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Criminal predictors and protective factors in a sample of young offenders : relationship to offending trajectories

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CRIMINAL PREDICTORS AND PROTECTIVE FACTORS IN A SAMPLE OF YOUNG
OFFENDERS: RELATIONSHIP TO OFFENDING TRAJECTORIES

by

Ashley Ward

Bachelor of Science in Psychology, Nipissing University, North Bay, Ontario 2007

A thesis

presented to Ryerson University

in partial fulfillment of the

requirements for the degree of

Master of Arts

in the Program of

Psychology

Toronto, Ontario, Canada 2009

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Author's Declaration

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Abstract

Criminal Predictors and Protective Factors in a Sample of Young Offenders: Relationship to Offending Trajectories

Ashley Ward

Master of Arts in the Program of Psychology, 2009

Ryerson University

Although the predictors of delinquency are well-documented in the psychological and criminological literature, an understanding of their relationship with longitudinal criminality in an offender sample has not been achieved. The purpose of this thesis was to examine the relationship between childhood and adolescent criminal predictors and protective factors and the four criminal trajectories identified by Day et al. (2008). Results revealed differences in predictor items among the trajectory groups within the individual, family, and peer domains during childhood and adolescence. A backward stepwise procedure found that the following childhood variables, broken home and involvement with alternative care, differentiated the low rate trajectory group from the other three groups. Significant predictors in adolescence were criminal family members, familial abuse, poor peer relations, broken home, and involvement with alternative care. Identifying the factors influencing the onset and maintenance of criminality can inform prevention and intervention programs that target antisocial and delinquent behaviour.

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Dedication

I would like to dedicate this thesis to my mother, who always believed in me.

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Introduction

The occurrence of crime is associated with a number of negative individual, social, and economic consequences (Conklin, 1975). The individual costs of crime incurred by the victim may include physical injury, psychological trauma, and fear of crime, while society as a whole experiences heightened feelings of insecurity. Youth who engage in delinquency and antisocial behaviour are at risk for various short- and long-term negative consequences, such as psychiatric problems, early and severe alcohol and/or substance use and abuse, school failure and dropout, adult criminal behaviour, low occupational status and low income, unemployment, poor marital adjustment and stability, and impaired offspring (Jessor, 1998; Perry, 2000; Werner & Smith, 1992). Crime's enormous impact on the economy extends from the costs of the offences themselves to the responses to criminal activity, such as police intervention, court proceedings, and the application of correctional and rehabilitative measures. The total number of federal stays in Canada in 2003 was approximately \$4,626,606 (CAD), while the average daily cost of each inmate was \$240.18 (CAD) (Canadian Centre for Justice Statistics, 2005). The average individual cost of non-fatal pain and suffering from crime victimization is \$72,000 (CAD) (Leung, 2004).

For a certain number of individuals who offend, crime is not a one-time event, nor is it limited to one type of offence or a constant frequency of engagement. Longitudinal studies completed in Canada, the United States, Puerto Rico, Scotland, England, Denmark, Sweden, Finland, Switzerland, China, Australia, New Zealand, and Japan, using community, high risk, and offender samples, have provided strong support for the continuity and variability of criminal behaviour over the life course (Piquero, 2008). Insight into the study of offending across development also has been gained using the trajectory analysis procedure, which accommodates

the changes and continuities of offending through the use of a group-based framework (Nagin, 1999; Piquero). This methodology assumes that distinct groups of offenders (e.g., low rate, moderate rate, and high rate) exist within the aggregated age-crime curve, which results from the influence of different factors (e.g., biological, individual, familial, peer, situational) at different developmental stages of the life course. The results of studies utilizing the trajectory analysis method have identified significant distinctions among groups of offenders, and mounting research evidence supports the notion that certain factors occurring at specific developmental periods differentiate the offending groups. Discovering the factors in childhood and adolescence linked to the onset and maintenance of criminal behaviour and their effects at different developmental stages is of great interest to researchers, policy makers, and the general public, given their implications for the prevention and intervention of antisocial behaviour and delinquency. For example, Cohen and Piquero (2009) estimated that the financial cost saved by effectively intervening on the antisocial behaviour of a 14-year-old high risk adolescent is estimated to be between \$2.6 to \$5.3 million (USD).

At the present time, the factors in childhood and adolescence related to the onset of delinquency are well-documented in the psychological and criminological literature, using both cross-sectional and prospective longitudinal designs (Borum, 2000; Farrington, 2004; Farrington & Welsh, 2007; Hawkins et al., 1998; Leschied, Chiodo, Nowicki, & Rodger, 2008; Lipsey & Derzon, 1998). What is missing, however, is an understanding of the relationship between the factors linked to the onset and maintenance of offending and patterns of criminal behaviour *across the life course*. While some research has examined this association in community and high risk samples, few studies have utilized an offender-based population. Additionally, little is known about the influence of protective factors on longitudinal criminality, an area of focus that

has been understudied in criminal trajectory research. The aim of this thesis was to expand on the body of knowledge about the relationship between criminal predictors and protective factors and offending trajectories using the four trajectory groups identified by Day, Bevc, Theodor, Rosenthal, and Duchesne (2008).

Organization of the Thesis

The current thesis is divided into four main sections. The first section introduces the area of developmental criminology and broadly reviews the psychological and criminological literature on the causes and correlates of criminal behaviour in childhood and adolescence. Factors that have been found to prevent or reduce engagement in antisocial behaviour and delinquency also are reviewed, and an overview of the notion of the criminal trajectory is provided. The precursor study of this thesis, authored by Day et al. (2008), is briefly described and the results of their criminal trajectory analysis are summarized. Also, the anticipated outcomes of the current study are outlined. The second section describes the study's design and rationale, characteristics of the sample, and the procedures followed for data collection. The plan of analysis is then discussed. The third section provides the results of the analyses, including hypothesis testing and exploratory analyses. The fourth section of this document reviews the study's findings in the context of the broader literature, as well as the limitations of the study, policy and practice implications, and future directions for research in the field. The coding schemes used to code the data are found in Appendices A through D following the fourth section of the thesis.

Developmental Criminology

Developmental criminology is defined by three key issues: 1) the development of antisocial and offending behaviour; 2) the risk factors for antisocial and offending behaviour at

different ages; and 3) the influence of life events on development (Loeber & LeBlanc, 1990; LeBlanc & Loeber, 1998; Farrington, 2006). Understanding the developmental characteristics of offending, such as the age of onset, frequency, prevalence, specialization across age groups, and desistance from criminal activity, is of interest. Studying within-individual changes over time is emphasized (Loeber et al., 1993) as it is believed that the factors related to criminal behaviour change according to an individual's stage of development. For example, hyperactivity and impulsivity may motivate a child of age 7 to shoplift, but, some years later, at the age of 26, the same individual may commit burglary out of a need for money to purchase alcohol or drugs.

Engagement in crime is considered to be part of a larger syndrome of antisocial behaviour that begins in childhood and continues throughout adolescence and adulthood (West & Farrington, 1977). Empirical evidence has shown that there is strong continuity in antisocial behaviour across time, with the behavioural expressions of antisociality changing according to the individual's capacities and environmental contexts (Farrington, 1990, 2006). Of interest to many researchers is answering the question of whether there are different trajectories of offending that these individuals follow and whether these trajectories are related to specific factors occurring early in life.

Developmental criminology seeks to identify the factors at different ages that relate to criminal behaviour. Generally, the factors are classified within the biological, individual, family, peer, school, neighbourhood and community, and situational domains (Farrington, 2006). The factors within the individual, family, peer, and school domains will be reviewed and described in a later section of the literature review. The results of research on the impact of these factors on delinquency have been consistent, regardless of whether the outcome measure was officially recorded or self-reported delinquency (Farrington, 1992), and the risk factors for offending have

been replicated using cross-sectional and prospective longitudinal designs (Borum, 2000; Leschied et al., 2008).

There appears to be a cumulative effect of risk, independent of the type of risk factors involved. That is, the greater the number of risk factors present in an offender's life, the more likely his criminal behaviour is to persist (Farrington, 2002). As well, children who experience several disruptions in their development are at risk for stable and persistent involvement in the youth and adult criminal justice systems (Leschied et al., 2008). However, it is important to note that, while the presence of certain factors may have greater predictive power than others, the presence of even the strongest factors are not so certain that all youth who have one or some of these factors will engage in delinquent behaviour. Additionally, recent research has discovered that specific factors present at certain developmental periods influence the likelihood and type of offending. Understanding the factors that influence the onset and maintenance of antisociality and delinquency at each developmental stage is important for the advancement of effective prevention and intervention programs that reduce the likelihood of antisocial and delinquent outcomes. An understanding of the factors protecting against antisociality and delinquency also may be useful for designing prevention and intervention models since the effects of these factors remain unclear at this time.

Predictors of Delinquency in Childhood and Adolescence

At present, the causes and correlates (collectively termed "predictors" for the purpose of this thesis) linked to the onset and maintenance of delinquency, occurring in childhood and adolescence, are well-documented in the psychological and criminological literature (Borum, 2000; Farrington, 2004; Farrington & Welsh, 2007; Hawkins et al., 1998; Howell, 1997; Leschied et al., 2008; Lipsey & Derzon, 1998; Loeber & Stouthamer-Loeber, 1998; Rutter,

Giller, & Hagell, 1998). Prospective longitudinal studies are particularly important in this line of research, as they follow infants or young children into their adult years to precisely measure the changes in relationships between predictors and criminal behaviour. The predictors occurring in childhood and adolescence that play a role in the onset and maintenance of delinquent behaviour are found within the domains of the individual, family, peer, and school. Predictors within the neighbourhood and community and situational domains are important to consider when contextualizing delinquency; however, these factors are not reviewed as they were not measured in the current study.

Individual factors. Individual factors in childhood and adolescence that have been found to influence delinquency are low intelligence, measured using a low verbal, nonverbal, or overall IQ score or a learning disability, and school problems including low academic achievement, low interest in education, dropout, and academic difficulties (Farrington, 1989; Lipsitt, Buka, & Lipsitt, 1990; Maguin & Loeber, 1996; Stattin & Klackenber-Larsson, 1993). Hyperactive-impulsive-inattentive behaviours, such as attention or concentration deficits, attention deficit disorder, and hyperactivity, have been implicated in the development of delinquency (Barkley, Fischer, Edelbrock, & Smallish, 1990; Blackburn, 1993; Pratt, Cullen, Blevins, Daigle, & Unnever, 2002; Satterfield, Hoppe, & Schell, 1982; Satterfield & Schell, 1997), as well as substance use (Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1987; Dembo et al., 1995) and antisocial overt (e.g., aggression, bullying) and covert (e.g., animal cruelty, vandalism, break and enter) behaviours (Farrington, 1991; Tremblay, Masse, Vitaro, & Dobkin, 1995; White, Moffitt, Earls, Robins, & Silva, 1990). The onset of antisocial behaviour between the ages of 10 and 12 years is strongly predictive of a lengthy and diverse pattern of criminal behaviour (Loeber & Farrington, 1998). Callousness traits, such as a lack of guilt or remorse,

low empathy, and shallow emotions, have predicted antisocial and delinquent behaviour (Barry et al., 2000; Hill, 2003).

Family factors. The psychological and criminological literature has linked a number of family-related factors occurring in childhood to subsequent delinquency (Arseneault, Tremblay, Boulerice, Seguin, & Saucier, 2000; Herrera & McCloskey, 2001; Juby & Farrington, 2001). Having an antisocial or a criminal parent or sibling, or having a parent with an addiction or other mental health problem, are two important predictors of delinquency and violence (Farrington, 1989; Farrington, Barnes, & Lambert, 1996; McCord, 1977). Familial relationship difficulties, characterized by discord, low levels of communication, and poor bonding, as well as inappropriate child-rearing methods such as poor supervision, harsh and punitive, lax, or inconsistent discipline, have been implicated in adolescent criminality (Capaldi & Patterson, 1996; Elliott, 1994; Farrington & Welsh, 2007; Hawkins, Arthur, & Catalano, 1995; McCord). Children and adolescents who have been physically, sexually, or verbally abused or neglected are at a high risk for criminal behaviour (Malinosky-Rummell & Hansen, 1993; Smith & Thornberry, 1995; Widom, 1989). Broken homes, family transitions, or disrupted families, have been found to have a causal relationship with delinquency (Farrington, 1992; McCord, 1982), as well as frequent changes in parent figures (Capaldi & Patterson, 1991; Mednick, Baker, & Carothers, 1990), and mothers aged 17 or younger at the time of childbirth (Loeber, Farrington, Stouthamer-Loeber, & van Kammen, 1998).

Peer factors. In addition to the above-noted family factors, peer factors are among some of the strongest predictors of delinquency, particularly in adolescence (Brendgen, Vitaro, & Bukowski, 1998; Farrington & West, 2007; Moffitt, 1993). These include peer rejection, low popularity and difficulty relating to peers (Coie, Lochman, Terry, & Hyman, 1992; DeRosier,

Kupersmidt, & Patterson, 1994), and negative or criminal peer association (Dishion & Loeber, 1985; Elliott, Huizinga, & Ageton, 1985; Patterson & Dishion, 1985).

