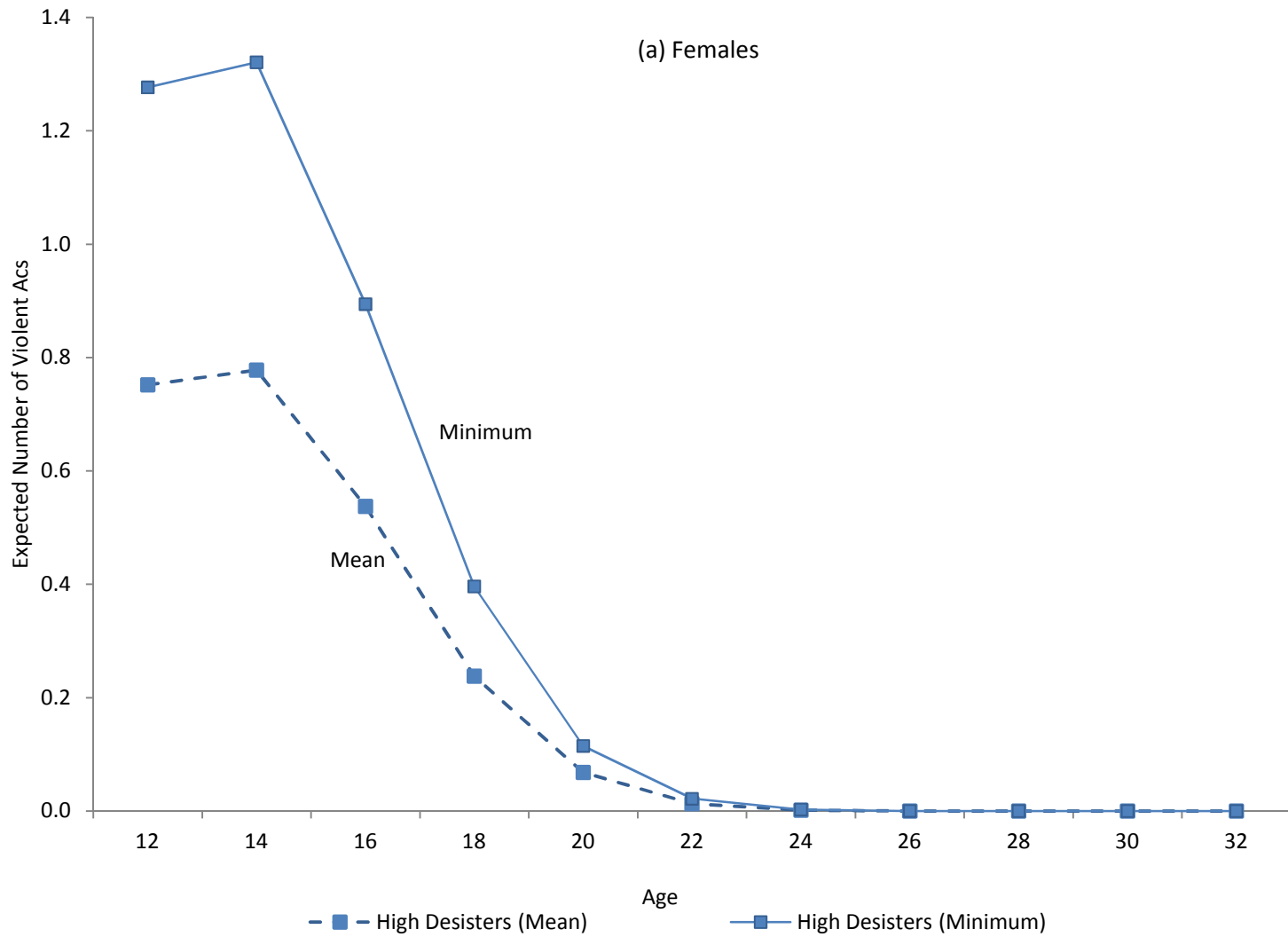


Figure 5.1a Females: Effects of Mean versus Average Levels of Parental Closeness on Violence Trajectories from Adolescence to Adulthood (Waves 1-4)

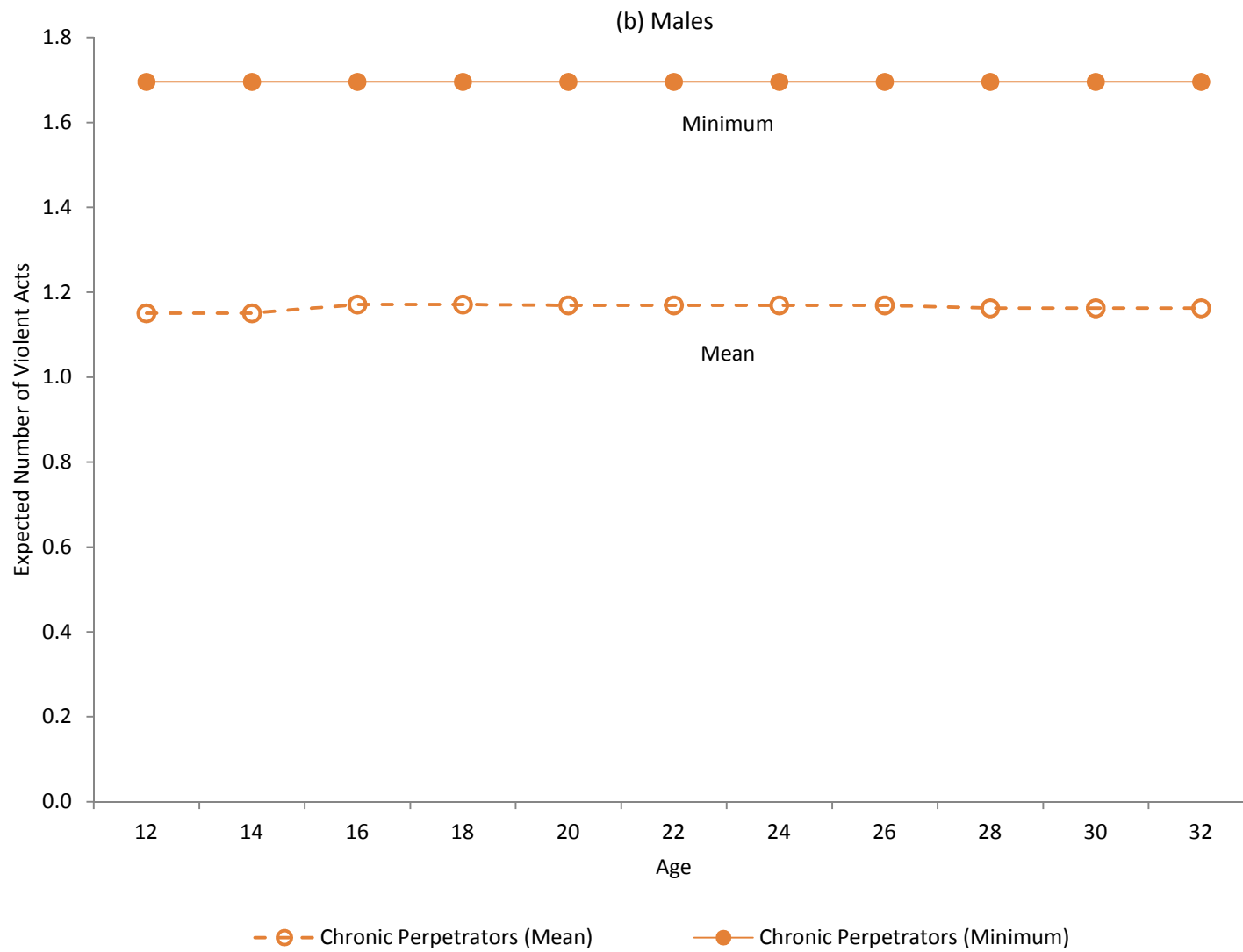


Figure 5.1b Males: Effect of Mean versus Average Levels of Parental Closeness on Violence Trajectories from Adolescence to Adulthood (Waves 1-4)

Table 5.6a Parameter Estimates (Standard Errors) of Time Varying Effect of Romantic Partnership at Waves 1-4 on Violence Trajectories: Females (n=6,107)

<i>Trajectories</i>	Parameter Estimates^a			
	β_0	β_1	β_2	α_1
Low Desister	4.747 ^{***} (0.667)	-4.725 ^{***} (0.491)	b	0.473 ^{**} (0.157)
High Desister	-13.140 ^{***} (2.367)	18.544 ^{***} (3.014)	-6.497 ^{***} (0.965)	0.313 ^{***} (0.083)
Chronic Perpetrator	4.081 ^{***} (0.778)	-4.093 ^{***} (0.838)	0.893 ^{***} (0.205)	0.205 [*] (0.085)
Late Escalator	-7.082 ^{***} (0.841)	2.551 ^{***} (0.295)	b	-0.210 [*] (0.103)

Notes: Weighted data.

BIC= -17844.84

a. Parameter estimates fit equation of the type: where

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Romantic}_{it} \text{ and}$$

$$\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Romantic}_{it}}$$

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

Table 5.6b Parameter Estimates (Standard Errors) of Time Varying Effect of Romantic Partnership at Waves 1-4 on Violence Trajectories: Males (n=5,090)

Trajectories	Parameter Estimates ^a			
	β_0	β_1	β_2	α_1
Low Desister	2.828 ^{***} (0.388)	-2.775 ^{***} (0.284)	b	0.385 ^{***} (0.109)
High Desister	-7.154 ^{***} (1.260)	9.434 ^{***} (1.467)	-3.004 ^{***} (0.411)	0.217 [*] (0.072)
Chronic Perpetrator	0.064 (0.073)	b	b	0.146 [*] (0.067)
Late Escalator	-7.815 ^{***} (1.611)	2.642 ^{***} (0.558)	b	0.187 (0.177)

Notes: Weighted data.

BIC= -25783.71

a. Parameter estimates fit equation of the type:

$$\ln(\lambda_{it}^j) = \beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Romantic}_{it} \text{ where}$$

$$\lambda_{it}^j = e^{\beta_0^j + \beta_1^j \text{Age}_{it} + \beta_2^j \text{Age}_{it}^2 + \alpha_1^j \text{Romantic}_{it}}$$

b. Fixed to 0.

