Bringing psychopathy into research on offending trajectories: Understanding the construct's role as a barrier to desistance

by

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Abstract

Traditional longitudinal studies in criminology are not well-equipped to address questions concerning differences between chronic offenders and desisters because (a) these studies sampled from community-based populations where chronic offenders are rarely found and (b) these studies did not include the types of risk factors expected to differentiate chronic offenders from desisters. Indeed, there is a noted lack of research on the offending patterns of youth at the 'deep end' of the criminal justice system (Mulvey et al., 2004), and this type of sample is especially critical for studying desistance. Specific attention was given to the manner in which symptoms of psychopathy could be integrated into existing theories of desistance. To facilitate this line of analysis, data from the Incarcerated Serious and Violent Young Offender Study ($n = 326$) were used to perform three separate analyses using semi-parametric group based modeling (with exposure time accounted for). The three analyses captured chronic, serious, and violent offending trajectories from age 12 to 28. The characteristics of the individuals associated with these trajectories were described in order to better understand risk and protective factors associated with persistence and desistance. Specific attention was given to whether symptoms of psychopathy measured using the Psychopathy Checklist: Youth Version (PCL:YV) were informative of trajectory group association in each of the chronic, serious, and violent offending analyses. Theoretical and policy implications for the desistance process during emerging adulthood are discussed. There is a specific need for continued research using repeated measures of risk and protective factors within samples of high-risk offenders. The substance use literature's movement from abstinence-only treatment strategies to harm-reduction strategies may provide some helpful guidelines for criminal justice system practitioners distinguishing between high rate offenders recidivating as part of an escalation in the severity of their criminal career versus high rate offenders recidivating as part of a relapse in the desistance process.

Keywords: Criminal careers; desistance; developmental criminology; emerging adulthood; life course; offense severity; psychopathy; trajectories; violence

Dedication

My parents' strategy in raising me is perhaps the best argument that I can make against the assertion that early childhood development does not influence adult outcomes. I dedicate this dissertation to my parents, my first supervisors and mentors. Thanks for playing memory games with me, for forcing me to read for 30 minutes every night, for teaching chess to, for telling stories to me before bedtime, for looking over my homework, for raising me in an environment of puzzles, challenges, and tests of resiliency. Thanks for giving me the tools to achieve my goals, and, more importantly, the tools to move forward after failure.

Acknowledgements

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List of Acronyms

BIC   Bayesian Information Criteria

CAPP   Comprehensive Assessment of Psychopathic Personality

CORNET   Corrections Network Software

CSV   Chronic, Serious, and Violent

DLC   Developmental and Life Course

HRC   High-Rate Chronic

ISVYOS   Incarcerated Serious and Violent Young Offender Study

MCFD   Ministry of Child and Family Development

MLR   Multinomial Logistic Regression

OCC   Odds of Correct Classification

PCA   Principal Components Analysis

PCL: YV   Psychopathy Checklist: Youth Version

PPD   Psychopathic Personality Disturbance

SD   Standard Deviation

SPGM   Semi-parametric Group-based Modeling

SRC   Slow-Rising Chronic

ZIP   Zero-Inflated Poisson

Chapter 1.

The Importance of Desistance in Criminal Career Research and Directions Forward

Blumstein, Cohen, and Hsieh (1982) defined the criminal career as an individual's trajectory of offending from first to last offense. Embedded within this trajectory are a variety of important criminal career parameters including, but not limited to, onset/activation, persistence/aggravation, and desistance (Blumstein, Cohen, Roth, & Visher, 1986; Le Blanc & Loeber, 1998). This latter parameter is particularly important for practitioners working with high rate offenders (Kazemian, 2007; Laub & Sampson, 2001; Lussier, Corrado, & McCuish, 2015). Identifying factors that increase or decrease the likelihood of desistance may lead to more effective intervention strategies that ultimately shorten the length of an individual's criminal career (Farrington, 2007). If this is accomplished, the offender's quality of life improves, public safety is enhanced, and the financial cost to the criminal justice system is dramatically reduced (Cohen & Piquero, 2010). Despite its importance, desistance is the least well-studied criminal career parameter (Kazemian, 2007). Much of the existing data within criminology is not particularly well-suited for studying desistance because such research requires a combination of (a) data on the types of individuals that desistance theories are attempting to explain (i.e., offenders as opposed to non-offenders or non-frequent offenders, (b) data that extends through several developmental periods, and (c) data on the types of risk factors that help explain continued offending over these developmental stages (see Farrington, 2007).

The current dissertation addressed each of these requirements by using data on incarcerated adolescent male ($n = 262$) and female ($n = 64$) offenders. For this group, their criminal histories were measured from age 12-28, which meant that the data covered the periods of adolescence, emerging adulthood, and mature adulthood. As well, all offenders

were rated on symptoms of psychopathy measured using the Psychopathy Checklist: Youth Version (Forth, Kosson, & Hare, 2003). These three elements of the data were necessary to answer questions related to the timing and course of desistance amongst serious and violent offenders as well as answer questions about the types of risk factors that treatment providers must be particularly attuned to in order to promote desistance. The value of data on serious offenders that is longitudinal and contains the types of risk factors that can differentiate desisters and persisters is briefly described to further elucidate how the current dissertation contributes to the desistance literature.

Almost all longitudinal datasets within criminology are composed of individuals sampled from schools or low socio-economic status neighborhoods where offending is relatively uncommon (DeLisi, 2001). This emphasis on generalizability as opposed to understanding the types of individuals responsible for the majority of all crime is conducive to understanding the origins of criminal behavior, but it is not well-suited for research on desistance. Explanations of desistance require studying individuals involved in a level of crime at least "distinguishable from zero", meaning that desistance cannot be studied within samples of non-offenders or offenders involved in crime infrequently over the life course (Bushway, Piquero, Broidy, Cauffman, & Mazerolle, 2001, p. 505). Desistance-based policy recommendations emerging from community-based studies may therefore be of limited generalizability to the most chronic and serious offenders. The lack of data on the types of offenders that such policies are meant to address (i.e., those that pose the greatest concern to the criminal justice system) is understandable given the importance criminologists have given to research generalizability (DeLisi, 2001). However, a perhaps unintended consequence has been an almost complete absence of research on desistance among offenders at the 'deep end' of the criminal justice system (Mulvey et al., 2004).