School factors. According to Maguin and Loeber (1996), a lack of interest in academics, truancy, suspensions, and expulsions have been linked to the development of criminal behaviour. Adolescents with a high frequency of discipline problems at school have been found to engage in delinquent behaviour (Loeber & Farrington, 1998). As well, youth who drop out of school have been found to be at high risk for delinquency (Fagan & Pabon, 1990; Fagan, Piper, & Moore, 1986; Farrington, 1989; Wolfgang, Thornberry, & Figlio, 1987).

Protective Factors

Successfully prevailing over adversity is broadly termed as resilience (Masten, Best, & Garmezy, 1990; Rutter, 1987). As such, resiliency includes risk factors and factors that protect against risk. Protective factors are “individual characteristics or environmental conditions that help children and youth resist or otherwise counteract the risks to which they are exposed” (Richman & Fraser, 2001, p. 4). They delay, suppress, or neutralize negative outcomes such as antisociality and delinquency (Benard, 1991; Kirby & Fraser, 1997; Rutter) by exerting compensatory or buffering effects on the factors associated with offending (Fraser, Richman, & Galinsky, 1999).

While some researchers have defined factors as either purely related to risk or protection, others refer to them as opposite poles of the same variable (Stouthamer-Loeber et al., 1993; White, Moffitt, & Silva, 1989). Farrington (1992) suggested that, rather than simply being opposing ends of a spectrum, risk and protective variables may differ in terms of the magnitude of their relationship to an outcome. In support of this notion, Stouthamer-Loeber et al. found that some variables of study were more likely to show risk and protective influences than either

concept alone, while others exerted a risk-specific effect only. Protective and risk variables did not have a uniform effect across different levels of delinquency. For the purpose of this thesis, four domains of protective factors will be reviewed: individual, familial, peer, and school.

Individual factors. Intellectual ability has been one of the most salient protective factors in the literature, with average to high IQ benefitting children at risk for maladaptive outcomes (Werner, 1986; White et al., 1989). Effectively structuring a child's leisure time with prosocial activities and hobbies can act as a protective mechanism (Jenkins & Smith, 1990), particularly activities for which the child receives positive recognition for. Emotional stability and social maturity also are important individual protective factors (Carr & Vandiver, 2001; Stattin, Romelsjo, & Stenbacka, 1997), as well as efficient use of problem-solving skills and self-reliance (Parker, Cowen, Work, & Wyman, 1990). Additionally, a positive response to authority has been linked to lower levels of delinquency (Hoge, Andrews, & Leschied, 1996).

Family factors. Children who grow up in cohesive families and who have good communication with their parents have displayed good adaptation in adolescence (Grossman et al., 1992). As well, the presence of supportive and nurturant relationships with at least one parent has been shown to ameliorate the effects of adversity (Fergusson & Lynskey, 1996; Werner, 1989).

Peer and school factors. Positive peer relations, including positive associations with and being well-liked among peers, are an important source of protection for children at risk. School-based competencies, such as conduct, sociability, and good academic achievement, have shown protective effects (Cowen & Work, 1988; Rutter, 1985; Werner, 1989). For example, Werner (1993) illustrated that children who had normative achievement in communication in elementary school had nurturant, responsible, and achievement-oriented attitudes in adolescence.

Criminal Trajectories: The Criminal Career

The term “developmental trajectory” has been used to describe the course of a behaviour or outcome over the life course (Nagin & Tremblay, 2005). The notion of the criminal trajectory, or criminal career, relates to “the longitudinal sequence of offences committed by an offender who has a detectable rate of offending during some period” (Blumstein, Cohen, & Farrington, 1988, p. 2). The general definition of the term “career” is described by two specific concepts, including a course in progress through life and a way of making a living. In terms of delinquent behaviour, “career” refers to the succession of criminal offending during a period of an individual’s life. This should not suggest that the offender earns a living through his criminal behaviour, though some may engage in criminal activity as a means for survival (Blumstein et al., 1988). All criminal trajectories have an onset, a termination, and a total career length. During the period of time from onset to termination, it is important to determine the characteristics of the career, such as the rate of offending and patterns of offence types.

Onset. Thornberry (2005) described offending as a commonplace trait; that is, more individuals than not within the population are inclined to, and partake in, delinquent behaviour at some point in their lives. Generally, this behaviour is thought to occur in adolescence (Moffitt, 1993). While many individuals engage in some degree of criminal behaviour, the majority will not involve themselves in a lengthy or substantial criminal career. This has been illustrated when criminal trajectory features such as frequency, duration, seriousness, and an interaction of all of these factors, are examined (Thornberry). Therefore, few individuals will persist in committing crimes. The onset of a criminal career may occur in childhood, adolescence, or adulthood.

Course. There is a range of possible criminal careers that offenders could experience during their active offending periods. Some careers will be limited in type of offending, or

specialize, while others will display flexibility, or versatility, in committing crimes. Farrington (1999) found that offenders primarily engage in versatile rather than specialized offending, particularly in adolescence. Those partaking in a longer criminal career may involve frequent offending while others commit crimes in fewer numbers (Thornberry, 2005). Given the predominance of heterogeneity in offending behaviour, individual patterns of offending are not well represented by the age-crime curve, although it is implied in some theories of criminality. For example, Gottfredson & Hirschi (1990) argue that low self-control is the lone risk factor that explains crime at all ages. Regardless of the criminal career trajectory, however, it should be noted that, despite the various patterns an individual's career could display, the pathway is not random. Developmental life events, such as getting married or gaining employment, impact the shape and length of the criminal career.

Desistance. Research on criminal trajectories suggests that, after a period of time, the majority of offenders desist from criminal activity and that this inactivity is stable (Thornberry, 2005). Desistance is generally comprised of two developmentally-related processes. The first process involves a decreasing participation from the peak level of criminal activity to the beginning of criminal inactivity, while the second process consists of the maintenance of noncriminal activity at a zero or near-zero rate (Thornberry). Termination may occur abruptly or gradually, though the latter behaviour is more prevalent. Further, although there is a high likelihood for those who begin criminal activity sooner in life to desist from offending behaviour later rather than sooner, it is possible for some to desist earlier and faster.

How many criminal trajectories are there? The question of the number of distinct offence trajectories remains a matter of debate in the literature (D'Unger, Land, McCall, & Nagin, 1998; Tolan & Gorman-Smith, 1998). Key researchers in the field have proposed two-

group (Moffitt, 1993; Patterson & Yoerger, 1993), three-group (Livingston, Stewart, Allard, & Oglivie, 2008), four-group (D'Unger et al., 1998; Blokland, Nagin, & Nieuwbeerta, 2005), five-group (Wiesner & Capaldi, 2003), and eight-group (Thornberry, Huizinga, & Loeber, 2004) models. In the Toronto criminal career study, Day et al. (2008) have identified a four-group model that includes moderate rate, low rate, high rate adult-peaked, and high rate adolescence-peaked offending groups. This study and the trajectory groups are subsequently described.

The Toronto Criminal Career Study

Day et al. (2008) investigated the nature and pattern of offending in a sample of male young offenders. The study analyzed for changes and continuities in offending across adolescence and early adulthood and examined the relationship between crime-related events in adolescence (e.g., rate of offending, receiving a custody disposition) and the rate of offending in adulthood.

Sample characteristics. The sample consisted of 378 male young offenders who were sentenced to one of two Phase II open custody facilities operated by a children's mental health centre in Toronto, Ontario, Canada. This was a 50% random selection of all of the young offenders who resided at both facilities between January 22, 1986 and April 22, 1996. The Toronto sample served a mean of 124.6 days ($SD = 109.8$, Median = 92, Mode = 122, range = 1 – 1,087) in open custody, and the majority of the youths were within a range of 16 and 18 years of age (94.2%; $M = 17.6$, $SD = .85$, range = 16.1 – 24.4 years) at the time of their admission into one of the open custody facilities. This sentence was not the first open or secure custodial placement for approximately one quarter of the sample (26.7%).

Criminal offence data. The sample's criminal offence data were extracted from four official sources of information, including the Ontario Ministry of Community and Social

Services (MCSS), the Ontario Ministry of Correctional Services (MCS), the Canadian Police Information Centre (CPIC), and predisposition or presentencing reports on file at the children's mental health centre. A coding scheme was created to record detailed information about the dimensions of their criminal careers, including the rate, type, severity, versatility, and duration of offending. Types of court contacts that were included in the study were: 1) those that resulted in a conviction and disposition (e.g., secure or open custody, fine, etc.), including a suspended sentence; 2) those that resulted in a finding of guilt but not a conviction (e.g., absolute or conditional discharge); and 3) those that resulted in either a withdrawal of charges, stay of proceedings, or determination that the person was unfit to stand trial (e.g., due to cognitive competence). Court contact that resulted in a withdrawal of charges accounted for only 5.7% of the total number of court contacts. The sample's court contacts were tracked for an average of 12.1 years ($SD = 3.0$, range = 4.9 – 22.8), beginning in late childhood or early adolescence and continuing into adulthood, with 73% of the sample followed for a minimum of 10 years. The Toronto sample was, on average, 27.6 years of age at the time of the last follow-up ($SD = 2.6$, range = 22.2 – 33.5 years).

The four-group model. The trajectory analysis identified four unique groups of offenders. The first group, labeled the moderate rate (MR) group, comprised 21.7% of the total sample. Their criminal career was an average of 12.0 years in length. The group's average age of first court contact was 15.1 years, and, at the time of their last court contact, their average age was 27.1 years. The average number of court contacts (corrected for time-at-risk) accumulated by the MR group was 7.6 in adolescence and 23.6 in adulthood, averaging 31.2 court contacts across their entire criminal career. Members of this group spent an average of 3.7 years in closed

custody. Additionally, compared to the other three groups, they accumulated the greatest number of drug offenses, such as trafficking and possession.

The second group, the low rate (LR) group, comprised 65.1% of the total sample. This group had the shortest criminal career length compared to the other three groups, lasting only 6.7 years. Their average age of first court contact was 15.9 years, and their average age at the time of their last court contact was 22.5 years. This group incurred the least amount of (corrected) court contacts in adolescence ($M = 4.5$) and adulthood ($M = 4.8$) and engaged in the fewest types of offences. This group spent an average of less than one year ($M = .9$) in closed custody. It is interesting to note that this group had the greatest average number of psychiatric disorders ($M = 1.33$) compared to the MR ($M = .95$), high rate adult-peaked ($M = .48$), and high rate adolescence-peaked ($M = .81$) groups.

The third group, labeled the high rate adult-peaked (HRADL) group, was 7.7% of the total sample. This group had the longest average criminal career length, which spanned 12.1 years. The group's average age of first court contact was 14.1 years, and their average age at the time of their last court contact was 26.6. They amassed the greatest average (corrected) number of court contacts in adulthood ($M = 73.3$) and overall ($M = 84.7$). Additionally, this group committed the greatest number of violent and property offenses (although not significantly so compared to the high rate adolescence-peaked group) and served the greatest number of years in closed custody ($M = 13.3$) compared to the other three trajectory groups.

The fourth group, the high rate adolescence-peaked (HRADOL) group, comprised 5.6% of the total sample. The average criminal career length for members in this group was shorter relative to the MR and HRADL groups, averaging 9.8 years. Their first court contact occurred, on average, at age 14.3 years, while their average last court contact occurred at an average age of

24.1 years. Individuals in this group accumulated the largest number of court contacts in adolescence ($M = 21.5$) and had an average of 56.5 (corrected) total court contacts. They spent an average of 5.1 years in secure custody. This group is characterized by a large number of property and breach offenses and a sharp decline in offending around age 18.

Theories of Trajectory Group Etiology

Several theories of offending initiation have proposed that distinct factors and life processes uniquely predict membership in specific trajectory groups. These theories are based on two assumptions: 1) that there exist at least two unique patterns of offending, and 2) that the different trajectories possess distinct etiologies (Fergusson, Horwood, & Nagin, 2000). Gerald Patterson and colleagues, as well as Terrie Moffitt, have proposed two main theories of criminal trajectory group etiology. Patterson and colleagues' (Patterson, DeBaryshe, & Ramsey, 1989; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998; Patterson & Yoerger, 1993) theory involves two etiologically unique groups, one group characterized by an early onset of antisocial behaviour that continues in adolescence and adulthood. The early onset of delinquency is caused by antisocial behaviours learned from maladaptive family processes, such as inappropriate discipline, low parental supervision, and a lack of problem solving skills. The other offending group possesses a level of risk greater than nonoffenders but less than that of early onset offenders, engaging in antisocial behaviour in adolescence. In this group, delinquency results from social reinforcement by negative peers.

Moffitt's (1993) developmental taxonomy theory also posits that offenders belong to one of two offending groups. The first group, the life-course-persistent (LCP) offending group, displays antisocial behaviour early in life that persists throughout the course of their development. They have neuropsychological functioning deficits that include a difficult

temperament and compromised cognitive functioning. These deficits are exacerbated when combined with an adverse family and social environment that promotes antisociality. The second group, the adolescent-limited (AL) offending group, participates in criminal behaviour primarily in adolescence as a result of mimicking negative peer influence. This mimicry results from a need to assert independence and maturity.