*** p<.001 ** p<.01 * p<.05.

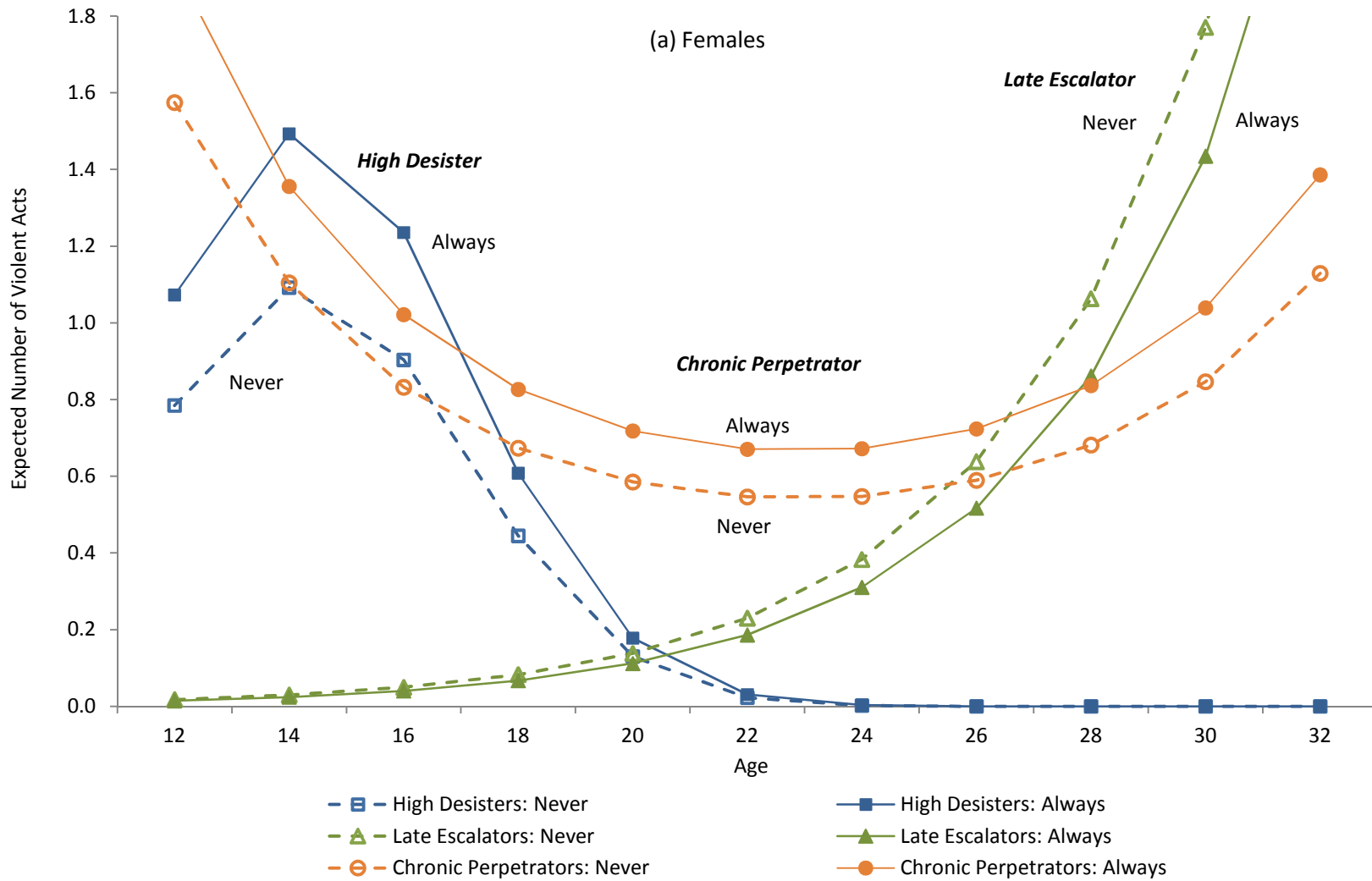


Figure 5.2a Females: Effect of Always versus Never having a Romantic Partner from Early to Middle Adolescence through Adulthood (Waves 1-4) on Violence Trajectories

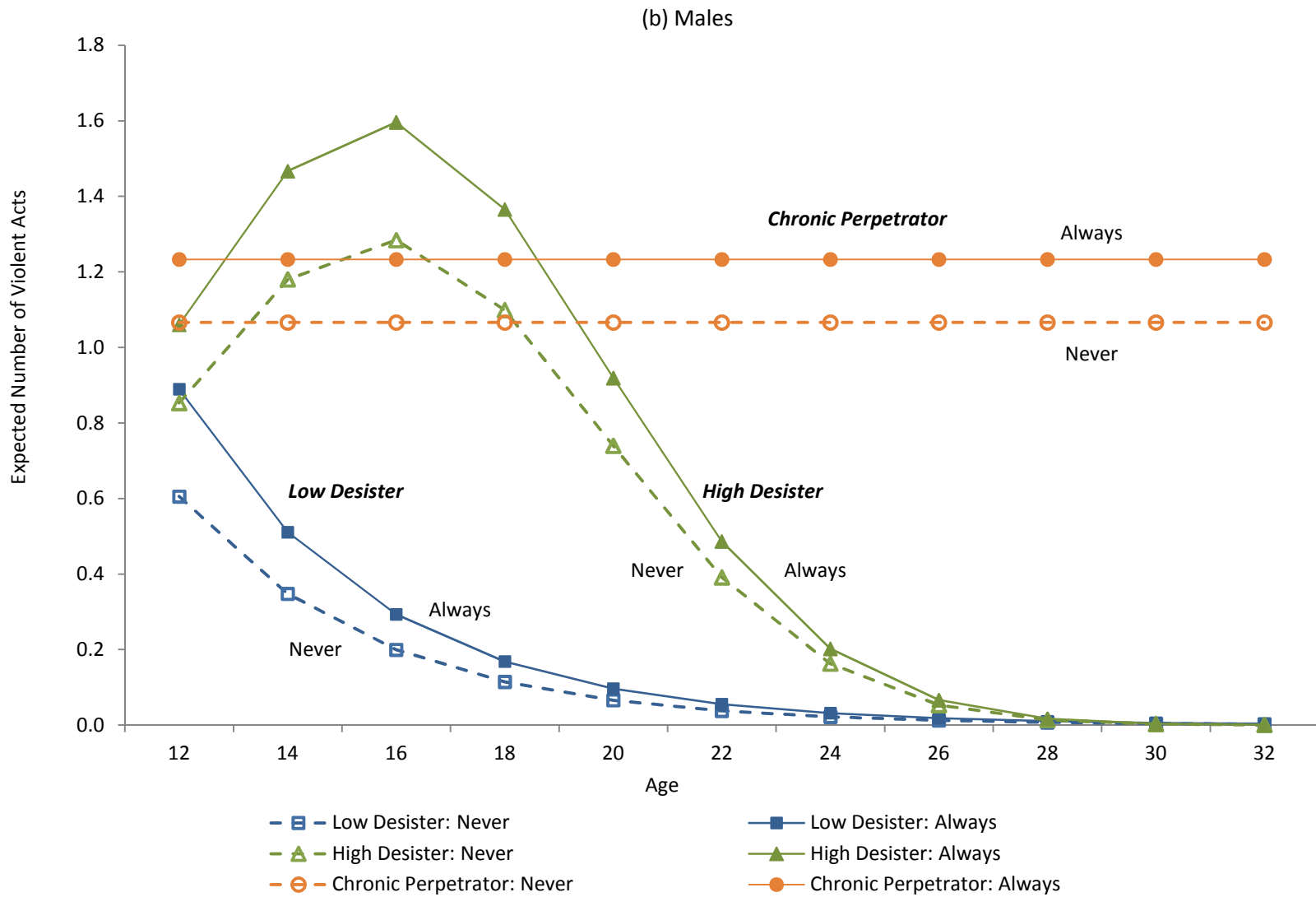


Figure 5.2b Males: Effect of Always versus Never having a Romantic Partner from Early to Middle Adolescence through Adulthood (Waves 1-4) on Violence Trajectories

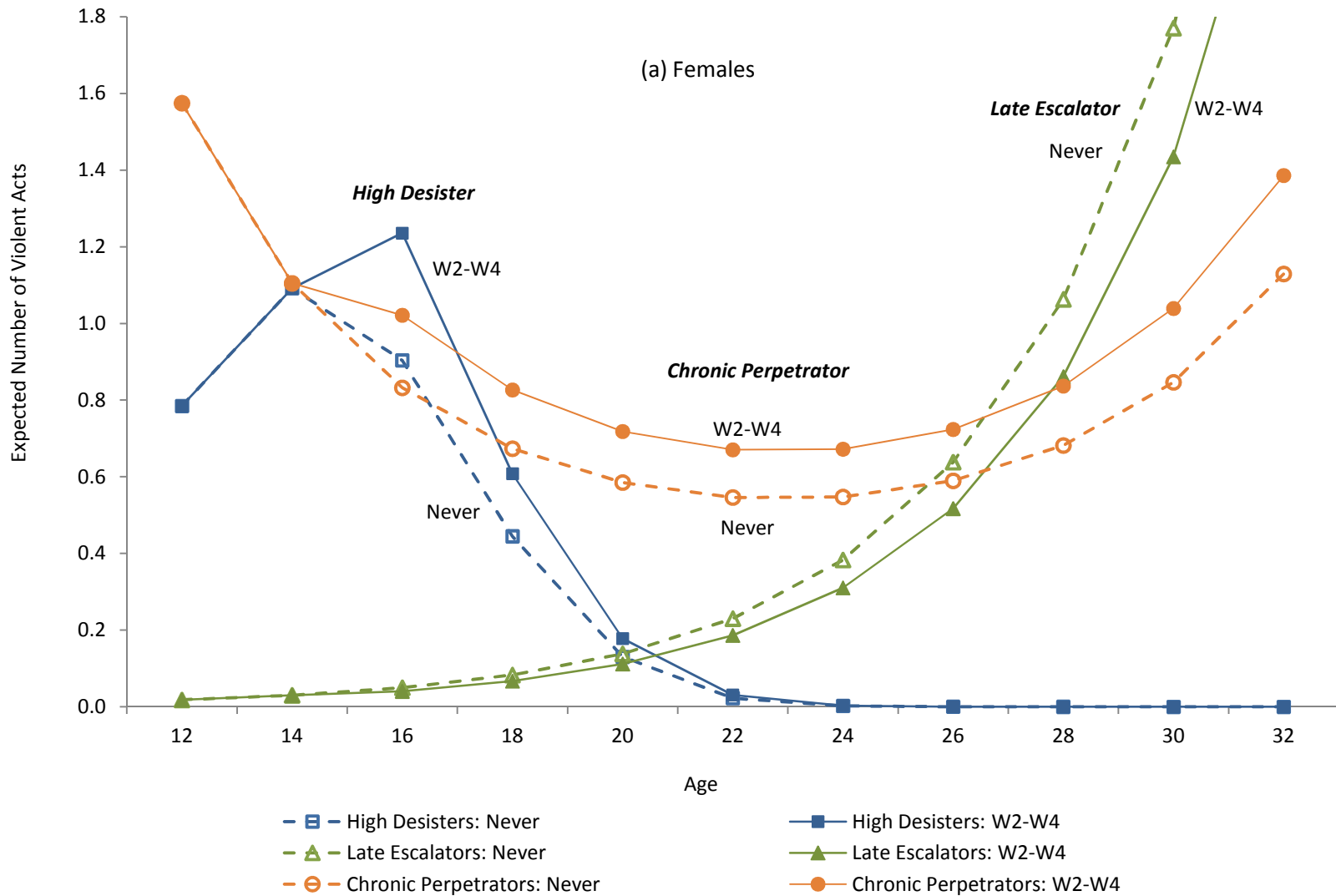


Figure 5.3a Females: Effect of having a Romantic Partner from Middle to Late Adolescence through Adulthood (Waves 2-4) on Violence Trajectories