Although the importance of understanding desistance from chronic offending was established over 40 years ago (Wolfgang, Figlio, & Sellin, 1972), explaining *why* this specific group does or does not desist has remained primarily theoretical (e.g., Corrado & Freedman, 2011; Le Blanc & Loeber, 1998; Moffitt, 1993; Patterson, Debaryshe, & Ramsey, 1989; Thornberry, 2004). The lack of associated research on offenders in the 'deep end' of the justice system is unfortunate for several reasons. Mainly, because this

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small group is responsible for the majority of all crimes committed (Wolfgang et al., 1972), these offenders represent the greatest concern for public safety and are most in need of treatment (Tolan & Gorman-Smith, 1998). These offenders also represent the largest financial cost to the criminal justice system (Cohen & Piquero, 2009; Cohen, Piquero, & Jennings, 2010; DeLisi, 2001; Mulvey et al., 2004).

The relatively small body of research on desistance (Kazemian, 2007) is also partially due to the challenges and costs associated with collecting longitudinal data capturing the period from adolescence through at least the early stages of adulthood (Farrington, 2007). The adolescence-adulthood transition is a critical phase of development, characterized by much change, and thus an important stage for intervention (Arnett, 2000). During this stage, several biological (see Corrado & Mathesius, 2014) and social (Laub & Sampson, 2003) changes occur which are expected to act as turning points that reduce involvement in offending (Arnett, 2000, 2001). Following offenders beyond early adulthood and into the period of mature adulthood ensures that sufficient time has passed for the offender to reach a level of maturity where turning points such as employment, marriage, and parenthood are expected. Moreover, given age-graded theories (Elder, 1985; Laub & Sampson, 1993), factors that promote desistance at one developmental stage are likely to differ from the factors that promote desistance at another developmental stage.

Clarifying which risk factors most strongly impede desistance and which protective factors most strongly promote desistance is also important for theory-building (Kazemian, 2007). If the factors that explain onset or persistence are different from factors that explain desistance, then general theories of crime (e.g., Gottfredson & Hirschi, 1990) may be unsuitable and consideration must be given to asymmetrical causation (see Uggen & Piliavin, 1998). Consideration must also be given to whether factors that influence the initiation and continuity of an individual's criminal career have a 'selection effect', which diminishes an individual's ability to (a) acquire factors that promote desistance or (b) benefit from the acquisition of these factors (Moffitt, 1993). For example, life events thought to influence desistance such as marriage, parenthood, or employment (Laub & Sampson, 203) may be less attainable for certain individuals characterized by neuropsychological deficits (Kazemian, 2007). An important empirical question centers on

identifying the types of individuals that do not seem to benefit from protective biological and environmental/social factors. For these individuals, addressing underlying pathology is likely necessary before considering a treatment or intervention approach that seeks to instil the types of turning points described in some desistance theories (e.g., Laub & Sampson, 2001).

Psychopathy is described as the most important risk factor to the criminal justice system (e.g., DeLisi, 2009; Hart, 1998); however, consideration of this construct has been limited to descriptions of its influence on the development of offending (Corrado, DeLisi, Hart, & McCuish, 2015). By ignoring this construct, a consequence to existing desistance theories is the failure to consider how symptoms of psychopathy may act as a barrier to desistance, meaning that symptoms of psychopathy may prevent an individual from experiencing a particular life event or prevent an individual from benefiting from a particular life event. From a policy perspective and for the benefit of practitioners, this is problematic, because the typical approach to treating offenders or to developing intervention strategies may be ineffectual, or will be more trying, when it comes to dealing with offenders characterized by high symptoms of psychopathy. Very importantly, focus within the current dissertation is not on testing whether symptoms of psychopathy lead to self-selection. Rather, consideration is given to (a) the manner in which principles from existing desistance theories are contradicted by the nature of the psychopathy construct, and (b) the manner in which psychopathy influences continued offending from adolescence through mature adulthood. This latter consideration is a necessary first step. Before examining whether psychopathy represents the type of neuropsychological deficit that will result in self-selection, it is necessary to illustrate the manner in which symptoms of psychopathy increase the likelihood of persistence versus desistance. This is a necessary starting point because (a) the extant criminal career research has either neglected psychopathy, incorrectly measured the construct, or incorrectly applied the construct (Corrado et al., 2015), and (b) if psychopathy is not associated with continued offending, then it is unnecessary to examine this construct's influence on self-selection.

As will be discussed in detail in Chapter Three, most desistance theorists tend to specify strategies for initiating desistance through a one-size-fits-all approach (e.g., Laub & Sampson, 2001). This approach more likely must consider, for example, the extent to

which a treatment provider may be misguided in their attempt to build informal social controls for an individual characterized by strong symptoms of psychopathy. At least from a conceptual point of view, emphasis on building informal social control may be a futile approach for individuals with strong symptoms of psychopathy, given that this type of individual by definition shows a lack of attachment to others, a disinterest in employment, and an unwillingness to change (Cooke, Hart, Logan, & Michie, 2004). Part of the explanation for why psychopathy is not really considered in the desistance literature and by criminologists more generally is because theories of desistance are rarely considered by individuals within the field of psychology, which is where the majority of research on the construct is conducted (Corrado et al., 2015). However, it is premature to consider the relationship between psychopathy and desistance without first providing a clear conceptualization of desistance.

1.1. Towards a more Nuanced Description of Desistance

The limited research on desistance is difficult to summarize and generalize because definitions of desistance, measures of desistance, and analytic strategies used to model desistance substantially vary across studies[1] (Kazemian, 2007; Lussier, McCuish, & Corrado, 2015). Desistance has traditionally been defined as the termination of offending, or the age at which an offender committed their last offense (Maruna, 2001; Maruna, Immarigeon, & Lebel, 2004). This definition of desistance was especially popular in early criminal career studies (Farrington, 1992; Farrington, Lambert, & West, 1998). However, more recent longitudinal research (e.g., Laub & Sampson, 2001; Maruna, 2001) specified that extending the length of the follow-up period in these earlier studies would have revealed that many 'desisters' continued to offend after the end of the initial follow-up period. Indeed, this research did not give enough weight to a very common parameter of the criminal career, intermittency (Kazemian, 2007). In response to this limitation, Maruna (2001) and others (e.g., Bushway, Paternoster, & Brame, 2003) called for definitions of desistance with greater specificity and an emphasis on the process of desistance rather than termination from offending itself (Bushway et al., 2001). By

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[1] There is also little consensus as to the most appropriate theoretical perspective on desistance (Lussier et al., 2015).

emphasizing desistance as a process, focus turns to monitoring within-individual changes in criminal behavior as opposed to between-group differences (Lussier, McCuish, & Corrado, 2015). Four existing definitions of desistance are reviewed to better understand their differences, strengths, and limitations. Specific attention is given to how trajectory methods can address problems with prior desistance research.