Predictive Factors and Trajectory Group Membership

The relationship between criminal predictive and protective factors and offending trajectories continues to remain unresolved in the literature. Some studies have found common predictors across offender trajectories that differentiate the groups by the level of exposure. For example, Fergusson et al. (2000) reported that nonoffenders, adolescent-onset offenders, moderate offenders, and chronic offenders were differentiated by a single factor that included social disadvantage, family dysfunction, and individual difficulties, differing in level of risk exposure. The only factor to uniquely differentiate the groups was deviant peer affiliation. Similarly, in a study by Chung, Hill, Hawkins, Gilchrist, and Nagin (2002), a set of predictors that included aggressiveness, deviant peer association, and drug availability predicted various trajectories of offending, showing limited evidence of trajectory-specific predictors.

However, several studies have provided support for trajectory-specific predictors (Farrington & Hawkins, 1991). For example, Bartusch, Lynam, Moffitt, and Silva (1997) demonstrated that individual childhood factors (i.e., verbal ability, hyperactivity, and impulsivity) were strongly associated with offending in adolescence. In another study, Simons, Wu, Conger, and Lorenzo (1994) found that inadequate parenting accounted for early involvement in delinquency, while deviant peer association was predictive of later-onset offending. Moffitt, Caspi, Dickson, Silva, and Stanton (1996) reported that LCP and AL

offenders differed in terms of personality characteristics, school dropout, and family bonds. Additionally, Piquero, Brame, Mazerolle, and Haapanen (2002) showed that local life circumstances exerted different effects across distinct offender trajectories and offence types. Recently, Livingson et al. (2008) found between-group differences in Indigenous status and sex for trajectory group membership, with Indigenous and male offenders more likely to belong in their chronic offender group than non-Indigenous and female offenders.

Additional investigations have found that certain factors uniquely predict trajectory group membership while other factors are more common across trajectory groups. In one study by Loeber, Stouthamer-Loeber, van Kammen, and Farrington (1991), the correlates of initiation (i.e., social withdrawal, deviant peer association) of delinquency were distinct from those of escalation (i.e., school functioning, family functioning) but similar to the correlates of desistance (i.e., low social withdrawal, low disruptive behaviour). Smith and Brame (1994) demonstrated that some factors had the same effect on the initiation and continuation of offending (i.e., demographic factors, alcohol use, deviant peer association), whereas others had specific effects (i.e., living in rural areas, moral beliefs, negative labeling). Also, Ayers and colleagues (1999) and Nagin, Farrington, and Moffitt (1995) identified common and specific correlates of different offender trajectory groups. Last, White, Bates, and Buyske (2001) discovered overlap in correlates that distinguished nonoffenders from offenders and escalators from persistent offenders, but only one factor discriminated AL- from LCP-type offenders. In reviewing the literature on predictive factors and criminal trajectories, it is clear that further investigation is warranted to clarify the type and degree of influence predictive factors exert on trajectory group membership.

The Current Thesis Project

The purpose of the study was to expand on the body of knowledge about the relationship between criminal predictors in childhood and adolescence, protective factors, and longitudinal patterns of offending. In doing so, this thesis expanded on the work of Day et al. (2008) by examining their sample's client files from open custody for childhood and adolescent criminal predictors and protective factors and examining their relationship with the four criminal trajectories identified by Day et al.

Anticipated Outcomes

With regard to all hypotheses, it was assumed that Day et al.'s (2008) LR and HRADL groups represented Moffitt's (1993) AL and LCP groups, respectively. First, it was predicted that the HRADL group would have a greater number of broad criminal predictors occurring across childhood and adolescence compared to the other three trajectory groups. Second, the LR group was expected to have the fewest number of broad criminal predictors across childhood and adolescence. Third, of the childhood predictors, the HRADL group would have a greater number of low intelligence or poor academic achievement, hyperactivity-impulsivity-inattention, and familial abuse predictor items compared to the LR, MR, and HRADOL trajectory groups. Fourth, relative to the HRADL group, the LR group was predicted to have a greater number of peer-related predictor items and a lower number of familial abuse items occurring in adolescence.

Method

Design and Rationale of the Thesis

To identify relationships between childhood and adolescent predictors of offending and criminal trajectory group membership, a retrospective chart review of the client files of 362 male young offenders from the Toronto criminal career study (Day et al., 2008) was conducted.

Sample Characteristics

The client files of a sample of young offenders who resided in one of two open custody facilities operated by a children's mental health centre in Toronto, Ontario, Canada were examined. Criteria were not specified for inclusion in the study. Of a possible 378 client files, 362 files were reviewed and coded. The remaining 16 files could not be located at the children's mental health centre, possibly due to lost or incomplete files or an alternative storage location. Documents that were reviewed for coding included intake forms, predisposition or presentencing reports (PDR), psychological reports, psychiatric reports and notes, Youth Management Assessments (YMA), Plan of Care reports, discharge summaries, and other pertinent information sources on file such as case notes, social work reports, and police synopses. For the purpose of this study, the PDRs, psychological reports, and psychiatric reports were considered important documents for coding, as they typically contained a broad range of information about the youth, such as their developmental and family history, current familial and peer relationships, significant life events, and performance in school.

Procedure

Prior to data collection, the study was approved by Ryerson University's Psychology Department and Research Ethics Board, and agreement to access the sample's client files was obtained from the children's mental health centre. As well, to preserve the sample's

confidentiality, the principal investigator signed a confidentiality form with the children's mental health centre. To further protect the sample's identity, the data collection took place in a secluded room at the children's mental health centre and each file was assigned a unique identification number for the purposes of statistical analysis. The statistical results reported in the current thesis were obtained from analyses with aggregated data only.

Development of the coding schemes. An impression of the quantity and quality of the information in the client files was gained by examining a parallel sample of 100 youth offender files at the children's mental health centre. These youths were admitted to one of the two open custody facilities during the same time period as the current sample but were not included as part of the 362 offenders in the study. As such, the type and nature of the information contained in these youths' files were comparable to the sample's information that was coded for the current thesis. The types of factors available in the files were noted (i.e., factors from the individual, family, peer and school domains).

While noting the information available in the parallel files, the predictors for the study were selected based on a review of the literature on the causes and correlates of criminal behaviour as well as factors that protect against involvement in delinquency. The literature review included cross-sectional and prospective longitudinal studies as well as information on criminal risk/need instruments such as the Level of Service Inventory-Ontario Revision (LSI-OR; Andrews, Bonta, & Wormith, 1995), the Early Risk List Assessment for Boys (EARL 20B Version 2; Augimeri, Webster, Koegl, & Levene, 2001), and the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2002). The protective factors were selected from studies on resiliency and promotive influences.

Based on the parallel sample file review and literature review, dichotomized (i.e., present/absent or yes/unknown) checklist-style coding schemes were developed and utilized to extract the data for the childhood and adolescent criminal predictors (see Appendices A through D). To capture changes in predictive influences over the two developmental stages, separate coding schemes for childhood (i.e., birth to age 12) and adolescence (i.e., 13 to 19) were created. Dichotomization was considered to be the most appropriate method for gathering the predictor data. Given the type of sources and styles of information contained in the files, dichotomization represented an efficient and objective method of extracting the data and was best suited for the analyses with the outcome variable. As well, the results provide statistics that are meaningful and uncomplicated for many audiences to interpret (Farrington & Loeber, 2000).

Childhood criminal predictors. A total of 17 broad predictor categories, comprised of 88 specific items, were selected for the childhood criminal predictor coding scheme. The broad predictors fell within four domains: 1) individual, 2) family, 3) peer, and 4) school. The broad predictors for the individual domain were: 'low intelligence or poor academic achievement,' 'hyperactivity-impulsivity-inattention,' 'antisocial behaviour,' 'alcohol and/or drug use,' 'health problems,' 'low self-esteem,' and 'extra-familial sexual abuse.' The broad predictors within the family domain included: 'criminal family members,' 'parental psychopathology,' 'poor child-rearing methods,' 'familial abuse,' 'relationship difficulties,' 'broken home or family transitions,' 'involvement with alternative care,' and 'biological mother was age 17 or younger at the time of childbirth.' Additionally, the peer and school domains were represented by a single broad predictor termed 'peer factor' and 'school factor,' respectively.

Childhood protective factors. A total of 8 broad predictors, made of 13 specific items, were included for the childhood protective factor coding scheme. The broad predictors fell

within four domains: 1) individual, 2) family, 3) peer, and 4) school. Broad predictors for the individual domains included: 'average to high intelligence or academic achievement,' 'effective use of leisure time,' and 'positive response to authority.' For the family domain, the broad predictors were: 'parental nurturance,' 'positive child-rearing methods,' and 'family cohesion.' 'Positive peer relations' and 'positive regard for school' were included to broadly represent the peer and school domains, respectively.

Adolescent criminal predictors. A total of 18 broad predictor categories, made of 110 specific items, comprised the adolescent criminal predictor coding scheme. The broad categories fell within the 1) individual, 2) family, 3) peer, and 4) school domains. The broad predictors for the individual domain included: 'low intelligence or poor academic achievement,' 'hyperactivity-impulsivity-inattention,' 'antisocial behaviour,' 'callousness,' 'lacks responsibility or accountability,' 'alcohol and/or drug use,' 'health problems,' 'low self-esteem,' and 'extra-familial sexual abuse.' Broad categories within the family domain included: 'criminal family members,' 'parental psychopathology,' 'poor child-rearing methods,' 'familial abuse,' 'relationship difficulties,' 'broken home or family transitions,' and 'involvement with alternative care.' Additionally, 'peer factor' and 'school factor' were included as broad categories to account for the peer and school domains, respectively.

Adolescent protective factors. In terms of the adolescent protective factors, there were 9 broad categories that were comprised of 14 specific items. The broad categories fell within the 1) individual, 2) family, 3) peer, and 4) school domains. The broad predictors for the individual domain were: 'average to high intelligence or academic achievement,' 'effective use of leisure time,' 'positive response to authority,' and 'experienced remorse or guilt for actions.' The family domain contained the following broad predictors: 'parental nurturance,' 'positive child-rearing

methods,' and 'family cohesion.' 'Positive peer relations' and 'positive regard for school' broad predictors represented the peer and school domains, respectively.

The coding process. All documents in each client file were reviewed for the presence of the specific items. If an item was present or highly suspected in the document being reviewed, the specific item was checked on the age-appropriate coding scheme as 'Yes/Suspected' and assigned a value of '1.' Factors that were not noted as present in the file were considered 'Unknown' and assigned a value of '0.' If one or more items were checked under a broad predictor, the broad predictor was assigned a value of '1.' For example, if information in a youth's PDR stated that he was physically abused at age 9 by his father, the specific item 'physically abused' was checked as 'Yes/Suspected,' as well as the broad predictor 'familial abuse,' on the childhood coding scheme. Once the coding was completed, the data were entered into a database for statistical purposes.

Inter-rater reliability. For all factors on the childhood and adolescent coding schemes, inter-rater reliability, as measured by Cohen's Kappa (Cohen, 1960), was obtained on two occasions by two independent raters. Of the variables with computed Kappa values, the average Kappa values for all specific items and broad predictors contained on the childhood criminal predictor coding scheme at Times 1 and 2 was .79 and .64, indicating overall good reliability (Landis & Koch, 1977). Table 2.1 summarizes the Kappa values for the childhood criminal predictors. The average Kappa values for the specific items and broad predictors on the childhood protective factor coding scheme at Times 1 and 2 was .63 and 1.00, which suggested good and excellent reliability, respectively. The results of the Kappa values for all the broad protective factors and specific items in childhood are displayed in Table 2.2.

For all of the broad predictors and specific items on the adolescent criminal predictor coding schemes, inter-rater reliability at Times 1 and 2 yielded average Kappa values of .76 and .59, indicating good and moderate reliability, respectively. Table 2.3 summarizes the Kappa values for the adolescent criminal predictors. Finally, the average Kappa values for the adolescent protective specific items and broad factors at Times 1 and 2 were .84 and .54, suggesting excellent and moderate reliability, respectively. Table 2.4 displays the Kappa values for all adolescent broad protective factors and specific items.

Plan of Analysis

The study's analyses were performed using the Statistical Package for the Social Sciences (SPSS) Version 16. The study's hypotheses were examined using oneway analysis of variance (ANOVA) tests. Cross tabulations were performed to further explore the differences in predictor frequency among the trajectory groups. To determine the predictive relationships between the criminal predictors and trajectory groups, a backward stepwise multinomial logistic regression procedure was used. This procedure is useful when important predictors have not been identified and when the association between the predictors and outcome variables are not well understood (Hosmer & Lemeshow, 2000). As well, given the large number of predictors that were collected for the analyses, the stepwise procedure provided an effective method for selecting the most appropriate predictors and creating the most parsimonious multinomial logistic regression models for each set of predictors.