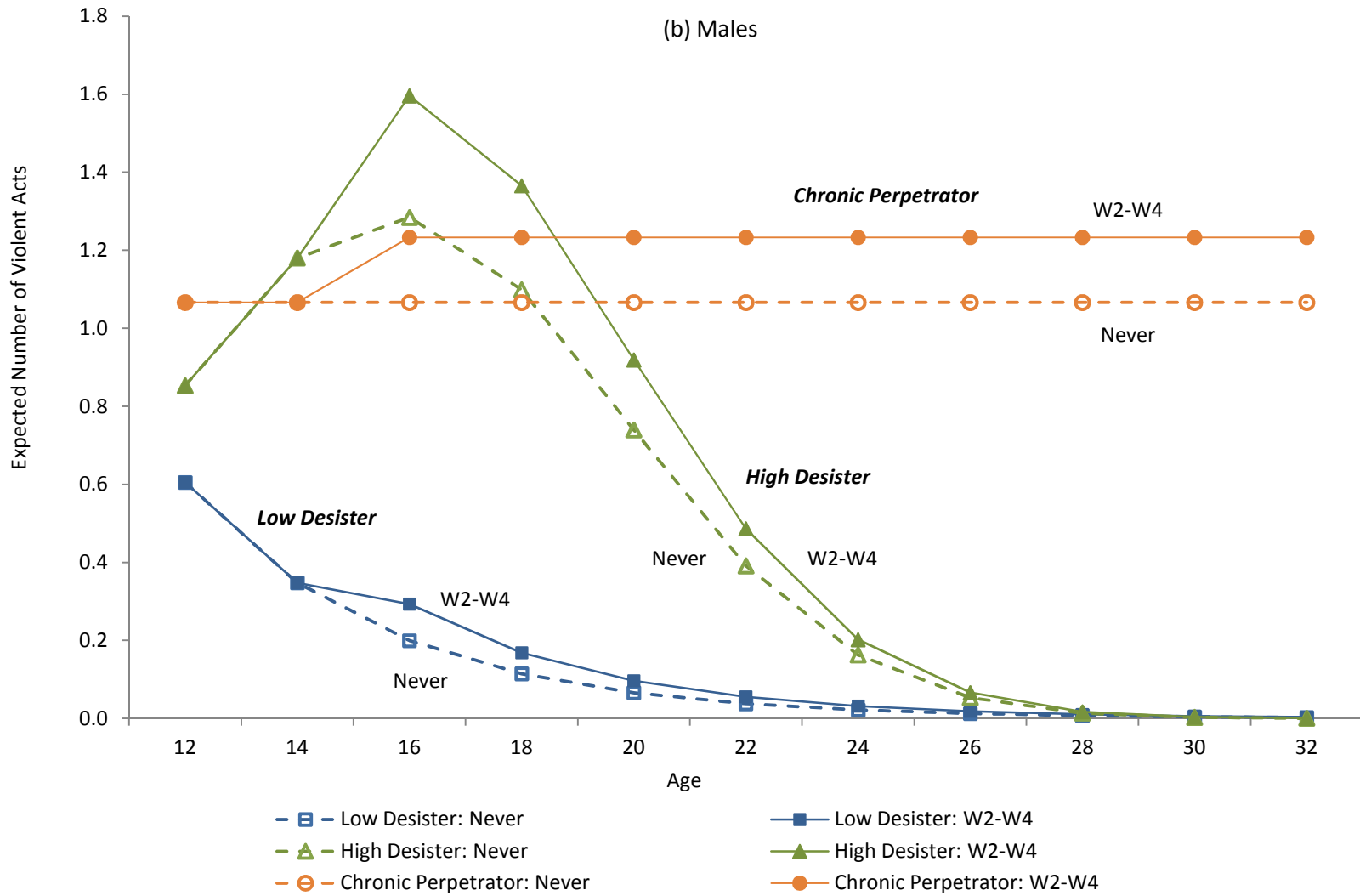


Figure 5.3b Males: Effect of having a Romantic Partner from Middle to Late Adolescence through Adulthood (Waves 2-4) on Violence Trajectories

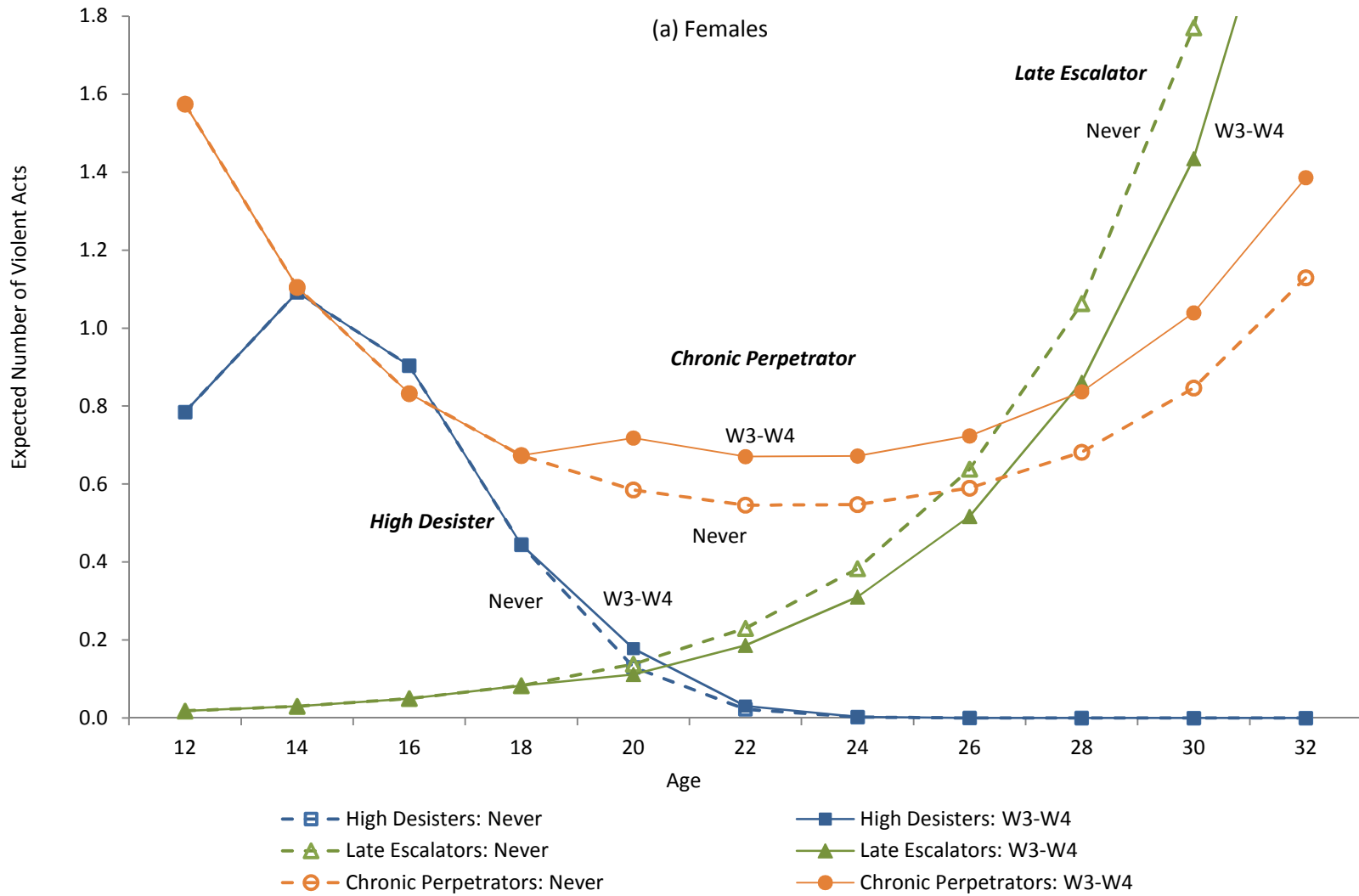


Figure 5.4a Females: Effect of having a Romantic Partner from Early Adulthood through Adulthood (Waves 3-4) on Violence Trajectories

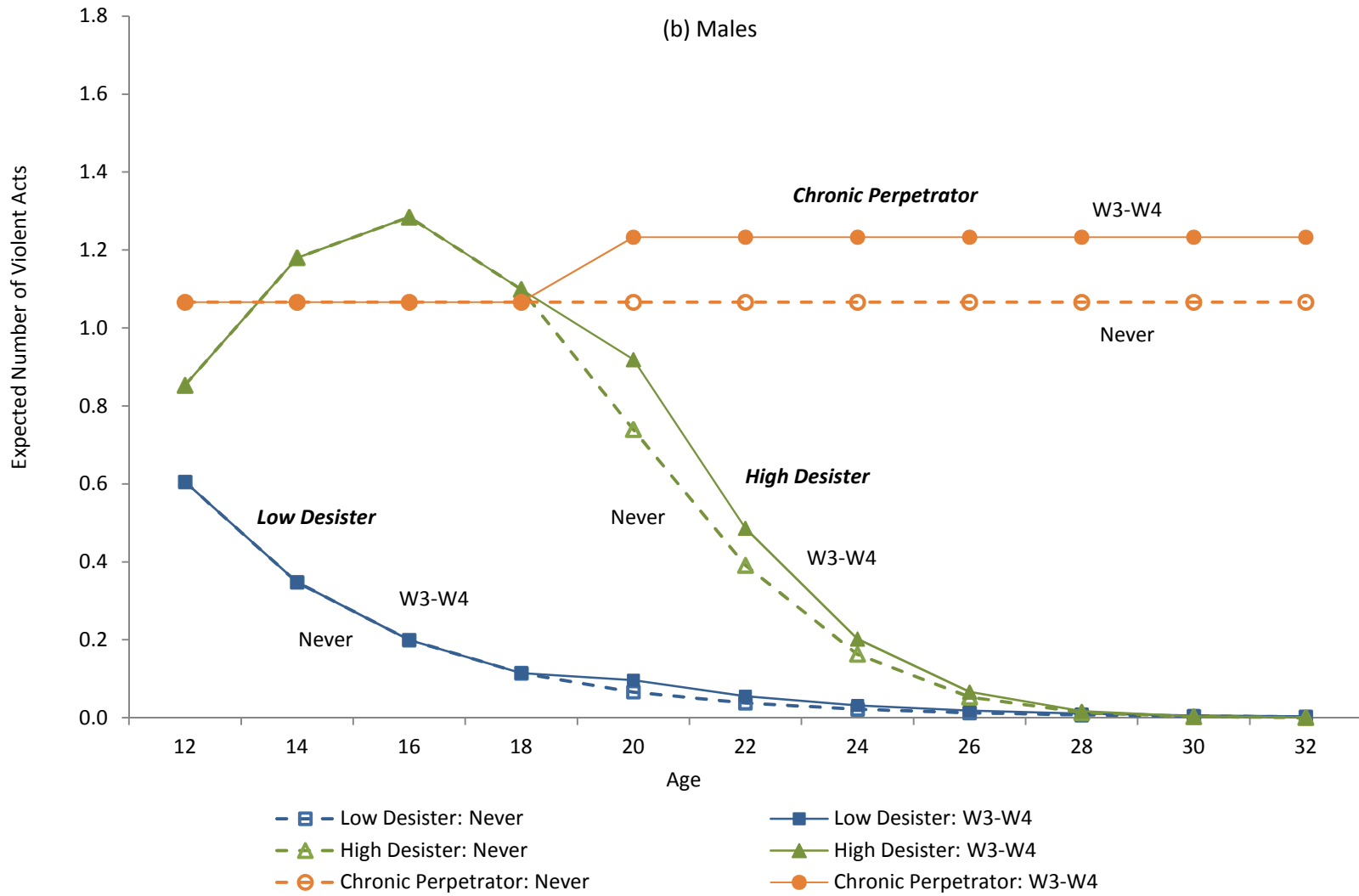


Figure 5.4b Males: Effect of having a Romantic Partner from Early Adulthood through Adulthood (Waves 3-4) on Violence Trajectories