1.1.1.   Desistance as an Event

Desistance as an event is defined as the age at which an offender terminates their involvement in offending and then maintains this non-offending state over a specified, often arbitrary, period of time. This conceptualization is centered on the premise that desistance occurs abruptly, which as Maruna (2001) pointed out, can be problematic because the moment an individual completes an offense, s/he becomes an offender, but, at the same time, can also be defined as a desister (Maruna, 2001). By specifying the length of time that a non-offending state must be maintained, this conceptualization of desistance partially deals with Maruna's (2001) concern; however, a pervasive challenge within this conceptualization involves identifying a non-arbitrary length of time that the non-offending state must be maintained (Shover & Thompson, 1992). Generalizing findings from event-based desistance studies is difficult because the amount of time that an offender must maintain a crime-free state varies (Kazemian, 2007). For instance, in Kazemian and Farrington's (2012) review, desistance was measured as the absence of arrests in adulthood, the absence of arrests over two years, no self-reported involvement in offending in the last year, the absence of a conviction over 10 years, and so on.

Of additional consideration is whether the length of the non-offending state should vary across developmental stage. For example, given the age-crime curve, maintaining a non-offending state between the ages of 15-20 would be more unexpected than maintaining a non-offending state between ages 35-40. With new evidence of the importance of intermittency within criminal careers (Kazemian, 2007; Piquero, Farrington, & Blumstein, 2003; Sampson & Laub, 2005) and with some offenders spending long periods of time incarcerated (Kazemian & Travis, 2015), the risk of false negatives (i.e., 'false desisters') is concerning within event-based conceptualizations of desistance (Kazemian, 2007). Although desistance as an event may be the most subjective and

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simplistic of the difference conceptualizations (Lussier et al., 2015), simplicity also ensures that researchers can be confident that their measures adequately reflect their concepts. In forensic psychology, a similar but slightly more complex conceptualization of desistance is used. As opposed to complete termination, desistance is reflected by an offender's non-zero probability of re-offending over a specified time period.

1.1.2.   Desistance in Probabilistic Terms

Like traditional ordinal expressions of recidivism risk used in correctional psychology assessment tools (e.g., low, medium, high), likelihood of desistance can be expressed by dividing probabilities into discrete categories, with low probabilities indicating a high likelihood of desistance. Like traditional expressions of recidivism risk used in correctional psychology assessment tools (e.g., low, medium, high), likelihood of desistance is expressed by probabilities, with low probabilities indicating a high likelihood of desistance (Lussier, McCuish, & Corrado, 2015). This conceptualization is common within forensic psychology and is operationalized through measures of recidivism (e.g., re-arrest, re-entry into custody) that are then examined using various survival analysis techniques. These techniques can be used to examine both the probability of re-offending as well as the length of time to re-offense (Schmidt & White, 1989).

From an event-based perspective, the probability of re-offending among desisters is assumed to be zero. In contrast, a probabilistic conceptualization assumes that all offenders, including desisters, remain at some risk of re-offending (i.e., a non-zero probability) over the study period (Brame et al., 2003; Lussier et al., 2015; cf., Kurlychek, Bushway, & Brame, 2012). Even those that did not re-offend during the study period have a non-zero probability of re-offending, which helps address the problem of right-censoring in event based-conceptualizations. Unlike analytic strategies for the event-based conceptualization of desistance, survival methods adjust for an individual's time at-risk of offending to control for left-censoring (e.g., offenders with different release dates). Probabilistic methods also benefit from the ability to specify different polynomials to model the distribution of recidivism in a sample (Brame et al., 2003). Initial studies using survival analysis to study desistance modeled hazard rates using monotonic, or 'first degree', polynomials such as exponential and Weibull distributions (Schmidt & White, 1989). With

such models, the hazard rate is assumed to be constant, in that the hazard rate at time t +1 never exceeds the hazard rate at t (i.e., the immediately previous measurement period). However, models based on this assumption under-predicted recidivism during the initial stages of a follow-up period and over-predicted recidivism at later follow-up periods (Kurlychek et al., 2012). Non-monotonic or 'second degree' polynomials such as La Guerre or lognormal specify that recidivism distributions are characterized by one change in the direction of the hazard rate (e.g., a pattern where the hazard rate consistently declines followed by a pattern where the hazard rate consistently increases; Schmidt & White, 1989). According to Kurlychek et al. (2012) non-monotonic polynomials better captured recidivism distribution patterns because offenders typically do not re-offend immediately after release.

Kurlychek et al. (2012; also see Brame et al., 2003; Schmidt & White, 1989) argued that regardless of whether a first or second degree polynomial was specified, traditional survival analytic strategies wrongly assumed that all offenders eventually recidivate (i.e., the non-zero probability assumption). Split-population models, which can be monotonic or non-monotonic, offer a solution to this problem by specifying one group of offenders that are expected to never re-offend, regardless of the length of follow-up[2]. In effect, the split-population model can be viewed as a hybrid model examining both event and probabilistic-based conceptualizations of desistance. Here, recidivism probabilities are modeled once those offenders that never recidivate are 'split' from the rest of the sample. The hazard rate is then specified for the remainder of the sample. Kurlychek et al. (2012) tested both split-population monotonic and non-monotonic polynomials and found that a monotonic exponential polynomial describing a consistently declining hazard rate best fit their sample of adult offenders. The authors concluded that this finding aligned with the traditional criminal career conceptualization of desistance as an event rather than a gradual slowing-down process. However, split population models may lead to increased numbers of 'false desisters' within non-offender groups as a result of the same types of research design issues associated with event-based conceptualizations of desistance (Farrington, 2007; Kazemian, 2007). There is a trade-off in split population models where accurately modeling recidivism probabilities is prioritized and avoiding potential false negatives

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[2] Typically, the split-population model is used imply a very rapidly falling hazard rate which helps to avoid over-prediction of re-offending towards the end of the follow-up period (Schmidt & White, 1989).

sacrificed. As such, this strategy may be more appropriate for predicting recidivism than for describing desistance.