Predictor variables with zero cell counts and base rates of 10% or less were not included in the backward stepwise analyses. Given the overall low base rate of protective factors in both childhood and adolescence, as well as zero cell count occurrences, the protective factors were not included in these analyses. For all of the multinomial logistic regression models, the independent

Table 2.1

Time 1 and Time 2 Inter-Rater Reliability for the Childhood Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Low intelligence or poor academic achievement	.85	Excellent	.85	Excellent
Low intelligence	1.00	Excellent	.00	-- ^b
Learning disability	.81	Excellent	.80	Good
Enrolled in special education classes	.94	Excellent	.67	Good
Failed or repeated a grade	.83	Excellent	.72	Good
General academic-related difficulties	.48	Moderate	.46	Moderate
Hyperactivity-impulsivity-inattention	.77	Good	.53	Moderate
Attention or concentration difficulties/easily distracted	.79	Good	.00	-- ^b
Restless	1.00	Excellent	.00	-- ^b
Cannot wait or take turns	.00	-- ^b	.00	-- ^b
Hyperactive/very active/energetic	.88	Excellent	.65	Good
Difficulty planning ahead	.00	-- ^b	.00	-- ^b
Acted on impulse	.47	Moderate	.35	Fair
Attention-deficit disorder diagnosis	.79	Good	.00	-- ^b
Attention-deficit/hyperactivity disorder diagnosis	.00	-- ^b	.47	Moderate
Antisocial behaviour	.89	Excellent	.64	Good
Uses inappropriate language	.00	-- ^b	.00	-- ^b
Defiant toward set rules or authority figures	.79	Good	.43	Moderate
Quick to anger	.72	Good	-.033	Poor
Temper tantrums	1.00	Excellent	.00	-- ^b
Verbally aggressive	.64	Good	.71	Good
Physically aggressive	.91	Excellent	.54	Moderate
Sexually precocious	.66	Good	.00	-- ^b
Engaged in inappropriate sexual behaviour	1.00	Excellent	.65	Good

Table 2.1 continued

Time 1 and Time 2 Inter-Rater Reliability for the Childhood Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized	Level of	Generalized	Level of
	Kappa	Agreement ^a	Kappa	Agreement
Lying	.72	Good	.78	Good
Manipulative	.77	Good	1.00	Excellent
Runs away	.63	Good	.52	Moderate
Harmful towards animals	1.00	Excellent	.00	-- ^b
Vandalized	.66	Good	.78	Good
Stealing	.69	Good	1.00	Excellent
Break and enter	1.00	Excellent	.00	-- ^b
Fire-setting behaviour	1.00	Excellent	1.00	Excellent
Gang member	.00	-- ^b	.00	-- ^b
Poor behaviour not specified	.59	Moderate	.41	Moderate
Alcohol and/or drug use	1.00	Excellent	.64	Good
Alcohol	1.00	Excellent	.48	Moderate
Drugs	1.00	Excellent	.48	Moderate
Health problems	.92	Excellent	.00	-- ^b
Traumatic head injury	1.00	Excellent	.00	-- ^b
Seizures	.00	-- ^b	.00	-- ^b
Early ear infections	1.00	Excellent	.00	-- ^b
Enuresis	.00	-- ^b	.00	-- ^b
Encopresis	.00	-- ^b	.00	-- ^b
Obesity	.00	-- ^b	.00	-- ^b
Hygiene problems	.00	-- ^b	.00	-- ^b
Other health problems	.88	Excellent	.00	-- ^b
Low self-esteem	.66	Good	.00	-- ^b
Extra-familial sexual abuse	1.00	Excellent	1.00	Excellent
Criminal family members	1.00	Excellent	.48	Moderate
Criminal mother	.00	-- ^b	.00	-- ^b
Criminal father	1.00	Excellent	.65	Good
Criminal sibling	1.00	Excellent	.00	-- ^b
Parental psychopathology	.93	Excellent	.73	Good
Mental health difficulties – mother	.00	-- ^b	.48	Moderate
Mental health difficulties – father	1.00	Excellent	.47	Moderate
Psychiatric hospitalization – mother	.00	-- ^b	.00	-- ^b

Table 2.1 continued

Time 1 and Time 2 Inter-Rater Reliability for the Childhood Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Psychiatric hospitalization – father	.00	-- ^b	.00	-- ^b
Alcohol and/or drug use – mother	.00	-- ^b	.47	Moderate
Alcohol and or drug use – father	1.00	Excellent	.76	Good
Prenatal drinking or drug use	.00	-- ^b	1.00	Excellent
Poor child-rearing methods	.65	Good	.54	Moderate
Authoritarian or harsh discipline	.75	Good	.79	Good
Lax discipline	.75	Good	.00	-- ^b
Inconsistent discipline	.45	Moderate	.78	Good
Poor parental supervision	.69	Good	.64	Good
Poor parental management skills	.50	Moderate	.67	Good
Abandonment of child	1.00	Excellent	.00	-- ^b
Familial abuse	.84	Excellent	.66	Good
Physically abused	.87	Excellent	.83	Excellent
Sexually abused	1.00	Excellent	.00	-- ^b
Verbally or emotionally abused	1.00	Excellent	.35	Fair
Neglected	.69	Good	.48	Moderate
Witnessed physical abuse	.64	Good	.52	Moderate
Witnessed sexual abuse	.00	-- ^b	.00	-- ^b
Witnessed verbal or emotional abuse	.00	-- ^b	.00	-- ^b
Relationship difficulties	.39	Fair	.74	Good
Poor relations among family members	.13	Poor	.63	Good
Family discord	.47	Moderate	.67	Good
Low family cohesion/stability	.29	Fair	.00	-- ^b
Broken home or family transitions	.94	Excellent	.79	Good
Parental separation	.85	Excellent	.55	Moderate
Parental divorce	.83	Excellent	.71	Good

Table 2.1 continued

Time 1 and Time 2 Inter-Rater Reliability for the Childhood Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Single parent	.71	Good	.54	Moderate
Parental remarriage	.42	Moderate	.59	Moderate
Frequent change in parental figures	.72	Good	.24	Fair
Frequent moving	.77	Good	.45	Moderate
Involvement with alternative care	.90	Excellent	.87	Excellent
Child welfare agency	.95	Excellent	.81	Excellent
Foster care	1.00	Excellent	.63	Good
Adopted	1.00	Excellent	1.00	Excellent
Other institutional involvement	.55	Moderate	.45	Moderate
Biological mother was age 17 or younger at childbirth	.00	--^b	.00	--^b
Poor relations with peers	.94	Excellent	.52	Moderate
Poor ability to socialize with peers	.80	Good	.65	Good
Difficulty relating to peers	.00	-- ^b	.00	-- ^b
Peer rejection	1.00	Excellent	.00	-- ^b
Easily influenced by peers	.36	Fair	.00	-- ^b
Unwilling to associate with prosocial peers	.00	-- ^b	.00	-- ^b
Negative peer association	.88	Excellent	.47	Moderate
Criminal peers	.00	-- ^b	1.00	Excellent
Poor regard for school	.63	Good	.71	Good
Lack of academic motivation or interest	.68	Good	.00	-- ^b
Truant	.59	Moderate	.83	Excellent
Suspended	.66	Good	.00	-- ^b
Expelled	.00	-- ^b	.00	-- ^b

Note. ^aBased on the Kappa ranges as determined by Landis & Koch (1977), >.20 is considered a poor strength of association while .21-.40 is fair, .41-.60 is moderate, .61-.80 is good, and .80-1.00 is excellent. ^bKappa reflects skewed data due to a dichotomous response category with almost all of the responses in one category.

Table 2.2

Time 1 and Time 2 Inter-Rater Reliability for the Childhood Protective Factors.

Protective Factor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Average to high intelligence or academic achievement	.48	Moderate	.00	--^b
Average intelligence	.64	Good	.00	-- ^b
Superior intelligence	.00	-- ^b	.00	-- ^b
Reasonable academic achievement	.45	Moderate	.00	-- ^b
Superior academic achievement	.00	-- ^b	.00	-- ^b
Effective use of leisure time	.66	Good	1.00	Excellent
Involvement in sports	.66	Good	1.00	Excellent
Involvement in other prosocial activities	.00	-- ^b	1.00	Excellent
Positive response to authority	.00	--^b	.00	--^b
Parental nurturance	.77	Good	.00	--^b
Positive child-rearing methods	.66	Good	.00	--^b
Authoritative discipline	.00	-- ^b	.00	-- ^b
Use of other appropriate discipline techniques	.66	Good	.00	-- ^b
Family cohesion	.78	Good	1.00	Excellent
Family members are close	.78	Good	.00	-- ^b
Family members express good communication	.00	-- ^b	.00	-- ^b
Family participates in activities together	.00	-- ^b	1.00	-- ^b
Positive peer relations	.00	--^b	.00	--^b
Positive peer association	.00	-- ^b	.00	-- ^b
Well-liked by peers	.00	-- ^b	.00	-- ^b
Positive regard for school	.38	Fair	.00	--^b

Note. ^aBased on the Kappa ranges as determined by Landis & Koch (1977), >.20 is considered a poor strength of association while .21-.40 is fair, .41-.60 is moderate, .61-.80 is good, and .80-1.00 is excellent. ^bKappa reflects skewed data due to a dichotomous response category with almost all of the responses in one category.

Table 2.3

Time 1 and Time 2 Inter-Rater Reliability for the Adolescent Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Low intelligence or poor academic achievement	.70	Good	1.00	Excellent
Low intelligence	.88	Excellent	1.00	Excellent
Learning disability	.48	Moderate	.43	Moderate
Enrolled in special education classes	.39	Fair	.51	Moderate
General academic-related difficulties	.61	Good	.21	Fair
Dropped out of school	.95	Excellent	.71	Good
Hyperactivity-impulsivity-inattention	.80	Good	.60	Good
Attention or concentration difficulties/easily distracted	.63	Good	.30	Fair
Restless	.00	-- ^b	.65	Good
Cannot wait or take turns	.00	-- ^b	.00	-- ^b
Hyperactive/very active/energetic	.54	Moderate	.26	Fair
Difficulty planning ahead	.63	Good	.00	-- ^b
Low self-control	.56	Moderate	.00	-- ^b
Acted on impulse	.80	Excellent	.61	Good
Attention-deficit disorder diagnosis	.00	-- ^b	.00	-- ^b
Attention-deficit/hyperactivity disorder diagnosis	.00	-- ^b	.35	Fair
Antisocial behaviour	.53	Moderate	.00	--^b
Uses inappropriate language	.48	Moderate	.33	Fair
Defiant toward set rules or authority figures	.75	Good	.21	Fair
Quick to anger	.78	Good	.63	Good
Verbally aggressive	.80	Good	.61	Good
Physically aggressive	.85	Excellent	.72	Good
Engaged in inappropriate sexual behaviour	1.00	Excellent	.84	Excellent
Lying	.63	Good	.60	Moderate

Table 2.3 continued

Time 1 and Time 2 Inter-Rater Reliability for the Adolescent Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized	Level of	Generalized	Level of
	Kappa	Agreement ^a	Kappa	Agreement
Manipulative	.73	Good	.81	Excellent
Runs away	.86	Excellent	.67	Good
Harmful towards animals	1.00	Excellent	.00	-- ^b
Vandalized	.44	Moderate	.35	Fair
Stealing	.64	Good	.46	Moderate
Break and enter	1.00	Excellent	1.00	Excellent
Fire-setting behaviour	1.00	Excellent	1.00	Excellent
Gang member	1.00	Excellent	.00	-- ^b
Poor behaviour not specified	.44	Moderate	.47	Moderate
Callousness	.80	Good	.79	Good
Shallow affect	.70	Good	.00	-- ^b
Lacks empathy	.64	Good	.00	-- ^b
Lacks remorse or guilt	.79	Good	.79	Good
Lacks responsibility or accountability	.61	Good	.56	Moderate
Alcohol and/or drug use	.93	Excellent	.53	Moderate
Alcohol	.90	Excellent	.74	Good
Hallucinogens	.90	Excellent	.93	Excellent
Stimulants	1.00	Excellent	1.00	Excellent
Opiates	1.00	Excellent	.00	-- ^b
Depressants	1.00	Excellent	.00	-- ^b
Other drugs	1.00	Excellent	.00	-- ^b
Drugs not specified	.63	Good	.63	Good
Health problems	.84	Excellent	.43	Moderate
Traumatic head injury	.66	Good	.00	-- ^b
Seizures	.00	-- ^b	.00	-- ^b
Enuresis	.00	-- ^b	.00	-- ^b
Encopresis	.00	-- ^b	.00	-- ^b
Hygiene problems	.79	Good	.85	Excellent
Other health problems	.00	-- ^b	.00	-- ^b
Low self-esteem	.76	Good	.63	Good
Extra-familial sexual abuse	1.00	Excellent	.00	--^b
Criminal family members	.76	Good	.00	--^b
Criminal mother	1.00	Excellent	.00	-- ^b
Criminal father	1.00	Excellent	.00	-- ^b
Criminal sibling	.73	Good	.00	-- ^b

Table 2.3 continued

Time 1 and Time 2 Inter-Rater Reliability for the Adolescent Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Parental psychopathology	1.00	Excellent	.52	Good
Mental health difficulties – mother	.00	-- ^b	1.00	Excellent
Mental health difficulties – father	.00	-- ^b	.00	-- ^b
Psychiatric hospitalization – mother	.00	-- ^b	.00	-- ^b
Psychiatric hospitalization – father	.00	-- ^b	.00	-- ^b
Alcohol and/or drug use – mother	1.00	Excellent	.65	Good
Alcohol and or drug use – father	1.00	Excellent	.61	Good
Poor child-rearing methods	.75	Good	.44	Moderate
Authoritarian or harsh discipline	1.00	Excellent	.62	Good
Lax discipline	.72	Good	1.00	Excellent
Inconsistent discipline	.38	Fair	.52	Moderate
Poor parental supervision	.36	Fair	1.00	Excellent
Poor parental management skills	.49	Moderate	.21	Fair
Abandonment of child	.79	Good	.00	-- ^b
Familial abuse	1.00	Excellent	.51	Moderate
Physically abused	.79	Good	.87	Excellent
Sexually abused	1.00	Excellent	.00	-- ^b
Verbally or emotionally abused	.66	Good	.43	Moderate
Neglected	1.00	Excellent	-.03	Poor
Witnessed physical abuse	.00	-- ^b	-.03	Poor
Witnessed sexual abuse	.00	-- ^b	.00	-- ^b
Witnessed verbal or emotional abuse	.00	-- ^b	.00	-- ^b
Relationship difficulties	.59	Moderate	.55	Moderate
Poor relations among family members	.67	Good	.59	Moderate
Family discord	.69	Good	.57	Moderate

Table 2.3 continued

Time 1 and Time 2 Inter-Rater Reliability for the Adolescent Criminal Predictors.