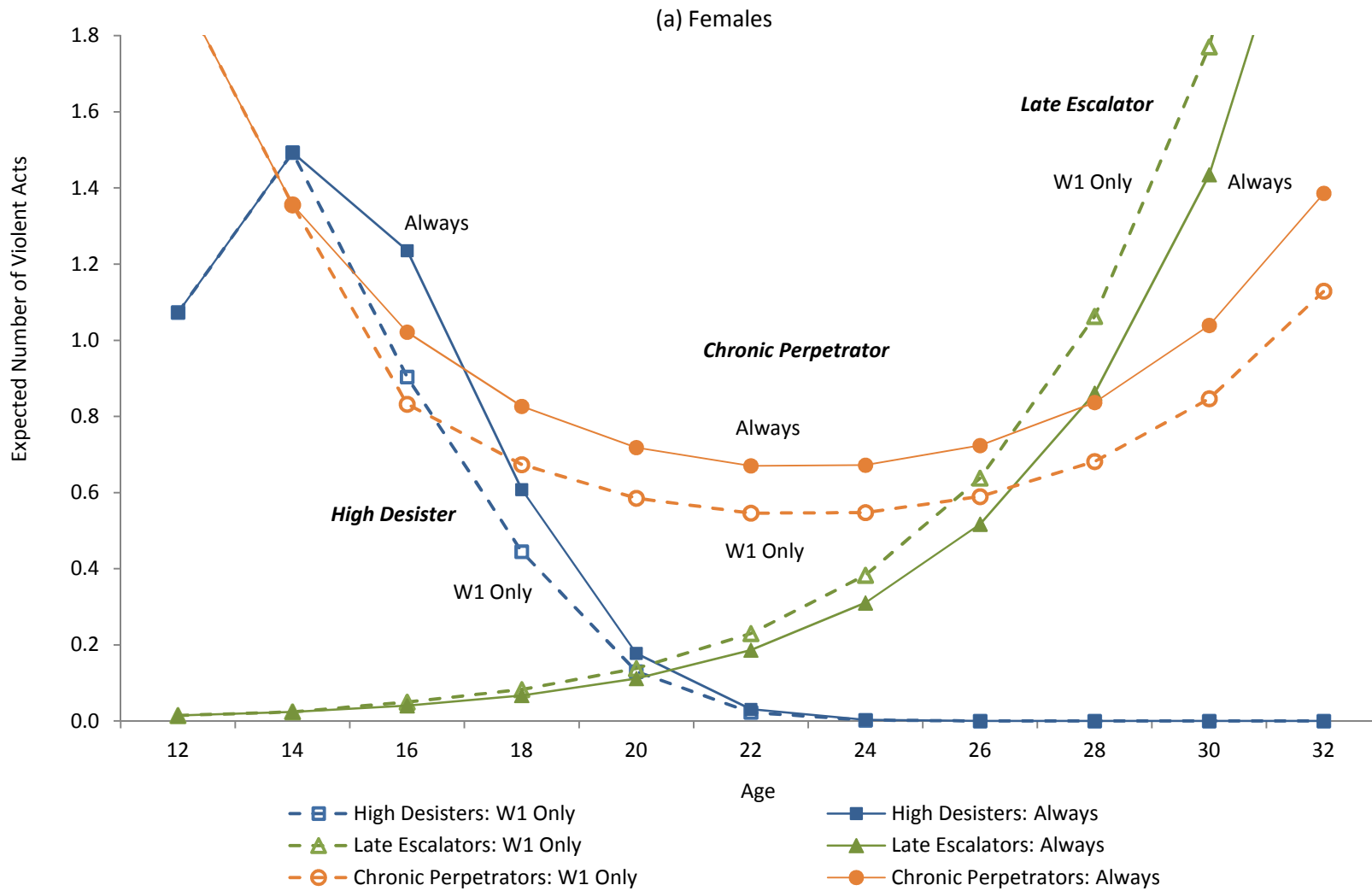


Figure 5.5a Females: Effect of Exiting a Romantic Partnership in Middle to Late Adolescence (Waves 2-4) on Violence Trajectories

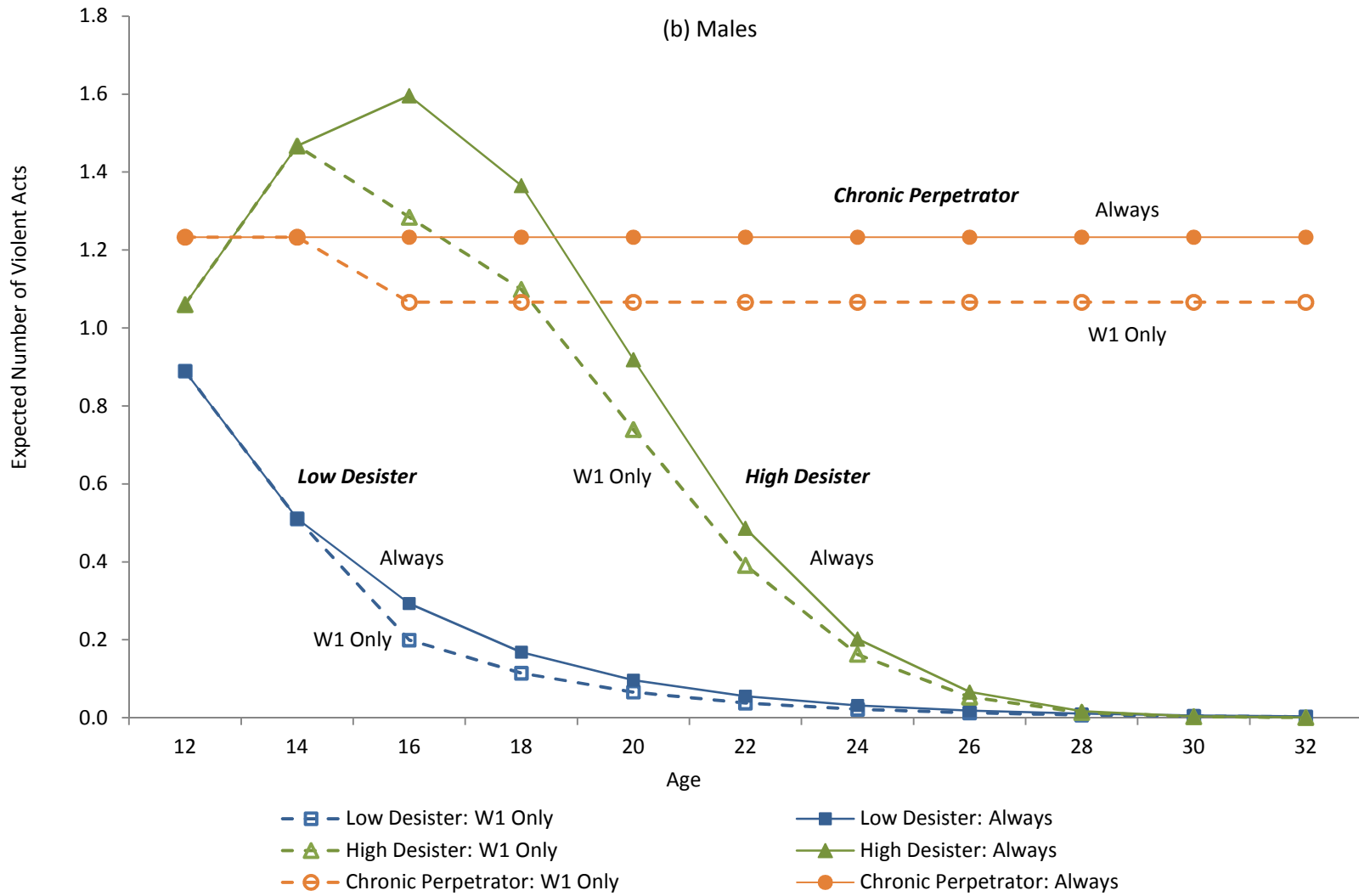


Figure 5.5b Males: Effect of Exiting a Romantic Partnership in Middle to Late Adolescence (Waves 2-4) on Violence Trajectories

CHAPTER 6: DISCUSSION

The purpose of this study was to elucidate the impact of relationships with parents, friends, and romantic partners over time on trajectories of violent behaviors over time. It sought to contribute to the knowledge base on violence by: (1) explicating trajectories of violent behaviors in adolescence through early adulthood into adulthood in the full sample and in gender stratified subsamples, (2) assessing the effects of social relationships in these trajectories, and (3) examining the extent to which these processes differ by gender. It drew from important concepts and viewpoints from the life course perspective, attachment theory, and social control theory to explore the ways in which social relationships over time are associated with violent behaviors across these life stages. Secondary analysis of the National Longitudinal Study of Adolescent Health was conducted to achieve the goals of this dissertation.

This chapter highlights the key findings from this study and discusses their implications. Next, it examines the strengths and limitations of this study. Finally, this chapter discusses the public health implications of this study and makes recommendations for further research.

6.1 KEY FINDINGS

6.1.1 Specific Aim 1: Trajectory Identification

The first aim of this study was *to identify distinct trajectories of violent behaviors from adolescence through young adulthood into adulthood by taking into consideration whether or not the person ever engages in violent acts, and if so, when these acts begin and when they*

terminate, if these acts do terminate. To achieve this aim, the group based modeling technique was used to identify trajectories of violence in the full sample and then for the sample stratified by gender. Based on several studies (Chung et al., 2002; Piquero, 2008; Sampson & Laub, 2005), the following four groups were hypothesized to be identified: (1) never violent, (2) adolescence limited, (3) chronic, and (3) accelerating. Although four groups were identified in this current study, they are not identical to those that were hypothesized. First, the analysis did not identify a never violent group despite the different number of groups and the several group shape configurations that were tested in the process of determining the ideal model for the sample and subsamples. Second, the analysis identified two adolescence limited groups, one that has low baseline levels of violence that desists early (i.e., *low desister*) and the other with relatively high levels of violence in early adolescence that increases in violent activity before it declines and desists later than the *low desister* group (i.e., *high desister*). Third, as hypothesized, a chronic group (i.e., *chronic perpetrator*) and an accelerating group (i.e., *late escalator*) were identified. The chronic perpetrator group has high levels of violence at baseline that persists into adulthood. The late escalator group begins its enactment of violence in early adulthood and escalates its participation in violence into adulthood. The groups in descending order of frequency in the full sample are: *low desister*, *high desister*, *chronic perpetrator*, and *late escalator*.

The same four groups established in the full sample were identified in the gender-stratified analysis. The groups listed from largest to smallest in the males are: *low desister*, *high desister*, *chronic perpetrator*, and *late escalator*. The order of these groups differs for females: *low desister*, *high desister*, *late escalator*, and *chronic perpetrator*. The *low desister*,

high desister, and *late escalator* groups follow similar shapes for males and females. The two female *desister* groups enact less violence overall and desist earlier than the corresponding groups. In contrast, the female *late escalator* group follows a steeper increasing curve than the corresponding male group. The differences in the shapes of the *chronic perpetrator* groups in males and females are more substantial. The male *chronic perpetrator* group has consistently high levels of violence, but the female group follows a u-shaped curve, first declining and then increasing their violent activity starting when they are in their 20's. In summary, although similar groups were found in the gender subsamples, the specific shapes and compositions of these groups vary somewhat for males and females.

6.1.2 Specific Aim 2: Social Relationships and Violence Trajectories

The second aim of this study was to *elucidate the influence of social relationships on trajectories of violent behaviors from adolescence into early adulthood through adulthood*. To achieve this aim, several different analyses were conducted to examine the extent to which social relationships with parents, peers, and romantic partners over time affect membership in the four trajectory groups identified for the full sample. First, a multinomial logistic analysis was conducted to determine the extent to which these social relationships from adolescence differentiate the probability of membership in the four groups with the *low desister* group as the reference group. Two relationship measures differentiate membership in all groups compared to the *low desister* group: child abuse by a parent and delinquent friends. They both function as promoters of violence such that more frequent incidents of abuse by a parent and more delinquent friends one associated with increase the risk of being in the *high desister*,

chronic perpetrator, and *late escalator* groups. With the exception of the *late escalator* group the presence versus absence of a romantic partnership in adolescence also increases the risk of membership in the groups relative to the low desister group. Although a secure attachment to a parent in adolescence was hypothesized to be an important aspect of social relationships, it did not matter in the full sample net of the other variables in the model.

Second, an alternative multinomial logistic regression was conducted to determine the extent to which social relationships from early adulthood explain why the two groups with high levels of violence in adolescence—*chronic perpetrator* and *high desister*—follow different paths: one discontinues enacting violence and the other continues. Being married versus not being in a relationship in early adulthood was identified as significant predictor of membership in the *chronic perpetrator* versus *high desister* group. It supports the hypothesis that marriage functions as a turning point that increases the probability of being in the group that desists versus the group that continues to perpetrate high levels of violence into adulthood.

Third, group based trajectory analyses were conducted to assess whether stability and changes in social relationships over time influence violence trajectories using time varying covariates. The influence of parental closeness and romantic partnerships from adolescence into early adulthood through adulthood were examined. The analysis for this question revealed that someone with a close parental relationship follows a trajectory with lower levels of violence compared to the trajectory of a person in the same group with a lower level of parental closeness. This effect matters most in early- to mid-adolescence in the *low desister* group, but has a consistent effect in the *chronic perpetrator* group from early adolescence through adulthood. Romantic partnerships act as turning points such that changing status from

not being in a relationship to entering into a romantic partnership *elevates* the level of violence enacted. Again, these effects are limited to adolescence for the *low* and *high desister* groups whereas it is significant throughout the period of adolescence to adulthood in the *chronic perpetrator* group.