As a more general and more serious limitation of all probabilistic methods is this conceptualization's focus solely on an offender's next offense to define desistance. Recidivism outcomes only consider an individual's 'next offense' and as such accounts for only a snapshot of the offender's broader criminal career (McCuish, Lussier, & Corrado, 2015). As a consequence, an offender's prior and future offending pattern is ignored. For some offenders, recidivism may be part of a broader patter of de-escalation, but survival models are unable to distinguish recidivism as part of a downward trend versus recidivism as part of an increasingly more serious criminal career. Focusing solely on the next offense is particularly problematic within serious and violent offender samples, as re-offending is the norm for this group[3] and therefore is not solely an indicator of persistence. Thus, unless there is death or disease, they are unlikely to cease their involvement in offending altogether with no transition period or 'slowing down' process.

Another consequence of focusing on recidivism concerns the demonstrated differences in recidivism probabilities over age according to the age-crime curve (Piquero, Farrington, & Blumstein, 2003). As depicted in Figure 1.1, the age-crime curve indicates that recidivism between ages 16-20 is more common than recidivism between, for example, 20-24 or 12-16. Therefore, the offender recidivating at age 24 may be characterized by a more concerning criminal career compared to the offender recidivating at age 17. For the former offender, they are recidivating during a period where recidivism is less expected; for the latter offender, they are recidivating at a time when the likelihood of crime is highest. Many recidivism studies statistically control for age-related differences in the probability of re-offending by including the offender's age at the time of assessment or time of recidivism as a control variable. However, the effect of age on re-offending should be controlled for at an earlier stage of the research design. As noted by Shadish, Cook, and Campbell (2002) in their classic discussions of research design and internally validity, statistical controls should be used as a "last resort" (p. 503). Shadish et al. (2002)

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[3] Furthermore, this group's tendency to be involved in more serious offenses, which typically take longer for the courts to process, means that studies with a conviction-based operationalization of recidivism will over-estimate time to recidivism and thus mis-specify the hazard rate distribution.

elaborated that statistical controls, even more sophisticated ones such as propensity score matching, are not widely supported. In effect, statistical analysis cannot be used to fix poor decisions at the stage of research design, making internal validity the '*sine qua non*'. If Shadish et al.'s (2002) perspective is extended to the current issue, it follows that age-related differences in recidivism probabilities are best controlled for at the research design stage. The research design strategy that is appropriate for handling the age-crime relationship involves measuring crime across age, meaning that age comprises one half of the dependent variable as opposed to being used as a statistical control. Le Blanc and Loeber (1998) described this procedure as using the individual's change or stability over time as their own control variable.
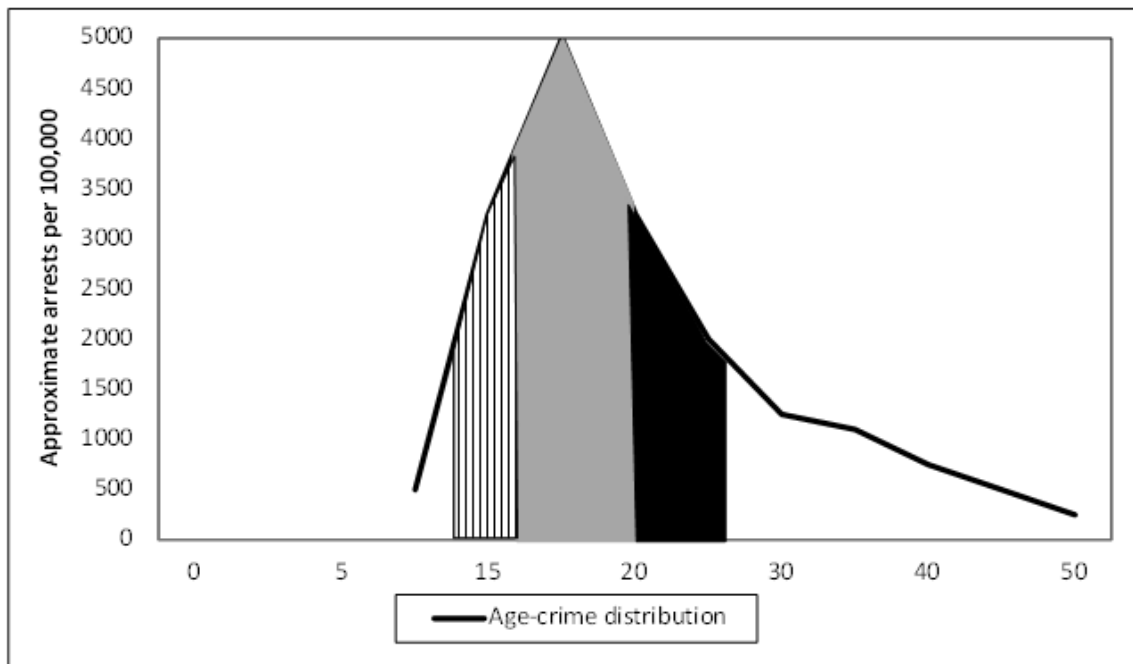
Figure 1.1: Disproportionate likelihoods of recidivism between ages 12-16, 16-20 and 20-24

Controlling for the effect of age on recidivism may be particularly difficult given that this effect is not invariant across offenders (Nagin, Farrington, & Moffitt, 1995). Through the numerous studies examining the unfolding of offending frequency over age (see Jennings & Reingle, 2012; Piquero, 2008), one of the most robust findings has been that the typical age-crime relationship is not characteristic of all offenders (Nagin et al., 1995). Although some offenders follow the age crime curve, others begin to offend at a declining

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rate *after* the end of adolescence for some, others maintain a persistent level of offending through mature adulthood, others are intermittent offenders, and others are adult-onset 'late starters'. Using a probabilistic definition of desistance would thus create difficulties controlling for age given that the effects of age on offending vary across offenders. This again reiterates the need for a research design that considers the dynamic (i.e., within-individual change) and heterogeneous (i.e., between-group differences) nature of the development of offending over time. Although this has been known for quite some time (see Blumstein, Cohen, & Farrington, 1988), forensic psychologists have been slow to move away from single-item indicators of offending outcomes (Corrado et al., 2015; Lussier, McCuish, & Corrado, 2015; McCuish et al., 2015).