Criminal Predictor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Low family cohesion/stability	.38	Fair	.48	Moderate
Broken home or family transitions	.46	Moderate	.50	Moderate
Parental separation	.64	Good	.63	Good
Parental divorce	.00	-- ^b	.65	Good
Single parent	.79	Good	-.03	Poor
Parental remarriage	1.00	Excellent	.45	Moderate
Frequent change in parental figures	.00	-- ^b	.00	-- ^b
Frequent moving	.49	Moderate	.39	Fair
Involvement with alternative care	1.00	Excellent	.68	Good
Child welfare agency	.94	Excellent	.68	Good
Foster care	.90	Excellent	.61	Good
Adopted	1.00	Excellent	.00	-- ^b
Other institutional involvement	.84	Excellent	.49	Moderate
Poor relations with peers	.70	Good	.66	Good
Poor ability to socialize with peers	.90	Excellent	.82	Excellent
Difficulty relating to peers	.38	Fair	-.03	Poor
Peer rejection	.00	-- ^b	.38	Fair
Easily influenced by peers	.70	Good	1.00	Excellent
Unwilling to associate with prosocial peers	.00	-- ^b	.00	-- ^b
Negative peer association	.54	Moderate	.71	Good
Criminal peers	.83	Excellent	.63	Good
Poor regard for school	.60	Moderate	.69	Good
Lack of academic motivation or interest	.54	Moderate	.45	Moderate
Truant	.75	Good	.74	Good
Suspended	.73	Good	.76	Good
Expelled	.64	Good	.71	Good

Note. ^aBased on the Kappa ranges as determined by Landis & Koch (1977), >.20 is considered a poor strength of association while .21-.40 is fair, .41-.60 is moderate, .61-.80 is good, and .80-1.00 is excellent. ^bKappa reflects skewed data due to a dichotomous response category with almost all of the responses in one category.

Table 2.4

Time 1 and Time 2 Inter-Rater Reliability for the Adolescent Protective Factors.

Protective Factor	Time 1 (No. of cases: 40) (No. of raters: 2)		Time 2 (No. of cases: 31) (No. of raters: 2)	
	Generalized Kappa	Level of Agreement ^a	Generalized Kappa	Level of Agreement
Average to high intelligence or academic achievement	.87	Excellent	.52	Moderate
Average intelligence	.88	Excellent	.43	Moderate
Superior intelligence	.00	-- ^b	.00	-- ^b
Reasonable academic achievement	1.00	Excellent	.65	Good
Superior academic achievement	.00	-- ^b	.00	-- ^b
Effective use of leisure time	.80	Good	.69	Good
Involvement in sports	.83	Excellent	.24	Fair
Involvement in other activities	.88	Excellent	1.00	Excellent
Positive response to authority	.00	--^b	.53	Moderate
Experienced remorse or guilt for actions	.72	Good	.63	Good
Parental nurturance	.77	Good	.20	Poor
Positive child-rearing methods	1.00	Excellent	.00	--^b
Authoritative discipline	.00	-- ^b	.00	-- ^b
Use of other appropriate discipline techniques	1.00	Excellent	.00	-- ^b
Family cohesion	.66	Good	.00	Fair
Family members are close	.66	Good	.33	Fair
Family members express good communication	1.00	Excellent	.00	-- ^b
Family participates in activities together	.00	-- ^b	.00	-- ^b
Positive peer relations	.66	Good	.30	Fair
Positive peer association	.00	-- ^b	.00	-- ^b
Well-liked by peers	.66	Good	1.00	Excellent
Positive regard for school	1.00	Excellent	.00	--^b

Note. ^aBased on the Kappa ranges as determined by Landis & Koch (1977), >.20 is considered a poor strength of association while .21-.40 is fair, .41-.60 is moderate, .61-.80 is good, and .80-1.00 is excellent. ^bKappa reflects skewed data due to a dichotomous response category with almost all of the responses in one category.

variables were the criminal predictors in childhood and adolescence and the dependent variable was trajectory group membership.

The backward stepwise models were formed based on the procedure outlined by Hosmer and Lemeshow (2000). In brief, all criminal predictor variables with no zero cell counts and a base rate frequency greater than 10% were assessed for appropriateness in the model by carefully examining the impact of their presence and absence on the overall goodness-of-fit and the chi-square Likelihood Ratio Test statistic. A predictor variable was not included in the model if the corresponding chi-square Likelihood Ratio Test statistic reached a significance level of .25 or greater. The backward stepwise procedure individually removed variables with large standard errors and those with the largest p values while assessing the model at each step of removal for significant change. The removal criterion was set at $p \leq .1$ (Hosmer & Lemeshow).

Results

Preliminary Analyses

The four trajectory groups were tested for differences in frequency of information source. Table 3.1 shows the percentage of information source by trajectory group based on cross tabulation analyses. A significant difference was found for the number of YMAS across the trajectory groups. Specifically, the LR group had the greatest number of Youth Management Assessments (YMAS) (31.7%) compared to the HRADOL group (19.0%), the MR group (12.2%), and the HRADL group (6.9%). Since there were no significant differences among the trajectory groups for all other sources of information, this difference was unlikely to affect the results of the study's analyses.

Hypothesis Testing

For all tests related to the study's hypotheses, trajectory group membership represented the independent variable and the sum total of a broad predictor's specific items was the dependent variable. The first research question examined whether Day et al.'s (2008) HRADL group accumulated more broad criminal predictors across childhood and adolescence compared to the LR, MR, and HRADOL groups. The results of three oneway analysis of variance (ANOVA) tests revealed that, across the four trajectory groups, there were no significant differences in the total number of broad criminal predictors in childhood ($F(3, 358) = 1.54, p = .21$), in adolescence ($F(3, 358) = 1.06, p = .37$), or for childhood and adolescence combined ($F(3, 358) = 1.62, p = .18$). Therefore, contrary to prediction, the number of broad criminal predictors in childhood and adolescence were equal across the four trajectory groups.

The second research question addressed whether the LR trajectory group had the fewest number of broad criminal predictors in childhood and adolescence compared to the MR,

Table 3.1

Cross Tabulation of Information Source across the Four Trajectory Groups.

Information Source	Total	Trajectory Group				$\chi^2(df)$
		MR ^a (<i>n</i> = 82)	LR ^b (<i>n</i> = 246)	HRADL ^c (<i>n</i> = 29)	HRADOL ^d (<i>n</i> = 21)	
Predisposition report	71.4	74.4	70.3	82.8	57.1	4.42(3)
Psychological report	12.4	12.2	13.4	10.3	4.8	1.47(3)
Psychiatric report	9.3	15.9	8.1	6.9	0.0	6.95(3)
Psychiatric notes	3.4	6.1	2.4	3.4	4.8	2.60(3)
Youth Management						
Assessment	24.9	12.2	31.7	6.9	19.0	18.60(3)*
Plan of care report	46.8	46.3	48.4	44.8	33.3	1.83(3)
Discharge report	72.2	64.6	75.6	69.0	66.7	4.24(3)
Other sources	32.0	29.3	32.9	27.6	38.1	1.00(3)

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

p* ≤ .05, *p* ≤ .01, ****p* ≤ .001

HRADL, and HRADOL trajectory groups. Since the previous three ANOVA tests did not reach statistical significance, the LR group did not differ from the other three groups on the total number of broad criminal predictors in childhood and adolescence.

The third research question examined whether the HRADL group would have a greater number of items in the following predictor categories, low intelligence or poor academic achievement, hyperactivity-impulsivity-inattention (HIA) and familial abuse items, in childhood compared to the other three trajectory groups. It was noted that the distribution of two predictors, low intelligence or poor academic achievement and HIA, were positively skewed. A log transformation was applied to these two predictors and the oneway ANOVA tests were performed. However, the results of the ANOVAs with transformed data were similar to the results without the transformation. As such, the results of the analyses without the transformation were reported.

A oneway ANOVA test showed significant differences among the trajectory groups for low intelligence or poor academic achievement items ($F(3, 358) = 3.40$, partial $\eta^2 = .028$, *p* =

.02). Since the Levene's Test of Equality of Error Variances was significant ($p = .001$), a Dunnett's C was used to determine the differences among the trajectory groups. The Dunnett's C test did not identify any significant differences among the four groups. However, in support of the hypothesis, the HRADL group had the largest mean number of items ($M = 1.14$, $SD = 1.27$) relative to the MR group ($M = .59$, $SD = .93$), the LR group ($M = .59$, $SD = .97$) and the HRADOL group ($M = .35$, $SD = .75$). For the number of HIA items, a oneway ANOVA test did not find a significant relationship among the trajectory groups ($F(3, 358) = 1.65$, $p = .18$). As well, significant differences were not found among the trajectory groups for the number of familial abuse items in childhood ($F(3, 358) = .30$, $p = .82$). Therefore, while low intelligence or poor academic achievement items significantly differentiated the four trajectory groups, HIA and familial abuse items did not. Although the specific group differences could not be confirmed, the group means for the low intelligence or poor academic achievement items showed a trend in the direction of the expected outcome.

The fourth research question sought to determine whether the LR trajectory group was characterized by a greater number of peer-related criminal predictor items and fewer familial abuse items in adolescence compared to the HRADL trajectory group. A oneway ANOVA test revealed significant differences among the four groups for the peer-related items ($F(3, 358) = 3.73$, partial $\eta^2 = .30$, $p = .012$), and a Tukey's post-hoc multiple comparisons tests showed a significant difference between the LR and MR groups ($p < .05$). Specifically, the LR group had a greater number of peer-related items ($M = .99$, $SD = .99$) than the MR group ($M = .67$, $SD = .78$).

To test for differences in the number of familial abuse items in adolescence, a oneway ANOVA was performed and was statistically significant ($F(3, 358) = 2.72$, partial $\eta^2 = .022$, $p = .045$). Since the Levene's Test of Equality of Error Variances was significant ($p < .001$), a

Dunnett's C post-hoc multiple comparisons test was used to examine group differences. The Dunnett's C test showed significant differences between the LR, HRADL, and HRADOL groups ($p < .05$); in particular, the LR group ($M = .25$, $SD = .60$) had a significantly greater number of familial abuse factors than the HRADL group ($M = .035$, $SD = .19$) and HRADOL group ($M = .050$, $SD = .22$). Therefore, contrary to the predicted outcome, the number of peer-related items in adolescence did not differ between the LR and HRADL groups. However, compared to the MR group, the LR group had a greater number of peer-related items. Additionally, there was a significant difference between LR and HRADL groups for familial abuse items, although the difference was in the opposite direction of the anticipated outcome.

Cross Tabulation Analyses

Childhood predictors. Table 3.2 shows the frequency of the broad childhood criminal predictors across the trajectory groups based on cross tabulation analyses. Significant differences were found among the four groups regarding antisocial behaviour. Specifically, 72% of the HRADL group engaged in antisocial behaviour in childhood compared to 54.4% of the MR group, 44.4% of the LR group, and 40% of the HRADOL group ($p = .02$). A greater prevalence of relationship difficulties was found among the HRADL group (41.4%) compared to 26.6% of the MR group, 20% of the HRADOL group, and 17.9% of the LR group ($p = .02$). Additionally, involvement with alternative care was statistically significant, occurring in 62.1% of the HRADL group, 60.0% in the HRADOL group, 43.0% in the MR group, and 34.6% in the LR group ($p < .006$).

Table 3.3 displays the cross tabulation analyses of the childhood protective factors across the four trajectory groups. Within this set of factors, none of the analyses reached statistical significance.

Table 3.2

Cross Tabulation of Childhood Criminal Predictors across the Four Trajectory Groups.