Finally, several interaction terms were tested to determine the extent to which the effect of a certain type of relationships is independent or conditional on another type of relationship. Combinations of interactions involving parental attachment, the various friendship measures, romantic partnerships, and adult mentors were examined; however, none of these coefficients were significant, indicating that the main effects, rather than the conditional effects, are important in distinguishing the probability of membership in these four violence trajectories.

6.1.3 Specific Aim 3: Social Relationships and Violence Trajectories by Gender

The third aim of this study was to *determine how gender influences the impact of social relationships and turning points on violence trajectories*. To achieve this aim, the same analyses for Specific Aim 2 were conducted to determine whether the extent to which social relationships affect membership in the four trajectory groups differs for females and males differ. First, the extent to which people's relationships with parents, friends, and romantic partners during adolescence shape their enactment of violence was examined among males and females by conducting a gender stratified multinomial logistic regression. For both males and females, delinquent friends and incidents of child abuse increase the risk of membership in the *high desister* and *chronic perpetrator* group than the *low desister* group. These two

measures also increase membership in the *late escalator* group for females but not males. Romantic partnership distinguishes the *low desister* group from the *chronic perpetrator* and *high desister* group among males, but only in the *low-high desister* group comparison for the females. The presence of a romantic partnership increases the risk of membership in these groups relative to the *low desister* group. Parental attachment has as a protective effect among females, such that higher levels of attachment decrease the risk of membership in the *high desister* and *chronic perpetrator* group than the *low desister*. In contrast, this risk is increased among males in the *high* and *low desister* group comparison. None of the social relationship variables significantly predict membership in the male *late escalator* and *low desister* groups.

The extent to which social relationships with parents, friends, and romantic partners in early adulthood alter the course of violent behaviors in males and females was examined. These analyses compared the *high desister* and *chronic perpetrator* groups because they are the two groups that have similar trajectories in adolescence that diverge in early adulthood. Social relationships from early adulthood were found to *not* differentiate group membership in the *female high desister* and *chronic perpetrator* groups. However, being married versus not being in a relationship in early adulthood substantially decreases the probability of being in the *high desister* than the *chronic perpetrator* group among males. In other words, marriage functions as a turning point such that being married increases the probability that males who were enacting high levels of violence in adolescence cease versus continue perpetrating violence.

Group based trajectory analyses were conducted to determine whether the extent to which stability and changes in social relationships influence violence trajectories varies by

gender. The effect of parental closeness matters for females in the *low desister* group, but is limited to early- to mid-adolescence when high (versus low) levels of parental closeness substantially decrease the level of violence. Contrary to its time-limited influence among females, having a close relationship with parents for males in the *chronic perpetrator* group consistently lowers their average level of violence from adolescence to adulthood.

The effect of changing statuses from being not being in a romantic partnership to entering one elevates the level of violence enactment within the *low desister*, *high desister*, and *chronic perpetrator* groups among males. The same pattern is found in the female *high desister* and *chronic perpetrator* groups. In contrast, females in the *late escalator* group who are in romantic partnerships have a trajectory with lesser violence than a female counterpart in the group who is not in a romantic relationship. That is, it functions as a deterrent of violence in this group as opposed to as a provocation in the other groups. Further, this effect can be found in early adulthood to adulthood only.

As was the case for the sample as a whole, the effect of a particular type of relationship on violence trajectories is *not* conditional on the effect of another type of relationship. In other words, the relationships considered in this study only have main effects on violence trajectories. This applies to males and females.

6.1.4 Additional Findings: Demographic Characteristics, Risk Factors, Violence Victimization and Violence Trajectories

In summary, the general patterns described below were found among demographic characteristics and violence trajectories. Racial/ethnic minorities are more likely than non-Hispanic Whites to be in the *high desister*, *chronic perpetrator*, and *late escalator* groups

compared to the *low desister* group. The exception is for Asian Americans whose membership in the groups mostly did not differ from Whites. Another notable exception is among males, for whom race/ethnicity does not differentiate membership in the *low* and *high* desister groups. People whose family structures are not comprised of two biological parents have increased risk of membership in the three other trajectory groups relative to the *low desister* group than people who come from two biological parent households. Household income and parental education have an inverse relationship with membership in the *high desister*, *chronic perpetrator*, and *late escalator* groups relative to the *low desister* group. Fewer demographic characteristics were significant predictors of group membership between the *chronic perpetrator* and *high desister* groups.

Smoking and drinking in adolescence were significant risk factors that increased the risk of membership in the *high desister*, *chronic perpetrator*, and *late escalator* groups relative to the *low desister* group. People who enjoy taking risks in early adulthood are more likely to be in the *chronic perpetrator* than the *high desister* group.

Above and beyond the influence of social relationships, sociodemographic characteristics, and the risk factors just described is the impact of violence victimization. People who have been victims of violence in adolescence are more likely to be in the *high desister* and *chronic perpetrator* groups compared to people who have not been victimized. The magnitude of victimization is very strong. Experiencing violence victimization (versus not) for the first time in early adulthood increases membership in the group that continues to perpetrate violence relative to the group that desists for the full sample and among females. Additionally, people in *chronic perpetrator* and *late escalator* had disproportionately high

percentages of people who were victims of violence in Wave 4 for the first time compared to the sample as a whole, indicating that victimization is related to continued or increased enactments of violence.

6.2 IMPLICATIONS OF KEY FINDINGS

6.2.1 Trajectories of Violence

By identifying violence trajectories from early adolescence through adulthood in the full analytic sample and by gender, this study provides a richer understanding of violent behaviors than what is currently known. First, violence has typically been described as beginning in pre-adolescence, peaking in adolescence and substantially decreasing as people approach adulthood (Dahlberg, 1998; Loeber & Hay, 1997; Petts, 2009; Piquero et al., 2012; Sampson & Laub, 2003; Stouthamer-Loeber et al., 2004); and for the majority of the sample and for males and females separately in this study, this is true—the *low desister* and *high desister* groups follow this pattern and are the two largest groups identified in this study. However, this study suggests that even among people who cease their violent behaviors by early adulthood, there are two distinct groups. As described in the results above, there are many social relationships, risk factors, and demographic characteristics that distinguish membership in these two groups, emphasizing the importance of seeing them as disparate and not the same. Further, solely considering violence as following this pattern masks the behaviors of a substantial proportion of people who persistently exhibit high levels, and potentially more serious forms of violence (i.e., *chronic perpetrator*), and an additional group of people who begin violence in adulthood (i.e., *late escalator*).

Second, as mentioned earlier, contrary to previous studies on delinquency trajectories (Chung et al., 2002; Piquero, 2008) and one study which specifically looked at violence trajectories in males using the Add Health data set (Reingle et al., 2013), a never violent trajectory was not identified. Not detecting a never violent group does not imply that all people are violent; there are certainly people in the *low desister* group who were never violent but were assigned to it because it was the group they had the greatest probability of belonging to since a never violent group was not identified. The lack of identification of a never violent group, however, does suggest that many, if not most people are at least a little violent in early adolescence and that people who commit minimal levels of violence in early adolescence and only in early adolescence are similar to people who do not enact any levels of violence through the life course. Moreover, the fact that two groups that desist after adolescence were identified shows that people who commit minimal levels of violence in early adolescence are significantly different from people who commit higher levels of violence in adolescence before ceasing to be violent.

Third, the trajectories of violent behaviors, the compositions of these trajectories, and the relationships that significantly distinguish membership in the groups differ for males and females. Solely studying the violent behaviors of females and males as combined, or excluding females from studies of violence altogether can be misleading, inaccurate, and lead to a misrepresentation of females as non-violent. The findings in this study show that overall females exhibit less violence than males, which is consistent with what is generally understood about gender and violence. Additionally, analysis of the full sample showed that being male rather than female increases the risk of membership in the three trajectory groups compared to

the low desister group. However, relying solely on analyses based on the full sample would mask the fact that many females are indeed violent and that there are subsets of females who persistently perpetrate violence and females who begin their violent behaviors in adulthood. Moreover, the results from Specific Aim 3 (discussed previously) indicate that the influence of certain social relationships on trajectories of violence vary by gender, emphasizing the importance of understanding how the causal processes of violent behaviors vary for females and males. The gender-stratified results should stimulate research on violence among females and on gender differences in violent behavior.

Even though these findings point to important gender difference in the shape of some trajectories and their antecedents, it remains important to also consider the population as a whole. For instance, it is not possible to test for gender differences in the distribution of trajectory groups in the gender-stratified data because the groups are not comparable. In the pooled analysis, the groups are constrained to be the same, permitting a statistical test of gender effects on violence trajectories. Moreover, it is possible that the distinctive shape of a particular trajectory for the female sample is present in the population for males too (and therefore in the total population), but is not detected in the male sample due to sample size limitations, and vice versa. In this manner, examining violence trajectories on a total sample provides an overall understanding of the dominant patterns that exist in the population at large, and may identify additional trajectories, especially in research with much larger samples and longer period of observation across more data points. The within-gender analysis allowed this potential to emerge even though it was not seen in the full sample.

For example, although the *chronic perpetrator* groups among females and males are both persistently violent, their trajectories follow different paths. For females, this group has a decrease in violence before violence increases again, without ever desisting whereas among males, the *chronic perpetrator* group consistently enacts violence across time. A longer period of data collection prior to and following those covered by this study would provide a more accurate and detailed picture of whether these are in fact two different trajectories that follow distinct paths versus existing as one trajectory in the total population. Specifically, it would be interesting to see: (1) whether the female *chronic perpetrator* trajectory identified in this study can be identified in the population in addition to the path for the male *chronic perpetrator* group and (2) whether this group follows a U-shape path over the course of a longer period as found in this study or if it has more of an undulating trajectory such that the people in this group go through phases of enacting more violence and phases of less violence in a cyclical manner over time.

Expanding on the added value of studies with larger samples and more frequent data collection that cover a wider span of the life course contributing to the identification of additional trajectories, they can also determine more accurately the shapes of these trajectories. For example, it is unlikely that the *low desister*, *high desister*, *chronic perpetrator* groups suddenly became violent at age 12, the baseline age for the trajectories in this study. Having information prior to age 12 and after age 32 would establish more precise estimates of the patterns of violence enactment over time, and also when people begin and end their involvement in violence.

6.2.2 Social Relationships and Violence Trajectories

Parents. As discussed previously, despite a long history of research indicating that secure attachments to parents have deterrent effects on violent behaviors (Blum et al., 2003; Leiber et al., 2009; McNulty & Bellair, 2003b; Reese et al., 2000; Sokol-Katz & Dunham, 1997), as posited by attachment theory and control theory (Haynie et al., 2009; Ingram et al., 2007; Leiber et al., 2009), this effect was found only among females in this study. In fact, among males, an opposite effect was found. The reason why this occurs is not evident in these data, but it suggests that the influence of parental attachment potentially operates differently for males and females.

An additional dimension of the parent-child relationship that was examined in this study, parental closeness, showed that having close relationships with parents are important in following a path with lower levels of violence than people in the same group who are not as close with their parents. However, the magnitude and time frame of influence of the effect of parental closeness depends on a person depends on this person's group assignment based on his/her observed behaviors. Among people who are perpetually violent, being closer to one's parents leads to being on a consistently decreased involvement relative to someone who does not have as close of a relationship. Among people who eventually desist in early adulthood, the impact of parental closeness is most important during adolescence when it matters most, i.e., adolescence, when they are actively engaging in violence.

The detrimental impact of child abuse victimization as an instigator of violence is evident in this study and supports a well-established knowledge base on the negative impact of child abuse on violent behaviors (Dahlberg & Potter, 2001; Lansford et al., 2007; Loeber & Hay,

1997; Ranson & Urichuk, 2008). This adverse experience in the context of the parent-child relationship increases the risk of membership in all the groups in comparison to the minimally violent group. The results also point to the long-term and delayed impact of child abuse victimization on violence perpetration given that it increases membership in the *chronic perpetrator* and *late escalator* groups than the *low desister* group. This delayed effect of child abuse victimization is evident in the full sample and among females, but not among males. Moreover, child abuse has an escalating effect, increasing with each additional incident of abuse.