1.1.3.   Desistance as a Process

The developmental perspective (Le Blanc & Fréchette, 1989; Le Blanc & Loeber, 1998; Loeber & Le Blanc, 1990) is interested in specifying the dynamic unfolding of offending over the life course. This entails describing the relationship between current and future behavior patterns. From a developmental perspective, desistance is thought to be a process or period of transition between offending patterns[4]. Those studying desistance as a process are interested in the transition between offending and non-offending, rather than the state of non-offending itself (Bushway et al., 2001). Like the probabilistic conceptualization, a process-based conceptualization does not require the complete absence of offending before assuming an offender is desisting (Bushway, Thornberry, & Krohn, 2003). However, unlike the probabilistic conceptualization, desistance as a process is not defined by recidivism. In fact, reoffending is expected to be part of the desistance process for chronic offenders. Laub and Sampson (2003) describe this as a *zigzag* pattern, where the typical persistent offender moves in and out of offending cycles. This zigzag pattern cannot be captured if desistance studies focus only on the next offense. By viewing desistance as a process, the persistent offender that lapses into re-offending as part of a downward trajectory is not conflated with the persistent offender that recidivates as part of an increasingly more frequent offending pattern. The common analogy is one of driving a car at a high rate of speed and must slow down before coming to a full stop

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[4] Life course criminologists also view desistance as a process, but give less weight to prior offending patterns compared to developmentalists (e.g., Laub & Sampson, 2001).

(Lussier, McCuish, & Corrado, 2015). Probabilistic and event-based methods are unable to differentiate offenders that are 'slowing down' from offenders that are maintaining a stable level of offending.

Dynamic classification tables is the analytic strategy commonly associated with measurement of desistance as a process. The first step in this analysis is to construct different categories of offenders, such as chronic offenders, non-chronic recidivists, and non-recidivists (e.g., Lussier, McCuish, & Corrado, 2015, and then examining within-individual change or stability in category assignment across developmental stages (e.g., adolescence and adulthood). Early work emanating from the classic Philadelphia Birth Cohort study was critical for illustrating the importance of chronic offenders. Wolfgang et al. (1972) showed that chronic offenders comprising just 5-6% of the population were responsible for the majority of all crimes committed (Wolfgang et al., 1972). However, this early work (Tracy, Wolfgang, & Figlio, 1990) was also criticized for the arbitrariness of cut scores used to define chronic and non-chronic offenders. In more recent work, Piquero, Farrington, and Blumstein (2007) developed a more objective measure of chronicity by examining recidivism probabilities across each arrest and determining the point (i.e., the arrest number) at which recidivism probabilities become high and stable. This operationalization allowed for flexibility in defining chronicity at different developmental stages. For example, the age-crime curve indicates that offending in adulthood is rarer than offending in adolescence, and so the threshold for being defined as a chronic adult offender may be lower than the threshold for defining the chronic adolescent offender.

In the context of desistance operationalization, offenders characterized by within-individual transitions from a more serious offense category at an earlier developmental stage to a less serious offense category at a later developmental stage are defined as desisters/de-escalators (e.g., Ayers et al., 1999; Cale, Lussier, & Proulx, 2009; Loeber, Stouthamer-Loeber, van Kammen, & Farrington, 1991; Lussier, McCuish, & Corrado, 2015). Thus, when the chronic offender in adolescence transitions to a non-chronic recidivist category in adulthood, they are categorized as a desister. Limitations of dynamic classification tables; however, include the failure to account for time spent incarcerated, arbitrary definitions of developmental stages, and the aggregation of crime patterns at

each developmental stage that may mask more nuanced dynamics of offending patterns. Typically, these limitations are addressed in studies of offending trajectories.

1.1.4.   Desistance as Part of Specific Offending Trajectories

Trajectories refer to the developmental course and dynamic nature of offending over age or time and can be used to explain the evolution of crime across the life course (Nagin, 2005; Nagin & Tremblay, 2005)[5]. The trajectory methodology is consistent with a person-oriented methodological approach, which focuses on within-individual change rather than between-group differences (Magnusson & Bergman, 1988). This person-oriented perspective is embedded within developmental criminology (Lussier & Davies, 2011) to help explain offending onset, persistence, and desistance (Farrington, 2005; Loeber & Le Blanc, 1990; Nagin & Paternoster, 2000). Although there is disagreement concerning whether all (e.g., Laub & Sampson, 2001), or just some (e.g., Moffitt, 1993) trajectories are characterized by desistance, the central premise here is that desistance is part of specific offending trajectories. According to this conceptualization, the desistance process is not necessarily confined to one trajectory, meaning that for some the desistance process will begin in adolescence, adulthood for others. Some patterns may be characterized by a transition from offending to non-offending that culminates with a near-zero rate of offending within a year. In other patterns, the slowing-down process may be more gradual.

Trajectories are more encompassing of an offender's broader criminal career and are typically (see Piquero, 2008) operationalized using lambda (e.g., frequency of total arrests, charges, convictions, or self-reported crimes at each age across the life course [Farrington, 1992]). Nagin and Land (1993) developed semi-parametric group-based modeling (SPGM) to facilitate the statistical approximation of offending trajectories Very much in contrast to analytic strategies for event-based conceptualizations of desistance where clear distinctions can be made between desisters and persisters, trajectories represent approximations of an unknown continuous distribution (Nagin & Land, 1993; Nagin & Tremblay, 2005). Although individuals can be assigned to a trajectory based on

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[5] It is important to avoid equating offending *frequency* and offending *trajectories* as only the latter captures the dynamic and qualitative nature of offending patterns (Nagin & Tremblay, 2005).

the maximum probability assignment rule, the individual does not necessarily follow this trajectory in lock-step. The trajectory is essentially average lambda for all offenders assigned to that trajectory. From a policy perspective, perhaps the greatest concern is that trajectories identified by SPGM will be reified (Nagin, 2005; Skardhamar, 2010). As an example, although an analysis identifying four trajectories does not imply that four distinct types of offenders exist in the population, policy-makers may conclude that these groups are real and that all offenders fit into one of the four trajectories identified. This latter issue is not per se a limitation of the analytic strategy, but rather a failure to communicate or interpret the findings resulting from the analysis.