Criminal Predictor	Trajectory Group				$\chi^2(df)$
	MR ^a (n = 82)	LR ^b (n = 246)	HRADL ^c (n = 29)	HRADOL ^d (n = 21)	
Low intelligence or poor academic achievement	35.4	36.3	51.7	25.0	4.06(3)
Hyperactivity-impulsivity-inattention	25.3	22.2	37.9	25.0	3.53(3)
Antisocial behaviour	54.4	44.4	72.4	40.0	9.87(3)*
Alcohol and/or drug use	6.3	6.0	10.3	5.0	.89(3)
Health problems	7.6	11.5	13.8	5.0	1.96(3)
Low self-esteem	2.5	3.8	3.4	5.0	.42(3)
Extra-familial sexual abuse	7.6	4.7	6.9	10.0	1.69(3)
Criminal family members	10.1	10.7	10.3	5.0	.65(3)
Parental psychopathology	32.9	30.3	20.7	20.0	2.47(3)
Poor child-rearing methods	38.0	34.2	34.5	35.0	.38(3)
Familial abuse	39.2	38.5	37.9	25.0	1.51(3)
Relationship difficulties	26.6	17.9	41.4	20.0	9.65(3)*
Broken home or family transitions	68.4	53.0	62.1	45.0	7.13(3)
Involvement with alternative care	43.0	34.6	62.1	60.0	12.34(3)**
Biological mother was age 17 or younger at childbirth	2.5	4.3	3.4	.0	1.32(3)
Poor relations with peers	10.1	10.3	6.9	10.0	.33(3)
Poor behaviour towards school	21.5	19.7	27.6	35.0	3.26(3)

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Adolescent predictors. The results of the cross tabulation analyses for the adolescent broad criminal predictors across the four trajectory groups are shown in Table 3.4. Criminal family members was found to be significant ($p = .028$), with an occurrence of 25% in the HRADOL group, 20.7% in the HRADL group, 20.3% in the MR group, and 9.8% in the LR group. Broken home or family transitions was marginally significant ($p = .053$), occurring in

Table 3.3

Cross Tabulation of Childhood Protective Factors across the Four Trajectory Groups.

Protective Factor	Trajectory Group				$\chi^2(df)$
	MR ^a (<i>n</i> = 82)	LR ^b (<i>n</i> = 246)	HRADL ^c (<i>n</i> = 29)	HRADOL ^d (<i>n</i> = 21)	
Average to high intelligence or academic achievement	7.6	8.1	3.4	10.0	.94(3)
Effective use of leisure time	2.5	7.7	3.4	.0	4.60(3)
Positive response to authority	2.5	2.1	.0	.0	1.17(3)
Parental nurturance	5.1	3.0	.0	.0	2.64(3)
Positive discipline methods	.0	1.7	.0	5.0	3.62(3)
Family cohesion	2.5	3.8	.0	5.0	1.53(3)
Positive peer relations	.0	.9	.0	.0	1.10(3)
Positive regard for school	.0	.4	3.4	.0	5.04(3)

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

p* ≤ .05, *p* ≤ .01, ****p* ≤ .001

51.7% in the HRADL group, 44.3% in the MR group, 38.5% in the LR group, and 15% in the HRADOL group. As well, poor peer relations was marginally significant (*p* = .059); this factor was present for 65% in the LR group, 55.2% in the HRADL group, 50.6% in the MR group, and 45.0% in the HRADOL group.

Table 3.5 shows the results of the cross tabulation analyses of the broad protective factors in adolescence across the trajectory groups. Positive response to authority was found to vary significantly across the groups. Specifically, this predictor occurred in 17.9% in the LR group, 10.3% in the HRADL group, 3.8% in the MR group, and 0% in the HRADOL group.

Multinomial Logistic Regression Analyses

Childhood criminal predictor model. Table 3.6 displays the results of the backward stepwise multinomial logistic regression procedure using childhood criminal predictors. After eliminating variables based on the aforementioned criteria, four criminal predictors were entered

Table 3.4

Cross Tabulation of Adolescent Criminal Predictors across the Four Trajectory Groups.

Criminal Predictor	Trajectory Group				$\chi^2(df)$
	MR ^a (<i>n</i> = 82)	LR ^b (<i>n</i> = 246)	HRADL ^c (<i>n</i> = 29)	HRADOL ^d (<i>n</i> = 21)	
Low intelligence or poor academic achievement	68.4	60.7	72.4	50.0	4.04(3)
Hyperactivity-impulsivity-inattention	32.9	31.2	51.7	35.0	4.92(3)
Antisocial behaviour	91.1	85.0	89.7	85.0	2.18(3)
Callousness	26.6	32.9	41.4	45.0	3.70(3)
Lacks responsibility or accountability	48.1	44.9	51.7	40.0	.93(3)
Alcohol and/or drug use	70.9	57.3	75.9	65.0	7.32(3)
Health problems	10.1	13.2	13.8	15.0	.66(3)
Low self-esteem	26.6	26.9	27.6	20.0	.47(3)
Extra-familial sexual abuse	3.8	3.0	.0	.0	1.75(3)
Criminal family members	20.3	9.8	20.7	25.0	9.13(3)*
Parental psychopathology	8.9	13.7	13.8	10.0	1.42(3)
Poor child-rearing methods	30.4	35.0	31.0	20.0	2.27(3)
Familial abuse	11.4	16.7	3.4	5.0	5.91(3)
Relationship difficulties	44.3	43.6	41.4	45.0	.09(3)
Broken home or family transitions	44.3	38.5	51.7	15.0	7.71(3)
Involvement with alternative care	50.6	45.3	65.5	60.0	5.50(3)
Poor relations with peers	50.6	65.0	55.2	45.0	7.44(3)
Poor behaviour towards school	67.1	59.8	58.6	40.0	5.02(3)

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

p* ≤ .05, *p* ≤ .01, ****p* ≤ .001

into the childhood model to test their relationship to the four criminal trajectories, including antisocial behaviour, relationship difficulties, broken home or family transitions (or “broken home”), and involvement with alternative care. The overall model was significant ($\chi^2(6) = 20.14$, *p* = .003), with broken home and involvement with alternative care significantly contributing to the model. The proportion of variance in trajectory group membership, as measured by the Nagelkerke pseudo *R*² statistic, was 6.3% and the classification accuracy of the model 64.6%.

Table 3.5

Cross Tabulation of Adolescent Protective Factors across the Four Trajectory Groups.

Protective Factor	Trajectory Group				$\chi^2(df)$
	MR ^a (n = 82)	LR ^b (n = 246)	HRADL ^c (n = 29)	HRADOL ^d (n = 21)	
Average to high intelligence or academic achievement	15.2	15.0	17.2	10.0	.51(3)
Effective use of leisure time	29.1	38.5	31.0	20.0	4.62(3)
Positive response to authority	3.8	17.9	10.3	.0	13.90(3)**
Experienced remorse or guilt for actions	5.1	9.8	3.4	5.0	3.05(3)
Parental nurturance	15.2	16.7	6.9	10.0	2.36(3)
Positive child-rearing methods	3.8	2.6	.0	.0	1.82(3)
Family cohesion	3.8	10.7	3.4	5.0	5.04(3)
Positive peer relations	2.5	6.8	.0	5.0	3.97(3)
Positive regard for school	1.3	8.5	6.9	5.0	5.15(3)

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

The LR trajectory group served as the base reference group for this analysis.

In childhood, when broken home was present, the offenders were more likely to belong to the MR group than the LR group (OR = 1.82, CI = 1.03 – 3.22). In the presence of involvement with alternative care, offenders were more likely to belong to one of the high rate offending groups, specifically either the HRADL group (OR = 3.14, CI = 1.33 – 7.39) or the HRADOL group (OR = 3.82, CI = 1.40 – 10.49).

Adolescent criminal predictor model. Table 3.7 shows the results of the backward stepwise procedure using adolescent criminal predictors. After eliminating predictors that did not meet criteria for the analysis, seven criminal predictors were entered into the adolescent model, including HIA, criminal family members, familial abuse, broken home, involvement with alternative care, poor peer relations, and poor behaviour towards school. The backward stepwise procedure generated a significant model ($\chi^2(15) = 43.12, p = .001$) comprised of the following

Table 3.6

Backward Stepwise Analysis of Trajectory Group Membership as a Function of Childhood Criminal Predictors (Base Reference Group is the Low Rate Trajectory Group).

Comparison	Criminal Predictor	B	SE	Odds Ratio	Wald
MR ^a vs. LR ^b	Broken home or family transitions	.60	.29	1.82	4.22*
	Involvement with alternative care	.16	.28	1.17	.30
	Intercept	-1.50	.23		43.84
HRADL ^a vs. LR ^b	Broken home or family transitions	-.04	.44	.96	.01
	Involvement with alternative care	1.14	.44	3.14	6.85*
	Intercept	-2.62	.36		53.61
HRADOL ^a vs. LR ^b	Broken home or family transitions	-.81	.51	.45	2.49
	Involvement with alternative care	1.34	.52	3.82	6.74*
	Intercept	-2.70	.38		49.37

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

*= $p \leq .05$, **= $p \leq .01$, ***= $p \leq .001$

predictors: criminal family members, familial abuse, broken home, involvement with alternative care, and poor peer relations. The Nagelkerke pseudo R^2 statistic showed that the proportion of variance in trajectory group membership accounted for by these variables was 13.1%, and the overall classification accuracy of the model was 65.2%. The LR trajectory group served as the base reference group for this analysis.

In the presence of criminal family members, offenders were more likely to belong to the MR group (OR = 2.83, CI = 1.37 – 1.5.87), the HRADL group (OR = 3.09, CI = 1.08 – .8.82), or the HRADOL group (OR = 4.51, CI = 1.39 – 14.62). Poor peer relations predicted membership in the LR group compared to the MR group (OR = .50, CI = .30 – .86) and the HRADOL group (OR = .38, CI = .15 – 1.00). When offenders experienced involvement with alternative care, they were more likely to belong to one of the high rate offending groups, specifically either the

Table 3.7

Backward Stepwise Analysis of Trajectory Group Membership as a Function of Adolescent Criminal Predictors (Base Reference Group is the Low Rate Trajectory Group).

Comparison	Criminal Predictor	β	SE	Odds Ratio	Wald
MR ^a vs. LR ^b	Involvement with alternative care	.25	.28	1.28	.81
	Familial abuse	-.67	.42	.51	2.56
	Criminal family members	1.04	.37	2.83	7.86**
	Broken home or family transitions	.30	.28	1.35	1.14
	Poor relations with peers	-.69	.27	.50	6.43*
	Intercept	-.99	.25		15.96
HRADL ^a vs. LR ^b	Involvement with alternative care	.87	.43	2.38	4.08*
	Familial abuse	-2.12	1.05	.12	4.07*
	Criminal family members	1.13	.54	3.09	4.45*
	Broken home or family transitions	.51	.42	1.66	1.48
	Poor relations with peers	-.54	.41	.58	1.73
	Intercept	-2.45	.42		33.59
HRADOL ^a vs. LR ^b	Involvement with alternative care	1.02	.50	2.76	4.10*
	Familial abuse	-1.57	1.08	.21	2.11
	Criminal family members	1.51	.60	4.51	6.31*
	Broken home or family transitions	-1.35	.66	.26	4.13*
	Poor peer relations	-.97	.49	.38	3.84*
	Intercept	-2.23	.43		26.30

Note. ^aMR = Moderate rate offender group. ^bLR = Low rate offender group. ^cHRADL = High rate adult-peaked offender group. ^dHRADOL = High rate adolescence-peaked group.

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

HRADL group (OR = 2.38, CI = 1.03 – 5.53) or the HRADOL group (OR = 2.76, CI = 1.03 – 7.37), relative to the LR group. Offenders were more likely to belong to the LR group, compared to the HRADL group, when familial abuse occurred in adolescence (OR = .12, CI = .02 – .94). Last, when youths experienced a broken home, they were more likely to be in the LR group compared to the HRADOL group (OR = .26, CI = .07 – .95).

Discussion

The purpose of this thesis was to examine the relationship between predictors of criminal behaviour occurring in childhood and adolescence and the four offending trajectories identified by Day et al. (2008). The association between childhood and adolescent protective factors and Day et al.'s criminal trajectories also was explored. Overall, the results of the study provided support for the distinction of the four trajectory groups.

Differentiating the Four Trajectory Groups

The first hypothesis tested whether the HRADL trajectory group had significantly more broad criminal predictors across childhood and adolescence compared to the LR, MR, and HRADOL groups. The second hypothesis sought to determine whether the LR group had a significantly fewer number of broad criminal predictors in childhood and adolescence compared to the other groups. Contrary to expectation, there were no differences among the four groups for the total number of criminal predictor items in childhood, in adolescence, and in childhood and adolescence combined.

Although there is research to support the notion that an accumulation of risk factors increases the likelihood of serious and persistent offending within community samples (Farrington, 2002; Rutter, 1985), research on the effect of cumulative risk in high risk samples and on the differences in cumulative risk between community and high risk samples is lacking. Given that the current study sampled from the offender population, the lack of differentiation for predictors across the four trajectory groups may have resulted from an overall high base rate of risk factors across the four groups.