However, this study does not capture all the dimensions of the parent-child relationship. Family environments that are protective against violent behaviors include the nurturing and emotionally supportive aspects of the parent-child relationship that were used in the study, however other aspects of the parent-child relationship that have been found to be associated with violence, such as discipline, supervision, and monitoring were not included due to the limited availability of such measures in the Add Health data set (Banyard & Modecki, 2006; Demuth & Brown, 2004; Ingram et al., 2007; Leiber et al., 2009; Loeber & Hay, 1997; McCord, 1991). Inclusion of additional features of parental relationships may provide more detailed information regarding parental influences on violent behaviors over time. Moreover, the inclusion of questions regarding parental control, monitoring, and supervision in conjunction with the questions used in this study might better represent the concept of “attachment” used in social control theory and attachment; that is, parental attachment that leads to self-regulation and impulse-control (T. Hirschi & Gottfredson, 2000; Ingram et al., 2007; McNulty & Bellair, 2003b; Ranson & Urichuk, 2008; Sokol-Katz & Dunham, 1997; Stroufe et al., 2005).

Friends. As previous studies have found, relationships with friends are integral in promoting and deterring young people's risk for violence perpetration. This is the case especially in adolescence because it is a period in the life course when people spend a significant amount of time with their friends (D. Bottrell, 2009; Brendgen et al., 2002; Dahlberg, 1998). Specifically, closely associating with other adolescents who gravitate toward delinquent behaviors encourage or provide "normative support" for delinquent behaviors, such as violence (Haviland & Nagin, 2005). As established by existing literature, the results indicating higher probabilities of membership in the more violent groups than the *low desister* group based on associating with delinquent friends and the frequency of contact with friends is not surprising and on par with what was hypothesized. Like the impact of child abuse, delinquent friends also has a multiplicative effect such that each additional friend increases the risk of being in the any of other three trajectory groups in comparison to the low desister group substantially. Simply said, having 1 delinquent friend is not the same as having two delinquent friends; this additional friend considerably increases the risk of belonging to the *high desister, chronic perpetrator*, and *late escalator* groups than the low desister group when compared to someone who has no delinquent friends. This unfavorable influence of friends is found in the full sample and in females and males.

The positive influence of friendships in adolescence was generally not detected in any of the analyses, potentially due to the strength of the impact of delinquent friends. Measures of friendship in early adulthood were not significant in differentiating group membership either. This lack of statistical significance of the friendship variables in early adulthood potentially indicates the reduced influence of friends as people transition into adulthood. This is not to say

that friendships are not important in this time period, but that there are other relationships, circumstances, and roles that might override the influence of friends in regards to whether someone continues or ceases to be violent.

Romantic Partners. The measures of romantic partnership in this study were very limited. Only dichotomous and categorical variables of romantic partnership were used. Although the Add Health study included in-depth questions about relationships with romantic partners, including questions that gauge relationship expectations and quality, they were asked of a very small subset of the sample at Waves 3 and 4. Thus these questions were not included in this study. Despite this limitation, unique effects of romantic partners were identified.

An important finding about romantic partnerships that was uncovered as a result of comparing the high desister group with the chronic perpetrator based on their early adulthood social relationships and other characteristics is the impact of marriage. Marriage functions as a turning point in that people who are married versus not in a relationship are more likely to cease their violent activity than continuing their enactment of violence at relatively high levels. This was found in the full sample and among males. This supports suggestions from previous retrospective qualitative and cross-sectional studies and the concepts espoused by the life course perspective and social control theory that forming new bonds, such as marriage, can serve as turning points (Marcus, 2009; Petts, 2009; Sampson et al., 2005). More importantly, this statistically significant link provides basis for inferring the effect of a spouse in one's desistance from violent behaviors since this dissertation used longitudinal data.

Based on the analyses that compared the presence and absence of romantic partnerships on trajectories within groups, the direction of influence of romantic partnership

depends on age, or life stage, the type of violence trajectory group a person is most likely to be assigned to, and gender. Romantic partnerships impact violent behaviors in groups that are violent in adolescence and desist in adulthood. They also have the same effect on people who are consistently violent, irrespective of life stage. In contrast, among females who begin their violent behaviors in adulthood and increase their levels of violence enactment, being in a romantic partnership actually leads to lower levels of violence compared to females who are not in a romantic relationship. Among females who are in the late escalator group, romantic partnership is a deterrent in the amount of violence she perpetrates in adulthood.

6.2.3 Demographic Characteristics and Violence Victimization and Violence Trajectories

Race/Ethnicity. Racial/ethnic minorities compared to Non-Hispanic Whites have increased probability of membership in groups with higher levels and longer durations of violent behaviors than in the group with minimal violence that desists early, as described previously. This finding is not unique to this study. Research on violence has documented consistent racial/ethnic differences in rates of violence (Hawkins, Laub, Lauritsen, & Cothorn, 2000; J. M. Kaufman, 2005; McNulty & Bellair, 2003a, 2003b). However, most of these studies were based on cross-sectional descriptive data and limited to males.

Although the pattern stated above is the general finding of this study, this dissertation additionally found that the same comparative pairs of racial/ethnic minority and non-Hispanic Whites did not consistently differentiate group membership. Furthermore, race/ethnicity did not differentiate group membership across groups among males as it did among females and in the full sample. Although race/ethnicity was found to significantly differentiate membership in

the *chronic perpetrator* versus *high desister* group when other Wave 1 and Wave 3 measures are held constant among females, it did not matter for males and the full sample. In fact, none of the sociodemographic characteristics were significant in this comparison in the male subsample, indicating that other experiences or circumstances determine whether males who have perpetrated high levels of violence through adolescence continue to do into adulthood or desist. This indicates not only the importance of examining trajectories of violence by race/ethnicity, but also the necessity to consider violence trajectories based on the intersection of race/ethnicity and gender.

Violence victimization. Given that the effect of violence victimization on violence perpetration—people are victimized and thus, they victimize—is profound in creating a pervasive cycle of violence, it provides an important argument for the need to better understand the process by which people become violent. This not a new finding; numbers of studies have correlated aggression with violence exposure (Aisenberg & Herrenkohl, 2008; De Coster, Heimer, & Wittrock, 2006), however the magnitude of this experience, after adjusting for social relationships and demographic characteristics, is cause for serious concern.

6.3 STRENGTHS AND LIMITATIONS

6.3.1 Limitations

There are a number of limitations to this study. Although the response rates for each of the waves were high, people with repeat and high rates of violence are likely to be missing from the start (absent from school or not enrolled in school) or are more likely to have dropped out of the study over time (Piquero et al., 2003). Therefore, there is a large possibility that those

who are at the highest risk for violent behaviors are disproportionately not included in the study. People who were included in the sample versus those who were not due to analytic drops and attrition, significantly differ on Wave 1 violence counts. Specifically, the percentages of people who were lost to follow up were larger for people with higher counts of violence at Wave 1 suggesting that it is likely that this study underestimates the prevalence of violent acts. However, sample weights compensate.

The Add Health measures for key variables are not optimal. For example, some of the response categories of violence were sensitive to the frequency of violent behaviors whereas others were limited to yes/no responses. Thus, each of the questions regarding specific violent acts was dichotomized to reflect whether or not respondent had enacted the specific behaviors. Limiting these variables to yes/no underestimates the amount of violent behaviors actually reported. As mentioned previously, there are also several limitations inherent in the Add Health measures of social relationships. Parental relationship variables investigated in this study, i.e., attachment, closeness and child abuse, do not cover all the dimensions of the parent-child relationship. Additionally, only parental closeness was assessed at all waves, and hence was the only parent measure to evaluate the parent relationships as being dynamic. Moreover, the questions related to friends and romantic partners are even less consistent and complete than parental relationships.

Although this study covered a wide range of ages in the life course (ages 12-32) and identified distinct trajectories of violence within this range, these groups are limited by the available data used to estimate them. Specifically, it is likely that most of the violent people in these groups were violent before age 12, but this analysis is limited to age 12 for baseline

assessment of these behaviors. Similarly, there lacks certainty about whether the groups that desisted within the time frame covered in this study continued to abstain from violence or not. Because this study began in early adolescence, it did not allow for examination of early childhood processes that, according to attachment theory, form the foundation for the development of a securely attached relationship with parents and the development of socio-emotional skills necessary to face emotional challenges or feelings of distress (Grossmann et al., 2005; Petts, 2009; Ranson & Urichuk, 2008; Stroufe et al., 2005). Access to information on early childhood relationships, experiences, and dispositions can provide more in-depth information on the factors that differentiate violence trajectory group membership.

6.3.2 Strengths

This study has a number of strengths that constitute valuable contributions to the literature on violence from adolescence into early adulthood through adulthood. First, the sample yields excellent external validity. At the start of the study the sample was nationally representative of students in grades 7 through 12. Although there has been attrition, sample weights were applied to adjust for this attrition over time, so results are generalizable to males and females in the U.S. in this age cohort. Second, the large sample size has good statistical power and permits the use of appropriate methods of analysis. Third, the longitudinal design enables the identification of distinct trajectories of violence using a new and advanced methodological approach. Moreover, repeat measures of relationships allow the use of social relationships as time-varying covariates to examine how changes in relationship statuses impact violent behaviors. This is important because relationships are dynamic.

Substantively, this study provides a description of stability and change in violent behaviors from adolescence to adulthood. Previous studies on violence are limited because they (1) are cross-sectional or include data only from two time points, or (2) have small sample sizes, and/or (3) are limited to people who are incarcerated, on probation, or in group homes (Fergus & Zimmerman, 2004; Marcus, 2009). Instead this study uses four waves of data with a representative sample to identify heterogeneous patterns of violence. Existing descriptions of trajectory groups are principally of criminal offending and delinquent behaviors, but not violence *per se*. By identifying trajectories of violent behaviors, this study also segues well with recent and growing interest in public health on the developmental perspective on how behaviors subdivide the population into different pathways (trajectories) and assume different causal influences for each trajectory (Sampson & Laub, 2005).

By examining violence trajectories in the full sample and by gender, this study provides valuable insight into patterns of violence in the population at large, but also how they differ in males and females. A recent study using the Add Health data set (Reingle, 2013) limited its sample to males on the basis that the rate of violence is greater among men and that men typically exhibit higher levels of risk. Contrary to that study, the current study included females despite the lower rate of violence among females because their involvement in violence is substantial and still pose a threat to the safety of others. Furthermore, this study identified similarities and differences between female and male trajectories. Moreover, this study considered how the protective and risk processes of social relationships on violence trajectories differ by gender, which is new information to the field.

This study simultaneously examines multiple social relationships. While many studies have considered the impact of parents and/or peers, rarely have other relationships been included in the study of violence. This study included romantic partners as important social relationships that influence patterns of violence in adolescence through adulthood. Additionally, this study examined multiple social relationships across multiple time periods to determine whether the influence of these relationships are consistent across time or only at sensitive periods at which they most critical to violent behaviors.

Previous studies using the trajectory analysis often are limited to baseline information to make causal inferences distinguishing membership in the groups identified. Had the trajectory analysis not identified two groups that diverge in early adulthood when data about social relationships were available, this study would have been limited to reliance on Wave 1 information to predict group membership. However, the coinciding of the divergence with the availability of data provided a unique opportunity to explore the possibility of examining experiences or changing circumstances as “turning points” and thus identified marriage as one.

6.4 PUBLIC HEALTH IMPLICATIONS

There are important public health implications and recommendations for future research based on the following findings from this study: (1) there are distinct trajectories in the population and these trajectories are both similar and different for females and males; (2) child abuse victimization by a parent significantly increases the risk of violence and significantly distinguishes violence trajectories; (3) associating with delinquent friends during adolescence significantly increases the risk of violence and significantly distinguishes violence trajectories;

(4) romantic partnerships can be both deterrents to and provocations of violence; and (5) violence victimization begets violence perpetration.