Whereas dynamic classification tables compare an aggregate general trend over two time points, trajectories capture onset, escalation, diversification, persistence, de-escalation, specialization, and desistance (e.g., Lussier et al., forthcoming). In effect, the trajectory conceptualization is consistent with the notion of desistance as a process, but unlike dynamic classification tables, a more nuanced measurement of the timing and nature of the desistance process is performed, which allows for different trajectories of desistance to appear. Although right-censoring is also a problem in trajectory research, the impact of a re-offense occurring after the follow-up period will not have as substantial an effect on the prevalence of 'false desistance' relative to event and probabilistic-based analytic strategies, which rely entirely on the presence/absence of recidivism to determine desistance.

1.1.5.   Specification of a Working Definition of Desistance for the Current Dissertation

Table 1.1 summarizes the abovementioned different definitions of desistance and their associated analytic strategies, strengths, and weaknesses. Some analytic strategies may be more prone to the identification of false desisters (i.e., individuals labeled as desisters but who actually remain involved in offending) and false persisters (i.e., individuals in the process of desistance but are labeled as persisters). Analytic strategies for event and probability-based conceptualizations are especially plagued by false desistance and persistence. Failure to account for exposure time, a particular concern for event and process-based conceptualizations of desistance, also increases the prevalence of false desistance. Using data from the California Youth Authority study, Piquero et al.

(2001) illustrated that the prevalence of desistance, defined as an event, was 20% lower when exposure time was accounted for. The risk of misclassification due to methodological limitations may also lead to incorrect conclusions regarding the efficacy of particular theories and misguide practitioners seeking to identify the risk factors most likely to act as barriers to their client's desistance. Although there are several theories that specify different mechanisms responsible for desistance, if the limitations of analytic strategies are not addressed or at least acknowledged, it could lead to uninformed acceptance or rejection of particular theories or risk factors important for understanding persistence or desistance. Given the information in Table 1.1, it appeared that measures using offending trajectories would provide the most accurate description of desistance (see also Bushway, Paternoster, & Brame, 2003). Thus this dissertation examined offending trajectories, and specific attention was given to the manner in which exposure time may affect the validity of the trajectories identified.

For the different examinations of desistance in the current dissertation, desistance will be viewed as a process, not an event. This process is characterized by a slowing down of offending as opposed to evidence that the offender has terminated from offending by remaining crime-free for a specified period of time. According the definition of desistance used in the current dissertation, recidivism will be part of the desistance process. Non-offending will also not necessarily be evidence of desistance. Measures of incarceration time will be used to identify offenders appearing to desist but whom in reality simply had limited offending opportunities due to the lack of exposure to the community. This latter component of the desistance definition is necessary to address the known intermittency associated with criminal careers (Kazemian, 2007).

Table 1.1: Description of four different conceptualizations of desistance

	Conceptualization			
	Desistance as an event	**Desistance in probabilistic terms**	**Desistance as a process**	**Desistance as a specific trajectory**
Description	Termination from offending (i.e., non-involvement) for a specified period of time	Probability of non-offending over some time period	The transition between offending and non-offending where an individual's rate of offending declines	Specific offending trajectories associated with near-zero offending rates over time
Operationalization	Specified number of years without committing a new offense	Different measures of recidivism (e.g., re-arrest, re-entry into custody)	Measure decline in the frequency of offending over time	Measure frequency of offending over age (see Bushway et al., 2001)
Analytic strategy	Examine the distribution of offenders with and without an offense during the study	Monotonic/non-monotonic distribution survival analysis Split-population models	Dynamic classification tables	Semi-parametric group-based modeling
Strengths	Easy to measure	Can adjust for time at risk Does not assume that non-offending equals desistance	Well-suited for high rate offenders Captures multiple developmental periods	Captures the full criminal career
Limitations	Subjective selection of at-risk period High risk of false negatives (i.e., false desisters)	Right censoring Failure to consider an offender's broader criminal career	Subjective specification of developmental periods Does not control for exposure time	High risk of false negatives due to poor method of incorporating exposure time

1.2. Contribution of the Dissertation to Theory, Research, and Policy

This dissertation will add to the literature on desistance by: (1) providing information on the types of offenders that are of greatest importance to desistance research (i.e., those at the deep end of the criminal justice system; Laub & Sampson, 2001; Mulvey, et al., 2004), (2) using theoretically-informed variables to describe the characteristics of individuals more or less likely to desist, and (3) addressing the limitations of recidivism-focused desistance research by using more sophisticated analytic strategies to capture broader criminal career patterns. These three additions to the literature will be accomplished by using a sample of incarcerated serious and violent adolescent offenders. This sample was followed from age 12 to 28 (i.e., beyond the period of emerging adulthood) and at each year of age information pertaining to their criminal history was coded. This data will be used in three different studies to examine (1) persistence and desistance trajectories associated with general offending, (2) persistence and desistance trajectories associated with involvement in serious crimes, and (3) persistence and desistance trajectories associated with involvement in violence. By examining these trajectories defined by different types of offending outcomes, the current dissertation addresses the need for attention to 'special' categories of offenders that are noted to provide criminal justice practitioners with particular challenges (Rosenfeld, White, & Esbensen, 2012). To better understand these different offending trajectories, a broad range of risk and protective factors will be incorporated into a series of multinomial logistic regression analyses, with specific attention given to the role of psychopathic personality disturbance (PPD). Throughout, the terms 'PPD' or 'symptoms of psychopathy' are used in place of 'psychopathy' because technically adolescents cannot be diagnosed with psychopathy.

Although the three studies will primarily operate under the assumption that symptoms of psychopathy increase the likelihood of a more chronic, more serious, or more violent criminal career, the results will be reflected upon from a desistance perspective as opposed to the more typical approach of specifying why PPD is related to offending. The purpose of this approach is to introduce to criminologists the manner in which psychopathy

may affect the ability of different desistance theories to account for who will or will not desist as well as who will or will not benefit from the types of intervention strategies implicated by desistance theories. In doing so, the study has important implications for current criminal justice system policies. As will be outlined in greater detail in Chapter Three, because psychopathy has not been integrated into the desistance literature, subsequent policies stemming from this literature may be lacking offender specificity. That is, treatment or intervention policies that work for the 'average' offender may not be appropriate for the individual scoring high on symptoms of psychopathy.