Savage (2009) observed that a majority of factors measured in cumulative risk studies have minor effects, including size of the family, family support, education, and single-parent

families. While it is intuitive that an increased number of risk factors results in a higher likelihood of criminality, an accumulation of weak factors causing a serious disturbance in psychosocial functioning, or criminal behaviour, is not. Rather, significant life events, such as neurological damage, severe trauma experiences, or extreme social adversity, may have an impact on whether a youth develops serious and persistent offending behaviour. Further investigations utilizing clear operational definitions and quantifications of criminal predictors are required to confirm whether this is the case, however. Also, this effect needs to be examined in both community and high risk samples of youth who engage in delinquent behaviour.

Another possible explanation for the aforementioned finding is that certain factors only have a specific effect when in the presence of, or in combination with, other factors. For example, Rutter (1985) found that, individually, family discord, parental mental disorder, and other factors did not relate to psychiatric risk. However, when the factors were combined with one another, a relationship to psychiatric risk occurred. The current study did not measure the strength of each predictor, or the timing of and relationship between predictors, which may have resulted in a loss of information and, consequently, an effect on the outcome variable.

The third research question addressed whether the HRADL group would have a greater number of low intelligence or poor academic achievement, hyperactivity-impulsivity-inattention (HIA), and familial abuse predictor items in childhood compared to the other three trajectory groups. Although testing found significant differences among the trajectory groups for the number of low intelligence or poor academic achievement items, post-hoc analyses did not locate differences among the groups. This finding may have been due to small sample sizes in some of the trajectory groups. However, the HRADL group means were larger than those of the LR group, which showed a trend in the direction of the expected outcome. In applying Moffitt's

(1993) theory of developmental taxonomy, the results of the HRADL group are comparable to the life-course-persistent (LCP) offender group who experience compromised cognitive functioning. Other studies have found that school problems (Maguin & Loeber, 1996; Farrington, 1989) predict subsequent delinquency and adult offending. Since group differences were not confirmed, however, the above analyses should be replicated with trajectory groups larger or more equivalent in sample size.

No differences were found among the trajectory groups for the number of HIA and familial abuse items. This finding is inconsistent with Moffitt's (1993) theory, which states that individuals in the LCP offender group experiences neurological deficits and family adversity, including child maltreatment. However, Leschied et al. (2008) noted that childhood factors only modestly related to future offending and that, the older a child is at the time of experiencing a risk factor, the more reliably the factor related to adult criminality. Similarly, Thornberry et al. (2004) found that maltreatment occurring in adolescence was a stronger and more substantial predictor of subsequent criminal behaviour compared to its presence in childhood only. More research is needed to understand low intelligence, poor academic achievement, and familial abuse in the context of an offender-based population.

The fourth research question examined whether the LR group had a significantly greater number of peer-related items and fewer familial abuse items in adolescence compared to the HRADL trajectory group. The LR group was found to have a greater number of peer-related items compared to the MR group, but not the HRADL group, and the LR group had a greater number of familial abuse items than the HRADL group.

Although the MR group differed from the HRADL group in frequency of offending ($M = 32.1$ and $M = 84.7$, respectively), the persistence in offending between the two groups was very

similar. The mean criminal career length for the MR and HRADL groups was 12 and 12.1, respectively (Day et al., 2008). Therefore, given the similarity between the MR and HRADL groups, the MR group may resemble Moffitt's (1993) LCP offender group. This similarity may explain the differences in peer items between LR and MR groups since the LR group is representative of Moffitt's adolescent-limited (AL) offending group.

The finding that familial abuse differentiates the LR group from the HRADL group may suggest that the LR group is at risk for mental health problems rather than criminal behaviour. This group was found to have the greatest number of psychiatric disorders ($M = 1.33$) compared to the MR ($M = .95$), HRADL ($M = .48$), and HRADOL ($M = .81$) groups (Day et al., 2008), and, as previously mentioned, the LR group did not differ from the other groups in the total number of criminal predictor items. The relationship between child maltreatment and the development of mental health problems is well-supported in the literature (Kaplan, Pelcovitz, & Labruna, 1999; McCloskey & Walker, 2000; Wolfe, Scott, Wekerle, & Pittman, 2000), and research has found that child maltreatment and psychiatric diagnosis are related to offending (Fergusson, Horwood, & Lynskey, 1997). However, the current study's findings are limited since the timing of the occurrence of familial abuse, relative to the onset of psychiatric disorder, could not be confirmed. This relationship requires clarification in future research studies.

Predictors of Trajectory Group Membership

Among the childhood variables, the experience of alternative care predicted membership in one of Day et al.'s (2008) high rate offending trajectories. Specifically, a youth was over three times more likely to be in the HRADL group and nearly four times more likely to be in the HRADOL group if he was involved with alternative care as a child. A similar effect was found for those who experienced child welfare contact in adolescence; offenders were over twice as

likely to belong to the HRADL group and nearly three times as likely to belong to the HRADOL group. These findings converge with the results of a study by Ryan and Testa (2005), who found that children placed in substitute care, relative to those who stayed in the family home, had an increased likelihood of engaging in delinquency. These findings are also in line with Moffitt's (1993) LCP offender group in terms of the experience of family adversity and high rate offending.

Children are often removed from the family home as a result of experiencing frequent and severe abuse, previous (lack of) response to services, and a higher likelihood of recurrence of abuse (Britner & Mossler, 2002). It is thought that the severe conditions within the home environment impedes normative, healthy development in children and increases the likelihood of subsequent adverse outcomes. Belsky's (1980) theory of understanding child maltreatment considers the influence of both psychological and sociological factors on parenting practices. Parenting practices are said to be shaped by child, parent, and contextual factors. Similarly, Pecora, Whittaker, Maluccio, and Barth (2000) proposed an ecological theory for understanding maltreatment whereby the abuse or neglect of youths may be best conceptualized as an expression of an unraveling series of problems originating in the context of the family and in the broader environment of the child (e.g., in school, peer relations, community or culture).

Also, from the set of childhood variables, broken home or family transitions was predictive of moderate rate offending. In particular, when a youth experienced a broken home in childhood, he was nearly twice as likely to belong to the MR offending group. Life-course theories explain the association between broken homes and delinquency by considering separation as a series of stressful events that may include marital conflict, loss of a parent, compromised economic circumstances, changes in parental figures, and poor family management

practices (Farrington & West, 2007). Empirical support for this theory was found by Juby and Farrington (2001). In their study, boys from broken homes engaged in a greater amount of delinquency than boys from intact homes, and boys who lived with their mothers after parental separation had the same delinquency rate as boys from intact low-conflict families. Additionally, boys who remained with relatives or other caregivers (e.g., foster parents) had high rates of delinquency.

During adolescence, the presence of criminal family members in a youth's life was predictive of moderate to high rate offending. Specifically, youths were nearly three times more likely to be in the MR group, over three times more likely to be in the HRADL group, and four and a half times more likely to be in the HRADOL group. Family criminality, as well as a positive familial attitude toward crime, has been shown to increase the risk of delinquency among adolescents (Baker & Mednick, 1984; Farrington, 1989).

The processes underlying the transmission of familial criminality are unclear, however. Henggeler (1989) noted that, while modeling antisocial and aggressive behaviour is likely a part of the offspring's socialization process, criminal parents rarely involve their children in their offending. Henggeler suggested that criminal parents may have interpersonal and cognitive deficits that impact their parenting practices. The delinquent behaviour of the adolescent may be related to ineffective parenting and poor relations between the parent and youth. Other research (Mednick, Gabrielli, & Hutchings, 1983) has found evidence of a genetic component in the transmission of criminality.

According to Hawkins (1996), siblings may serve as a transmission of criminal knowledge for one another. Similar to peers, siblings may be closer in age and interact more intimately. They may observe and learn delinquent acts from each other, or participate in

criminal acts together. Rowe and Rodgers (1989) reported that twins and siblings who were in frequent contact were more likely to offend with one another. While the processes of sibling influence on one another is not well understood, Patterson (1986) suggested that this process may begin with the siblings fighting and coercing one another, which increases their antisocial behaviour. Rowe and Gulley (1992) have suggested that sibling co-offending may relate to a mutual imitation process that may be positively reinforced by one another.

Although none of the childhood variables predicted low rate offending, the experience of poor peer relations, familial abuse, or a broken home in adolescence was associated with membership in the LR group. The finding that poor peer relations predicted low rate offending is congruent with Moffitt's (1993) AL group; however, the latter two findings are not. Research has found that child maltreatment occurring before age 18 is a risk factor for general maladaptive outcomes (Smith & Thornberry, 1995; Stouthamer-Loeber, Loeber, Homish, & Wei, 2001; Widom, 1989; Zingraff, Leiter, Myers, & Johnsen, 1993). As previously mentioned, given the high rate of psychiatric disorders and criminal predictors in this group, as well as the relatively short span of the LR group's criminal career ($M = 6.7$; Day et al., 2008), the LR offenders may be experiencing significant problems with mental health rather than offending.

With regard to the experience of a broken home, Wells and Rankin (1986) argue that, due to its complexity in definition, the variable should not be reduced to dichotomization. The authors comment that the literature on broken homes and delinquency is largely incomplete as a result of the oversimplification of its measurement. As such, further research carefully measuring this variable is needed to aid in its understanding with criminality.

Leschied et al. (2008) concluded that, in general, risk factors measured in adolescence are strong and reliable predictors of adult offending, while predictors occurring in childhood were

weaker predictors. The authors found that family structure variables, including parental separation, marital status, and child welfare involvement, were particularly strong predictors when they occurred in adolescence. Also, Leschied et al. noted that, based on the review by Borum (2000), their findings from the meta-analysis were in accordance with the cross-sectional literature on the causes and correlates of criminality. Taken together, the results of previous research provide converging evidence and support for the findings in the present study.

Limitations of the Thesis

It is important to discuss the limitations of the present thesis. First, the criminal predictors and protective factors were coded as either 'Yes/Suspected' or 'Unknown.' Whether a factor was absent because the youth had not experienced it, or because the factor was not mentioned in the documents on file, could not be confirmed. Rarely, if ever, was a factor confirmed to be absent in a youth's life and, given the extremely low base rate, this occurrence was not measured. A prospective longitudinal design may correct for this experience by measuring the occurrence of and change in variables across time.

Second, the design of the study was cross-sectional, with the criminal predictors and protective factors coded as present or absent across two developmental periods defined as childhood (i.e., age 0 to 12) and adolescence (i.e., age 13 to 19). Aside from the use of these two coding schemes, the limited information available in the client files made it impossible to measure any form of change in the criminal predictors and protective factors across time beyond an assignment of present or absent. Again, a prospective longitudinal study measuring criminal predictors and protective factors at equal intervals across time would capture within-subject changes and determine the effects of different levels of risk and/or protective exposure.

Third, information on the sample's demographic characteristics, such as socioeconomic status and ethnicity, was not readily available or clearly stated in the files. For example, while the skin colour of the offender was often stated on the open custody facility's intake form, the ethnicity of the youth was not. As well, females were not included in the thesis since the open custody facilities were male-specific. Blumstein, Cohen, Roth, and Visser (1986) noted that demographic factors, including age, ethnicity, and sex, have strong relationships to participation in crime but are weakly associated with individual crime frequency. Statistically controlling for demographic variables may result in a loss of effects of risk factors. As such, it is important to replicate this study with the addition of demographic variable measures.

Fourth, alcohol and substance use occurring in adolescence neither differentiated the trajectory groups nor predicted group membership. Alcohol and substance use have been found in several studies as predictors of onset and maintenance for delinquency and adult criminality (Brook, Whiteman, Finch, & Cohen, 1996; Dembo et al., 1995; Loeber & Hay, 1997; Loeber & Stouthamer-Loeber, 1987). A lack of significant findings for this variable may have resulted from a limitation of the study's design. For example, frequency and persistence of alcohol and substance use could not be determined, nor could abuse or dependence be confirmed. Finally, significant life events (e.g., death of a family member) and suicidal behaviour were not coded, although it appeared that these factors were somewhat common among the sample and may have related to either the criminal trajectories or psychiatric diagnoses.

Policy and Practice Implications

Although further investigations are required to confirm causal relationships between the variables and outcome measured in this study, the results suggest that there are, in the population of young people at high risk for delinquency and criminality, subgroups of children and youths

who have distinct targets and needs for the prevention and intervention of delinquency. For example, children at high risk for persistent delinquency and adult criminality may require interventions targeting the effects of a broken home, difficult transitions, or child welfare contact. Adolescents who experience maltreatment, a broken home, or difficulties with peers appear to be at risk for lower rate offending. Interventions for this population may focus on building prosocial skills in the youths as well as on healthy interactions and parenting practices in the family unit. Day et al. (2008) noted that the intervention needs of adolescents with court contact may be best served outside of the juvenile justice system.

Future Directions for Research

A strong theoretical basis for the study of the development and persistence of criminal behaviour is lacking. In 1988, Farrington commented that investigators in the field had not sufficiently attempted to understand the effect of life events on the course of development, or with advancing and testing theories of the development of delinquency. The atheoretical approach to studying delinquency and criminality has continued to persist in the field. Additionally, many experimental interventions for antisocial behaviour and delinquency do not have a solid theoretical grounding, as experimental predictions originating in theory are the exception rather than the rule (Farrington). Developing and integrating biopsychosocial or social-ecological theories into research on delinquency may provide a multidimensional perspective for understanding antisocial and offending behaviour.