First, although understanding the pattern of violence based on a population average provides meaningful information about the general occurrence of violence it masks important details about the heterogeneity of this behavior over time. Specifically, people who are consistently violent and people who have begun their violence involvement in adulthood do not follow the general pattern of violence that is considered to be limited to adolescence. Moreover, the average violence pattern would disproportionately be driven by males due to their higher rates of violence perpetration. Future studies on violence trajectories that cover a wider range of the life course than this study can potentially provide more precise estimates of violence trajectories and more accurate estimates of when people in these groups begin and end their involvement in violence.

A history of abuse by a parent affects violence perpetration in a number of ways. First, it has proximal, distal, and persistent effects on violence perpetration. Findings from this study showed that child abuse victimization increased the risk of membership the *high desister* (proximal effect), *chronic perpetrator* (persistent effect), and *late escalator* (distal effect) groups. This indicates that the impact of child abuse is substantial and preventing it is integral to the prevention of violence as a whole. Second, as discussed before, the effect of child abuse is on a gradient such that an increase in the number of times a person is abused increases the risk of violence considerably. This specifically points to the importance of terminating child abuse when it does occur.

Given the profound impact of violence victimization on violence perpetration, it is imperative to understand the conditions and contexts that put people at risk of violence victimization. This includes having information on when, by whom, and under what circumstances a person is victimized. It is also necessary to gain more insight into how people who have been victims of violence and then perpetrate violence differ from people who have been victims of violence and do *not* subsequently perpetrate violence.

Associating with delinquent friends has the same pattern of influence on violence perpetration as child abuse. It has immediate, delayed, and persistent effects on the risk of violence. Moreover, it also has a gradient effect such that the more delinquent friends a person associates with, the greater the increase in the risk of violence in a multiplicative, rather than additive. Intervention and prevention measures to address this issue are two-fold: (1) decreasing young people's involvement in delinquent behaviors and (2) decreasing young people's associating with peers who are involved in illicit behaviors. It would also be important to see whether parental monitoring, an aspect of parent-child relationships not explored in this study, decreases the prominent effect of delinquent friends.

The effect of romantic partnerships on violence trajectories is sensitive to timing and also specific to trajectory groups. First, during adolescence being in a romantic partnership increases the risk of violence. Second, romantic partnerships, and specifically marriages, deter violence in early adulthood and thereafter. These findings point to the importance of being sensitive to when romantic partnerships function as risk versus protective factors.

Additionally, there is a need for future studies to examine additional facets of people's social relationships not covered in this dissertation. Moreover, a comprehensive understanding

of violence requires examination of social contexts outside of people's immediate relationships such as communities, neighborhoods, and larger structural forces that may contribute to the disproportionate concentration of violence in certain communities (Aisenberg & Herrenkohl, 2008). This last step is integral because people of color, who live in poor, densely populated urban areas experience disproportionately higher exposure to violence (Aisenberg & Herrenkohl, 2008).

6.5 CONCLUSION

This study addresses an important public health issue that affects the population at large. Violence, including the threat of violence, has a detrimental impact on people who are directly and indirectly exposed to it. In addition to lethal violence, non-lethal violence also leads to significant physical and emotional impairments and life course disruption. As such, it is a serious issue that needs to be better understood and addressed.

A significant contribution of this study is the identification of violence trajectories in adolescence into early adulthood through adulthood. These trajectories are: *low desister*, *high desister*, *chronic perpetrator*, and *late escalator*. It takes this a step further by determining trajectories of violence in males and females and considering how they are similar and different. These trajectories provided the basis to examine how complex social factors, specifically social relationships, differentiate which path people follow.

Identifying the causal processes by which social relationships act as encouragements to or deterrents of violence at varying time points between adolescence and adulthood highlights opportunities for the reduction and/or prevention of violence couched within an understanding

of what period on the life course might be more sensitive to intervention. It is important that factors that put people at increased risk of violence be diminished, while simultaneously stimulating factors that deter violence in order to break the pernicious and destructive cycle of violence, at least for some.

REFERENCES

- Agnew, R. (2003). An integrated theory of the adolescent peak in offending. *Youth & Society, 34*(3), 263-299.
- Aisenberg, E., & Herrenkohl, T. (2008). Community Violence in Context: Risk and Resilience in Children and Families. *J Interpers Violence, 23*(3), 296-315.
- Arnett, J. J. (2000). Emerging adulthood - A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480.
- Banyard, V. L., & Modecki, K. L. (2006). Interpersonal violence in adolescence - Ecological correlates of self-reported perpetration. *Journal of Interpersonal Violence, 21*(10), 1314-1332.
- Blum, J., Ireland, M., & Blum, R. W. (2003). Gender differences in juvenile violence: a report from Add Health. *Journal of Adolescent Health, 32*(3), 234-240.
- Blumstein, A., Rivara, F. P., & Rosenfeld, R. (2000). The Rise and Decline of Homicide—and Why. *Annual Review of Public Health, 21*(1), 505-541.
- Booth, J. A., Farrell, A., & Varano, S. P. (2008). Social control, serious delinquency, and risky behavior. *Crime & Delinquency, 54*(3), 423-456.
- Bottrell, D. (2009). Dealing With Disadvantage Resilience and the Social Capital of Young People's Networks. *Youth & Society, 40*(4), 476-501.
- Bottrell, D. (2009). Understanding 'Marginal' Perspectives: Towards a Social Theory of Resilience. *Qualitative Social Work, 8*(3), 321-339.
- Brendgen, M., Vitaro, F., Tremblay, R. E., & Wanner, B. (2002). Parent and peer effects on delinquency-related violence and dating violence: A test of two mediational models. *Social Development, 11*(2), 225-244.
- Bushway, S., Thornberry, T., & Krohn, M. (2003). Desistance as a Developmental Process: A Comparison of Static and Dynamic Approaches. *Journal of Quantitative Criminology, 19*(2), 129-153.
- Call, K. T., Riedel, A. A., Hein, K., McLoyd, V., Petersen, A., & Kipke, M. (2002). Adolescent health and well-being in the twenty-first century: A global perspective. *Journal of Research on Adolescence, 12*(1), 69-98.

- Centers for Disease Control. (2009). Youth Violence Facts at a Glance. In C. f. D. Control (Ed.),
Retrieved from: http://www.cdc.gov/violenceprevention/pdf/YV_DataSheet_Summer2009-a.pdf on February 2, 2010.
- Chantala, K., & Tabor, J. (2010). Strategies to perform a design-based analysis using Add Health data. Chapel Hill, NC: Carolina Population Center University of North Carolina at Chapel Hill.
- Chris Fraley, R. (2002). Attachment Stability From Infancy to Adulthood: Meta-Analysis and Dynamic Modeling of Developmental Mechanisms. *Personality and Social Psychology Review*, 6(2), 123-151.
- Chung, I.-J., Hill, K. G., Hawkins, J. D., Gilchrist, L. D., & Nagin, D. S. (2002). Childhood Predictors of Offense Trajectories. *Journal of Research in Crime and Delinquency*, 39(1), 60-90.
- Crowell, J., & Waters, E. (2005). Attachment Representations, Secure-Base Behavior, and the Evolution of Adult Relationships: The Stony Brook Adult Relationship Project. In K. E. Grossmann, K. Grossmann & E. Waters (Eds.), *Attachment from infancy to adulthood : the major longitudinal studies* (pp. 233-244). New York: Guilford Press.
- Dahlberg, L. L. (1998). Youth Violence in the United States: Major Trends, Risk Factors, and Prevention Approaches. *American Journal of Preventive Medicine*, 14(4), 259-272.
- Dahlberg, L. L., & Potter, L. B. (2001). Youth violence: Developmental pathways and prevention challenges. *American Journal of Preventive Medicine*, 20(1, Supplement 1), 3-14.
- De Coster, S., Heimer, K., & Wittrock, S. M. (2006). Neighborhood Disadvantage, Social Capital, Street Context, and Youth Violence. *Sociological Quarterly*, 47(4), 723-753.
- Demuth, S., & Brown, S. L. (2004). Family Structure, Family Processes, and Adolescent Delinquency: The Significance of Parental Absence Versus Parental Gender. *Journal of Research in Crime and Delinquency*, 41(1), 58-81.
- Dishion, T. J., Eddy, J. M., Haas, E., Li, F., & Spracklen, K. (1997). Friendships and Violent Behavior During Adolescence. *Social Development*, 6(2), 207-223.
- Dominguez, S., & Arford, T. (2010). It is all about who you know: Social capital and health in low-income communities. *Health Sociology Review*, 19(1), 114-129.
- Earls, F., & Carlson, M. (2001). The social ecology of child health and well-being. *Annual Review of Public Health*, 22, 143-166.

- Elder, G. H., Johnson, M. K., & Crosnoe, R. (2003). The Emergence and Development of Life Course Theory. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the Life Course* (pp. 3-19): Springer US.
- Elliott, D. S., Huizinga, D., & Morse, B. (1986). Self-Reported Violent Offending. *Journal of Interpersonal Violence, 1*(4), 472-514.
- Englander, E. K. (2007). *Understanding violence* (3rd ed.). Mahwah, N.J.: Lawrence Erlbaum Associates.
- Fergus, S., & Zimmerman, M. A. (2004). Adolescent Resilience: A Framework for Understanding Healthy Development in the Face of Risk. *Annual Review of Public Health, 26*(1), 399-419.
- Gecas, V. (2003). Self-Agency and the Life Course. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the Life Course* (pp. 369-388): Springer US.
- Gerard, J. M., & Buehler, C. (2004a). Cumulative Environmental Risk and Youth Maladjustment: The Role of Youth Attributes. *Child Development, 75*(6), 1832-1849.
- Gerard, J. M., & Buehler, C. (2004b). Cumulative Environmental Risk and Youth Problem Behavior. *Journal of Marriage and Family, 66*(3), 702-720.
- Grossmann, K., Grossmann, K. E., & Kindler, H. (2005). Early Care and the Roots of Attachment and Partnership Representations. In K. E. Grossmann, K. Grossmann & E. Waters (Eds.), *Attachment from infancy to adulthood : the major longitudinal studies* (pp. 98-136). New York: Guilford Press.
- Hagan, J., & Foster, H. (2001). Youth Violence and the End of Adolescence. *American Sociological Review, 66*(6), 874-899.
- Harris, K. M. (2011). *Design Features of Add Health*
- Haviland, A., & Nagin, D. (2005). Causal inferences with group based trajectory models. *Psychometrika, 70*(3), 557-578.
- Hawkins, D. F., Laub, J. J., Lauritsen, J., & Cothorn, L. (2000). Race, ethnicity and serious and violent juvenile offending. Washington, D.C.: US DOJ, OJJDP, NCJ.
- Haynie, D. L., & Payne, D. C. (2006). Race, friendship networks, and violent delinquency. *Criminology, 44*(4), 775-805.