This dissertation (see Chapter Three) will build upon the idea that PPD will render ineffectual many treatment/intervention strategies that evolved from desistance theory. For example, emphasis within desistance policy has included promoting identity change or cognitive transformations where the individual changes their attitude towards antisocial behavior (Maruna, 2001), using specific deterrence to change offenders' assessments of costs versus benefits (Cusson & Pinsonneault, 1986), and establishing ties to family and employment as a means of creating informal social controls that an offender does not wish to risk losing by re-offending. When considering the nature of the psychopathy construct, the stability of this personality disorder over the life course (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007) implies that cognitive transformation will not occur. Further, individuals with high symptoms of psychopathy tend to not be deterred by the potential consequences of actions (Caldwell, Skeem, Salekin, & van Rybroek, 2006; Vaughn, Howard, & DeLisi, 2008). Finally, prototypical symptoms of psychopathy include a lack of long term goals, a lack of perseverance, and a lack of commitment towards even those closest to the individual (Kreis, Cooke, Michie, Hoff, & Logan, 2012. In effect, the nature of the psychopathy construct would appear to act as a barrier to a variety of desistance policies. Although those characterized by psychopathy represent a minority of all offenders, they are also hypothesized to be disproportionately involved in offending and therefore constitute an important group for (Corrado et al., 2015).

1.3. Outline of Chapters

Before discussing the desistance literature and the specific literature guiding each of the three studies in the current dissertation, attention is first turned to addressing the

validity of a potential criticism of the current research design. Namely, prior research on serious adolescent offenders supports the assertion that risk factors in childhood and even adolescence are uninformative of adult offending outcomes (Sampson & Laub, 2003). Sampson and Laub (2003) used data from the Gluecks' Unraveling Juvenile Delinquency Study to illustrate that developmental criminologists were inaccurate in their claims that adolescent risk factors were informative of persistent offending adulthood. The implications from Sampson and Laub's research could be used to object to the current dissertation's research design and associated analytic strategy. Specifically, each of the three studies in the dissertation center on adolescent measures of PPD and other risk and protective factors that are used to help explain offending outcomes in adulthood. This line of analysis is thus in contrast with Sampson and Laub's notion that adolescent measures do not contribute to explanations of chronic offending through adulthood. In Chapter Two the validity of Sampson and Laub's (2003) assertions are examined. Particular focus is given to how the research design in the Unraveling Juvenile Delinquency study may have affected the validity of their conclusions.

Chapter Three is used to contextualize the broader rationale for the examination of psychopathy as a barrier to desistance. The psychopathy construct is described and criminologists' previous uses of the construct are critiqued. An argument is put forward that the best utilization of the psychopathy construct is when researchers attempt to explain more narrow categories of offending. Chapter Three discusses how psychopathy can be used to help explain involvement in chronic, serious, and violent offending trajectories and therefore helps address Rosenfeld et al.'s (2012) call for greater attention to special categories of offenders. Also as part of Chapter Three, desistance theories emerging largely from within existing criminological paradigms/theoretical frameworks are discussed. Although these theories are not specifically tested in any of the three studies, attention is given to the manner in which symptoms of psychopathy, at least conceptually, will prevent or interrupt causal mechanisms associated with desistance as specified by these different theories.

Chapter Four outlines the specific aims of each of the three studies, and then the three studies are presented in Chapters Five, Six, and Seven. The three studies test the hypothesis that symptoms of psychopathy measured in adolescence will be associated

with involvement in chronic offending, serious offending, and violent offending through mature adulthood. In Chapter Eight, although the analytic strategies used in each of these chapters are very much in line with how previous research has approach the topic of chronic/persistent offending and the risk factors associated with these trajectories, the results of each chapter are reflected upon with the desistance literature in mind. A particular emphasis of Chapter Eight is the implications of the three studies for desistance theory and policies derived from desistance research.

Chapter 2.

The Search for Factors Contributing to Adult Offending Outcomes

According to Moffitt (1993) neuropsychological deficits combined with early life adversity such as a negative family environment influence involvement in continued offending in adulthood, and for two reasons. First, such experiences situate an offender within a lifestyle associated with criminogenic behavior. Second, such neuropsychological deficits prevent the occurrence of, or the ability to benefit from, turning points associated with desistance (Moffitt, 1993). From this perspective, early life experiences set the stage for an individual's openness to change and help shape the individual's environment in a manner that creates conditions conducive to change. Drawing from the human agency literature (e.g., Maruna, 2001), Laub and Sampson (2001, 2003) asserted that developmental theories neglected an offender's will to change and did not attribute adequate weight to the randomness of events across the life course (see Walters, 2002). Sampson and Laub (2003) also critiqued the notion of life course persistent offending. Using data from the Unraveling Juvenile Delinquency study these authors showed that, contrary to assertions from developmental criminologists (e.g., Moffitt, 1993), the highest rate offenders in adolescence were not the highest rate offenders over different stages of adulthood.

From the position of life course theorists (see Laub & Sampson, 1993; Laub & Sampson, 2003), developmental perspectives are too deterministic[6]. According to life course theorists, the transition from adolescence to adulthood inevitably provides access to new roles, regardless of the individual's prior negative circumstances. These new roles promote desistance by discouraging involvement in offending and all prior negative circumstances simply act as 'noise' (Sampson & Laub, 2003). Through their analysis of

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[6] Others (e.g., Bushway, 2013) noted that Laub and Sampson's (2001) perspective may be invoking a straw-man argument as Moffitt (1993, 1994) and other developmentalists (e.g., Le Blanc & Frechette, 1989) have acknowledged the importance of life events and argued that life course persistent delinquents are simply less likely to experience turning points, not that this type of offender cannot experience turning points.

data from the Gluecks' Unraveling Juvenile Delinquency (UJD) Study, Sampson and Laub (2003, 2005a) concluded that there was very little evidence that risk factors measured in adolescence and offending patterns measured in adolescence could be used to help make sense of adult offending outcomes. The studies in the current dissertation only extend into mature adulthood, whereas Sampson and Laub's (2003) study extended into late adulthood. Reviewing their work here is not done for the purposes of comparing results across studies. Rather, given that the aims of the studies conducted in the current dissertation directly contradict Sampson and Laub's (2005) perspective (i.e., the utility of adolescent risk factors to help explain adult offending outcomes), it seemed appropriate to further explicate their prior work on the UJD Study to evaluate the validity of their assertions. Indeed, if the conclusions Sampson and Laub (2003) have made about the developmental criminology perspective are accurate, then there may be a lack of efficacy associated with the types of questions that are being addressed in this dissertation.