An understanding of the processes behind the overrepresentation of relocated youths in the juvenile justice system is not well understood at this point in time. Little is known about their criminogenic needs, their trajectories of offending, and the factors related to the onset and maintenance of their trajectories (Ryan, Hernandez, & Herz, 2007). The influence of criminal

parents and siblings on a youth's delinquency should be further investigated as well, given their relationship to persistent offending. Additionally, research is needed to understand the factors of high risk children and adolescents who commit offenses at a low rate.

Further investigations are required to determine what the risk factors are for specific dimensions of the criminal trajectory, such as persistence, frequency, and escalation of offending (Farrington & Welsh, 2007), as well as how these factors change in type and degree across the different developmental stages of youth who persistently engage in criminal behaviour. As the risks and needs of high risk youths may differ from community youths, prospective longitudinal studies using high risk samples are needed.

As well, the mechanisms underlying resiliency require further investigation. Few studies of criminal trajectories have incorporated measures of resiliency, protective or promotive influences, or competence. Similarly, the factors related to desistance from criminal behaviour are not well understood. While the factors of desistance were not a focus of the current thesis, a low base rate of protective factors in both childhood and adolescence was noted in the sample's client files. Whether the low base occurred as a result of those interviewing the youth underreporting or overlooking such factors, or whether they simply did not occur in the youths' lives, is unknown. Future research should measure the influence of these factors on antisocial behaviour and delinquency across time.

Appendix A

ID: _____

Date: _____

DOB: _____

Childhood Criminal Predictor Coding Scheme

Source(s) of information: Predisposition report: _____ Psychiatric notes: _____ Discharge report: _____
 Psychological assessment(s): _____ YMA: _____ Other: _____
 Psychiatric assessment(s): _____ Plan of care: _____

Individual factors

Yes/Suspected

Unknown

1. Low intelligence or poor academic achievement

Low intelligence

Learning disability

Enrolled in special education classes

General academic-related difficulties

Failed or repeated grade (grade: _____)

2. Hyperactivity-impulsivity-inattention

Attention or concentration difficulties/easily distracted

Restless

Cannot wait or take turns

Hyperactive/very active/energetic

Difficulty planning ahead

Acted on impulse

ADD diagnosis

ADHD diagnosis

3. Antisocial behaviour

Uses inappropriate language (e.g., swearing, sexual talk)

Defiant towards set rules or authority figures

Quick to anger

Temper tantrums

Verbally aggressive

Physically aggressive

Sexually precocious

Engaged in inappropriate sexual behaviour

Lying

Manipulative

Runs away

Harmful toward animals

Vandalized (e.g., destroyed property, graffiti)

Stealing

Break and enter (e.g., buildings, cars)

Fire setting behaviour

Gang member

Poor behaviour not specified

	<u>Yes/Suspected</u>	<u>Unknown</u>
4. <u>Alcohol and/or drug use</u>		
Alcohol	_____	_____
Drugs (specify: _____)	_____	_____
Drugs unspecified	_____	_____
5. <u>Health problems</u>		
Traumatic Head Injury (type: _____)	_____	_____
Seizure(s)	_____	_____
Invasive surgery (specify: _____)	_____	_____
Early ear infections	_____	_____
Enuresis	_____	_____
Encopresis	_____	_____
Obesity	_____	_____
Hygiene problems	_____	_____
Other health problem(s) (specify: _____)	_____	_____
6. <u>Low self-esteem</u>	_____	_____
7. <u>Extra-familial sexual abuse</u>	_____	_____

Family factors

1. <u>Criminal family members</u>		
Criminal mother	_____	_____
Criminal father	_____	_____
Criminal sibling	_____	_____
2. <u>Parental psychopathology</u>		
Mental health difficulties – mother	_____	_____
Mental health difficulties – father	_____	_____
Psychiatric hospitalization – mother	_____	_____
Psychiatric hospitalization – father	_____	_____
Alcohol and/or drug use – mother	_____	_____
Alcohol and/or drug use – father	_____	_____
Prenatal drinking or drug use	_____	_____
3. <u>Poor child-rearing methods</u>		
Authoritarian or harsh discipline	_____	_____
Lax discipline	_____	_____
Inconsistent discipline	_____	_____
Poor parental supervision	_____	_____
Poor parental management skills	_____	_____
Abandonment of child	_____	_____

	<u>Yes/Suspected</u>	<u>Unknown</u>
4. <u>Familial abuse</u>		
Physically abused	_____	_____
Sexually abused	_____	_____
Verbally/emotionally abused	_____	_____
Neglected	_____	_____
Witnessed physical abuse	_____	_____
Witnessed sexual abuse	_____	_____
Witnessed verbal/emotional abuse	_____	_____
5. <u>Relationship difficulties</u>		
Poor relations among family members	_____	_____
Family discord	_____	_____
Low family cohesion/stability	_____	_____
6. <u>Broken home or family transitions</u>		
Parental separation	_____	_____
Parental divorce	_____	_____
Single parent	_____	_____
Parental re-marriage	_____	_____
Frequent moving (i.e., residences, schools)	_____	_____
Frequent change in parental figures or partners	_____	_____
7. <u>Involvement with alternative care</u>		
Child welfare agency	_____	_____
Foster care	_____	_____
Adopted	_____	_____
Other institutional involvement (specify: _____)	_____	_____
8. <u>Teenage mother (age 17 or younger at childbirth)</u>	_____	_____

Peer factor

Poor relations with peers

Poor ability to socialize with peers	_____	_____
Difficulty relating to peers	_____	_____
Peer rejection	_____	_____
Easily influenced by peers	_____	_____
Unwilling to associate with prosocial peers	_____	_____
Negative peer association	_____	_____
Criminal peers	_____	_____

School factor

Poor regard for school

Lack of academic motivation or interest	_____	_____
Truant	_____	_____
Suspended	_____	_____
Expelled	_____	_____

Appendix B

Childhood Protective Factor Coding Scheme

<i>Individual factors</i>	<u>Yes/Suspected</u>	<u>Unknown</u>
1. <u>Average to high intelligence or academic achievement</u>		
Average intelligence	_____	_____
Superior intelligence	_____	_____
Reasonable academic achievement	_____	_____
Superior academic achievement	_____	_____
2. <u>Effective use of leisure time</u>		
Involvement in sports	_____	_____
Involvement in other prosocial activities	_____	_____
3. <u>Positive response to authority (e.g., home, school)</u>	_____	_____
<i>Family factors</i>		
1. <u>Parental nurturance</u>	_____	_____
2. <u>Positive discipline techniques</u>		
Authoritative discipline	_____	_____
Use of appropriate techniques (e.g., grounding, withdrawing privileges, etc.)	_____	_____
3. <u>Family cohesion</u>		
Family members are close	_____	_____
Family members express good communication	_____	_____
Family participates in activities together	_____	_____
<i>Peer factor</i>		
<u>Positive peer relations</u>		
Positive peer association	_____	_____
Well-liked by peers	_____	_____
<i>School factor</i>		
<u>Positive regard for school</u>	_____	_____

Appendix C

ID: _____

Date: _____

DOB: _____

Adolescent Criminal Predictor Coding Scheme

Source(s) of information: Predisposition report: _____ Psychiatric notes: _____ Discharge report: _____
 Psychological assessment(s): _____ YMA: _____ Other: _____
 Psychiatric assessment(s): _____ Plan of care: _____

Individual factors

Yes/Suspected

Unknown

1. Low intelligence or poor academic achievement

Low intelligence

Learning disability

Enrolled in special education classes

General academic-related difficulties

Dropped out of school (last grade completed: _____)

2. Hyperactivity-impulsivity-inattention

Attention or concentration difficulties/easily distracted

Restless

Cannot wait or take turns

Hyperactive/very active/energetic

Difficulty planning ahead

Acted on impulse

ADD diagnosis

ADHD diagnosis

3. Antisocial behaviour

Uses inappropriate language (e.g., swearing, sexual talk)

Defiant towards set rules or authority figures

Quick to anger

Verbally aggressive

Physically aggressive

Engaged in inappropriate sexual behaviour

Lying

Manipulative

Runs away

Harmful toward animals

Vandalized (e.g., destroyed property, graffiti)

Stealing

Break and enter (e.g., buildings, cars)

Fire setting behaviour

Gang member

Poor behaviour not specified

	<u>Yes/Suspected</u>	<u>Unknown</u>
4. <u>Callousness</u>		
Shallow affect	_____	_____
Lacks empathy	_____	_____
Lacks remorse or guilt	_____	_____
5. <u>Lacks responsibility or accountability</u>	_____	_____
6. <u>Alcohol and/or drug use</u>		
Alcohol	_____	_____
Hallucinogens (e.g., marijuana, psilocybin, LSD, MDMA, ketamine, mescaline, salvia, PCP)	_____	_____
Stimulants (e.g., cocaine, crack cocaine, amphetamine, methamphetamine, methylphenidate, dexedrine)	_____	_____
Opiates (e.g., oxycontin, percocet, codeine, morphine, heroin, opium, methadone)	_____	_____
Other depressants (e.g., barbiturates, benzodiazepines, GHB)	_____	_____
Other drugs (specify: _____)	_____	_____
Drugs not specified	_____	_____
7. <u>Health problems</u>		
Traumatic Head Injury (type: _____)	_____	_____
Seizure(s)	_____	_____
Enuresis	_____	_____
Encopresis	_____	_____
Hygiene problems	_____	_____
Other health problem(s) (specify: _____)	_____	_____
8. <u>Low self-esteem</u>	_____	_____
9. <u>Extra-familial sexual abuse</u>	_____	_____

Family factors

1. Criminal family members

Criminal mother	_____	_____
Criminal father	_____	_____
Criminal sibling	_____	_____

2. Parental psychopathology

Mental health difficulties – mother	_____	_____
Mental health difficulties – father	_____	_____
Psychiatric hospitalization – mother	_____	_____
Psychiatric hospitalization – father	_____	_____
Alcohol and/or drug use – mother	_____	_____
Alcohol and/or drug use – father	_____	_____

	<u>Yes/Suspected</u>	<u>Unknown</u>
3. <u>Poor child-rearing methods</u>		
Authoritarian or harsh discipline	_____	_____
Lax discipline	_____	_____
Inconsistent discipline	_____	_____
Poor parental supervision	_____	_____
Poor parental management skills	_____	_____
Abandonment of child	_____	_____
4. <u>Familial abuse</u>		
Physically abused	_____	_____
Sexually abused	_____	_____
Verbally or emotionally abused	_____	_____
Neglected	_____	_____
Witnessed physical abuse	_____	_____
Witnessed sexual abuse	_____	_____
Witnessed verbal or emotional abuse	_____	_____
5. <u>Relationship difficulties</u>		
Poor relations among family members	_____	_____
Family discord	_____	_____
Low family cohesion or stability	_____	_____
6. <u>Broken home or family transitions</u>		
Parental separation	_____	_____
Parental divorce	_____	_____
Single parent	_____	_____
Parental re-marriage	_____	_____
Frequent moving (i.e., residences, schools)	_____	_____
Frequent change in parental figures or partners	_____	_____
7. <u>Involvement with alternative care</u>		
Child welfare agency	_____	_____
Foster care	_____	_____
Adopted	_____	_____
Other institutional involvement (specify: _____)	_____	_____

Peer factor

Poor relations with peers

Poor ability to socialize with peers	_____	_____
Difficulty relating to peers	_____	_____
Peer rejection	_____	_____
Easily influenced by peers	_____	_____
Unwilling to associate with prosocial peers	_____	_____
Negative peer association	_____	_____
Criminal peers	_____	_____

Yes/Suspected

Unknown

School factor

Poor regard for school

Lack of academic motivation or interest

Truant

Suspended

Expelled

Appendix D

Adolescent Protective Factor Coding Scheme

<i>Individual factors</i>	<u>Yes/Suspected</u>	<u>Unknown</u>
1. <u>Average to high intelligence or academic achievement</u>		
Average intelligence	_____	_____
Superior intelligence	_____	_____
Reasonable academic achievement	_____	_____
Superior academic achievement	_____	_____
2. <u>Effective use of leisure time</u>		
Involvement in sports	_____	_____
Involvement in other prosocial activities	_____	_____
3. <u>Positive response to authority (e.g., home, school)</u>	_____	_____
4. <u>Has remorse or guilt for actions</u>	_____	_____
<i>Family factors</i>		
1. <u>Parental nurturance</u>	_____	_____
2. <u>Positive discipline techniques</u>		
Authoritative discipline	_____	_____
Use of appropriate techniques (e.g., grounding, withdrawing privileges, etc.)	_____	_____
3. <u>Family cohesion</u>		
Family members are close	_____	_____
Family members express good communication	_____	_____
Family participates in activities together	_____	_____
<i>Peer factor</i>		
<u>Positive peer relations</u>		
Positive peer association	_____	_____
Well-liked by peers	_____	_____
<i>School factor</i>		
<u>Positive regard for school</u>	_____	_____

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