- Haynie, D. L., Petts, R. J., Maimon, D., & Piquero, A. R. (2009). Exposure to Violence in Adolescence and Precocious Role Exits. *Journal of Youth and Adolescence*, 38(3), 269-286.
- Haynie, D. L., Silver, E., & Teasdale, B. (2006). Neighborhood characteristics, peer networks, and adolescent violence. *Journal of Quantitative Criminology*, 22(2), 147-169.
- Henry, D. B., Tolan, P. H., & Gorman-Smith, D. (2001). Longitudinal Family and Peer Group Effects on Violence and Nonviolent Delinquency. *Journal of Clinical Child & Adolescent Psychology*, 30(2), 172 - 186.
- Herrenkohl, T. I., Maguin, E., Hill, K. G., Hawkins, J. D., Abbott, R. D., & Catalano, R. F. (2000). Developmental risk factors for youth violence. *Journal of Adolescent Health*, 26(3), 176-186.
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.
- Hirschi, T., & Gottfredson, M. R. (2000). In defense of self-control. *Theoretical Criminology*, 4(1), 55-69.
- Ingram, J. R., Patchin, J. W., Huebner, B. M., McCluskey, J. D., & Bynum, T. S. (2007). Parents, Friends, and Serious Delinquency. *Criminal Justice Review*, 32(4), 380-400.
- Jones, B. L., & Nagin, D. S. (2007). Advances in group-based trajectory modeling and an SAS procedure for estimating them. *Sociological Methods & Research*, 35(4), 542-571.
- Jones, B. L., & Nagin, D. S. (2012). *A Stata Plugin for Estimating Group-Based Trajectory Models*.
- Jones, B. L., Nagin, D. S., & Roeder, K. (2001). A SAS procedure based on mixture models for estimating developmental trajectories. *Sociological Methods & Research*, 29(3), 374-393.
- Kaufman, J., Crusto, C., Quan, M., Ross, E., Friedman, S., O'Rielly, K., & Call, S. (2006). Utilizing Program Evaluation as a Strategy to Promote Community Change: Evaluation of a Comprehensive, Community-Based, Family Violence Initiative. *American Journal of Community Psychology*, 38(3), 191-200.
- Kaufman, J. M. (2005). Explaining the race/ethnicity–violence relationship: Neighborhood context and social psychological processes. *Justice Quarterly*, 22(2), 224 - 251.
- Lansford, J. E., Miller-Johnson, S., Berlin, L. J., Dodge, K. A., Bates, J. E., & Pettit, G. S. (2007). Early physical abuse and later violent delinquency: A prospective longitudinal study. *Child Maltreatment*, 12(3), 233-245.

- Laub, J. H., & Sampson, R. J. (1993). Turning points in the life-course – Why change matters to the study of crime. *Criminology*, 31(3), 301-325.
- Leiber, M. J., Mack, K. Y., & Featherstone, R. A. (2009). Family Structure, Family Processes, Economic Factors, and Delinquency Similarities and Differences by Race and Ethnicity. *Youth Violence and Juvenile Justice*, 7(2), 79-99.
- Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology*, 48, 371-410.
- Loeber, R., & Southamer-Loeber, M. (1998). Development of juvenile aggression and violence: Some common misconceptions and controversies. *The American Psychologist*, 53(2), 242-259.
- Long, J. S., & Freese, J. (2006). *Regression Models for Categorical Dependent Variables Using Stata* (Second Ed. ed.). College Station, TX: Stata Press.
- Macmillan, R., & Hagan, J. (2004). Violence in the transition to adulthood: Adolescent victimization, education, and socioeconomic attainment in later life. *Journal of Research on Adolescence*, 14(2), 127-158.
- Maney, D. W., Vasey, J. J., Mahoney, B. S., Gates, S. C., & Higham-Gardill, D. A. (2004). The Tobacco-Related Behavioral Risks of a Nationally Representative Sample of Adolescents. *American Journal of Health Studies*, 19(2), 71.
- Marcus, R. F. (2009). Cross-Sectional Study of Violence in Emerging Adulthood. *Aggressive Behavior*, 35(2), 188-202.
- Massoglia, M., & Uggen, C. (2010). Settling Down and Aging Out: Toward an Interactionist Theory of Desistance and the Transition to Adulthood. *American Journal of Sociology*, 116(2), 543-582.
- McCord, J. (1991). Family Relationships, Juvenile Delinquency, and Adult Criminality. *Criminology*, 29(3), 397-417.
- McNulty, T. L., & Bellair, P. E. (2003a). Explaining racial and ethnic differences in adolescent violence: Structural disadvantage, family well-being, and social capital. *Justice Quarterly*, 20(1), 1 - 31.
- McNulty, T. L., & Bellair, P. E. (2003b). Explaining racial and ethnic differences in serious adolescent violent behavior. *Criminology*, 41(3), 709-748.

- Mirowsky, J. (2013). Analyzing Associations Between Mental Health and Social Circumstances. In C. S. Aneshensel, J. C. Phelan & A. Bierman (Eds.), *Handbook of the Sociology of Mental Health* (2nd ed., pp. 143-165): Springer US.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, *100*(4), 674-701.
- Moffitt, T. E., Caspi, A., Harrington, H., & Milne, B. J. (2002). Males on the life-course-persistent and adolescence-limited antisocial pathways: Follow-up at age 26 years. *Development and Psychopathology*, *14*(01), 179-207.
- Molnar, B. E., Roberts, A. L., Browne, A., Gardener, H., & Buka, S. L. (2005). What girls need: recommendations for preventing violence among urban girls in the US. *Social Science & Medicine*, *60*(10), 2191-2204.
- Nagin, D. S. (2005). *Group-Based Modeling of Development*. Cambridge, Massachusetts: Harvard University Press.
- Nagin, D. S., & Land, K. C. (1993). Age, Criminal Careers, and Population Heterogeneity - Specification and Estimation of a Nonparametric, Mixed Poisson Model. *Criminology*, *31*(3), 327-362.
- National Center for Injury Prevention and Control (U.S.). (2010). *Understanding youth violence fact sheet* Retrieved from <http://purl.access.gpo.gov/GPO/LPS126195>
- Petts, R. J. (2009). Family and Religious Characteristics' Influence on Delinquency Trajectories from Adolescence to Young Adulthood. *American Sociological Review*, *74*(3), 465-483.
- Piquero, A. R. (2008). Taking Stock of Developmental Trajectories of Criminal Activity over the Life Course. In A. M. Liberman (Ed.), *The Long View of Crime: A Synthesis of Longitudinal Research* (pp. 23-78): Springer New York.
- Piquero, A. R., Carriaga, M. L., Diamond, B., Kazemian, L., & Farrington, D. P. (2012). Stability in aggression revisited. *Aggression and Violent Behavior*, *17*(4), 365-372.
- Piquero, A. R., Farrington, D. P., & Blumstein, A. (2003). The Criminal Career Paradigm. *Crime and Justice*, *30*, 359-506.
- Powell, D., Perreira, K. M., & Harris, K. M. (2010). Trajectories of Delinquency From Adolescence to Adulthood. *Youth & Society*, *41*(4), 475-502.

- Ranson, K. E., & Urichuk, L. J. (2008). The effect of parent-child attachment relationships on child biopsychosocial outcomes: a review. *Early Child Development & Care, 178*(2), 129-152.
- Reese, L. R. E., Vera, E. M., Simon, T. R., & Ikeda, R. M. (2000). The Role of Families and Care Givers as Risk and Protective Factors in Preventing Youth Violence. *Clinical Child and Family Psychology Review, 3*(1), 61-77.
- Reingle, J. M., Jennings, W. G., Lynne-Landsman, S. D., Cottler, L. B., & Maldonado-Molina, M. M. (2013). Toward an Understanding of Risk and Protective Factors for Violence Among Adolescent Boys and Men: A Longitudinal Analysis. *Journal of Adolescent Health, 52*(4), 493-498.
- Resnick, M. D., Ireland, M., & Borowsky, I. (2004). Youth violence perpetration: What protects? What predicts? Findings from the National Longitudinal Study of Adolescent Health. *Journal of Adolescent Health, 35*(5), 424.e421-424.e421.
- Rew, L., & Horner, S. D. (2003). Youth resilience framework for reducing health-risk behaviors in adolescents. *Journal of Pediatric Nursing, 18*(6), 379-388.
- RÖNkÄ, A., Oravala, S., & Pulkkinen, L. E. A. (2002). "I met this wife of mine and things got onto a better track" Turning points in risk development. *Journal of Adolescence, 25*(1), 47-63.
- Sampson, R. J., & Laub, J. H. (2003). Life-course Desisters? Trajectories Of Crime Among Delinquent Boys Followed to Age 70. *Criminology, 41*(3), 555-592.
- Sampson, R. J., & Laub, J. H. (2005). A life-course view of the development of crime. *Annals of the American Academy of Political and Social Science, 602*, 12-45.
- Sampson, R. J., Morenoff, J. D., & Raudenbush, S. (2005). Social Anatomy of Racial and Ethnic Disparities in Violence. *Am J Public Health, 95*(2), 224-232.
- Schulenberg, J. E., Maggs, J. L., & O'Malley, P. M. (2003). How and Why the Understanding of Developmental Continuity and Discontinuity is Important. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the Life Course* (pp. 413-436): Springer US.
- Shanahan, M. J. (2000). Pathways to adulthood in changing societies: Variability and mechanisms in life course perspective. *Annual Review of Sociology, 26*, 667-692.
- Shetgiri, R., Kataoka, S., Ponce, N., Flores, G., & Chung, P. J. (2010). Adolescent Fighting: Racial/Ethnic Disparities and the Importance of Families and Schools. *Academic Pediatrics, 10*(5), 323-329.

- Sieving, R. E., Beuhring, T., Resnick, M. D., Bearinger, L. H., Shew, M., Ireland, M., & Blum, R. W. (2001). Development of adolescent self-report measures from the National Longitudinal Study of Adolescent Health. *Journal of Adolescent Health, 28*(1), 73-81.
- Simons-Morton, B. G., Hartos, J. L., & Haynie, D. L. (2004). Prospective analysis of peer and parent influences on minor aggression among early adolescents. *Health Education & Behavior, 31*(1), 22-33.
- Smith, P., Flay, B. R., Bell, C. C., & Weissberg, R. P. (2001). The Protective Influence of Parents and Peers in Violence Avoidance Among African-American Youth. *Maternal and Child Health Journal, 5*(4), 245-252.
- Sokol-Katz, J., & Dunham, R. (1997). Family structure versus parental attachment in controlling adolescent deviant behavior: A social. *Adolescence, 32*(125), 199-199.
- Sommers, I., & Baskin, D. R. (1994). Factors Related to Female Adolescent Initiation Into Violent Street Crime. *Youth & Society, 25*(4), 468-489.
- Steele, H., & Steele, M. (2005). Understanding and Resolving Emotional Conflict: The London Parent-Child Project. In K. E. Grossmann, K. Grossmann & E. Waters (Eds.), *Attachment from infancy to adulthood : the major longitudinal studies* (pp. 137-164). New York: Guilford Press.
- Steffensmeier, D., Schwartz, J., Zhong, H., & Ackerman, J. (2005). An assessment of recent trends in girls' violence using diverse longitudinal sources: Is the gender gap closing? *Criminology, 43*(2), 355-405.
- Stouthamer-Loeber, M., Wei, E., Loeber, R., & Masten, A. S. (2004). Desistance from persistent serious delinquency in the transition to adulthood. *Development and Psychopathology, 16*(4), 897-918.
- Stroufe, L. A., Egeland, B., Carlson, E., & Collins, W. A. (2005). Placing Early Attachment Experiences in Developmental Context: The Minnesota Longitudinal Study. In K. E. Grossmann, K. Grossmann & E. Waters (Eds.), *Attachment from infancy to adulthood : the major longitudinal studies* (pp. 48-70). New York: Guilford Press.
- Sugimoto-Matsuda, J. J., Hishinuma, E. S., Momohara, C. B. K., Rehuher, D., Soli, F. M., Bautista, R. P. M., & Chang, J. Y. (2012). Monitoring the Multi-Faceted Problem of Youth Violence: The Asian/Pacific Islander Youth Violence Prevention Center's Surveillance System. *Journal of Community Health, 37*(5), 1015-1025.
- Uhlenberg, P., & Mueller, M. (2003). Family Context and Individual Well-Being. In J. T. Mortimer & M. J. Shanahan (Eds.), *Handbook of the Life Course* (pp. 123-148): Springer US.

United States. Public Health Service. Office of the Surgeon General. (2001). *Youth violence : a report of the Surgeon General*. Washington, D.C.: Dept. of Health and Human Services
For sale by the U.S. G.P.O., Supt. of Docs.

WHO. (2002). *World report on violence and health: summary*. Geneva.

Winett, L. B. (1998). Constructing violence as a public health problem. *Public Health Rep*, 113(6), 498-507.