2.1. Explicating Sampson and Laub's Perspective

In a series of articles and books, the research partnership between Sampson and Laub provided enormous contributions to what is currently known about offending over the life course. Although it will be argued that several of their assertions about developmental criminology were incorrect, at the very least, their monumental work has forced developmental criminologists and others seeking to explain offending over the life course to more clearly clarify their positions about the nature of offending, including what it means to be a persistent offender and which specific factors increase the risk of being associated with this type of trajectory. Part of this explication involves describing Sampson and Laub's failure to examine whether psychopathy was associated with continued offending. Of course, standardized measures of psychopathy were not available at the time the Gluecks collected data and as such Sampson and Laub's failure to examine psychopathy should not be considered a lack of diligence. Unlike typical longitudinal studies in criminology where individuals are recruited from the general population or from at-risk neighbourhoods, such as the Cambridge Study in Delinquent Development, the Denver Youth Study, the Dunedin Multidisciplinary Health and Development Study, the Philadelphia Birth Cohort Study, the Pittsburgh Youth Study, and the Rochester Youth

Development Study, Sampson and Laub utilized longitudinal data from an offender sample.

Approximately 50 years after the Gluecks' initial data collection on adolescents sampled from various institutions throughout the Boston, Massachusetts area, Laub and Sampson (1988) completed their first re-analysis of the Gluecks' data. From Laub and Sampson's (1988) perspective, the Gluecks' interest in identifying individual-level risk for involvement in crime lead to them being vilified by the sociological community (see Laub & Sampson, 1991; Laub, 2006). Laub and Sampson (1988) thus asserted the importance of addressing empirical questions independent of ideological perspective. Very interestingly, early on in their analysis of the UJD Study data, Sampson and Laub (1990) discussed findings that were very much in line with the developmental perspective that they would later critique. Some of these findings are reviewed, and then the change in Sampson and Laub's perspective is described.

Initial analyses of the UJD data indicated that child temperament was informative of continued involvement in offending during adulthood (Sampson & Laub, 1990), as was having a history of childhood temper tantrums (Laub & Sampson, 1993). Continuing with this perspective, Sampson and Laub (1992) asserted that the life course perspective as it relates to offending is characterized by a "strong connection between childhood events and experiences in adulthood" (66). Acknowledging that the developmental perspective was not deterministic because it allowed for the specification of within-individual change, Sampson and Laub (1992) commented that early childhood risk factors and associated involvement in antisocial behavior remained relatively stable over time. Sampson and Laub (1992) asserted that part of the reason for this stability was related to failing to experience positive turning points due to the selection effects associated with the accumulation of early risk factors. For example, Sampson and Laub (1996) found that individuals with low IQ and prior delinquent behavior did not typically experience the beneficial effects of important protective factors like military service. They also concluded that "the continuing search for childhood protective factors and individual differences in resilience is surely important for our understanding successful adult outcomes" (Sampson & Laub, 1996: 347). Laub, Nagin, and Sampson (1998) also noted that marriage alone did not have a lasting effect on abstention from crime, likely because juvenile delinquency

was associated with marriage quality. These selection effects prompted Sampson and Laub (1994) to describe many of the boys in the Glueck sample as career criminals. In sum, this early perspective was very much in line with developmental approaches to the understanding of crime across the life course (e.g., Le Blanc & Frechette, 1989 Moffitt, 1993).

However, this early perspective clearly changed after these authors compiled a series of articles and a book (see Laub and Sampson, 2003) where the follow-up period for the Glueck sample was extended to age 70. In Sampson and Laub's (2003) re-analysis of this follow-up data, the authors used semi-parametric group-based modeling (SPGM), a technique not available in statistical software packages at the time of their earlier analyses, to examine the number and shape of offending trajectories underlying the data. From this analysis, three main conclusions were drawn: (1) Moffitt's (1993) notion of life course persistent offenders was not an empirical reality, (2) measures of risk factors in childhood and adolescence were not informative of the most serious adult offenders, and (3) in contrast to the developmental criminology perspective of asymmetrical causation, explanations of desistance were simply the inverse of explanations of persistence (also see Sampson & Laub, 2005a). To expand on some of these points further, Sampson and Laub's (2003) examination of offending trajectories indicated that essentially all offenders, regardless of trajectory group, showed a pattern of desistance by age 70. The most concerning of these trajectories comprised only 3.2% of the sample. This low proportion of the sample involved in a high rate chronic trajectory was not simply a result of extending the analysis beyond middle adulthood. In their analysis of offending trajectories to age 32, only 11 offenders (2.29% of the sample) were associated with this type of trajectory. An important question therefore becomes, if offenders that persist from adolescence through adulthood cannot be identified within a purposive sample of offenders, does this type of offender even exist?

Sampson and Laub (2005b) also asserted that there were no childhood/adolescent risk factors to account for involvement in a high rate offending trajectory. Instead, they asserted that the essentially unpredictable acquisition of informal social controls explained offending desistance amongst all offenders. Remaining on this line of thought, Sampson and Laub (2005c) asserted that persistence and desistance were "two sides of the same coin" (172), meaning that the lack of informal social control explained involvement in

offending, whereas the acquisition of informal social controls such as marriage, parenthood, military service, and employment explained why even previously high-rate offenders eventually desisted (see also Sampson & Laub, 2005a). As a result of their various analyses, Sampson and Laub (2005b) concluded that "we have failed to find convincing evidence that a life course persistent group can be prospectively or even retrospectively identified based on theoretical risk factors at the individual level in childhood and adolescence" (75). The intention of this review is not to criticize researchers for changing their opinion in light of new evidence. The question here is whether the change in perspective was based on inaccurate analyses and inaccurate interpretations of the data. What requires further investigation is whether Sampson and Laub's (2003, 2005a, 2005c) findings were related to research design issues.

2.1.1. Potential Research Design Issues with the Unraveling Juvenile Delinquency Study

A review of the nature of the UJD Study indicates several problems with the research design of this study that may have influenced Sampson and Laub's (2005a, 2005b) critique of developmental criminology. Some of these research design issues include whether the sample was in fact a serious group of adolescent offenders or simply a group involved in mostly nuisance-based offenses and behaviors considered to be crimes in adolescence but not in adulthood. Relatedly, the UJD sample appeared to offend at a rate more similar to that of community-based samples than offender-based samples, challenging Laub and Sampson's (2003) assertion that the data were particularly conducive to identifying life course persistent offenders. As well, the failure to account for exposure time (a) from mature adulthood through to age 70 in some analyses and (b) entirely in trajectory analyses to age 70, may have influenced the classification of the most concerning types of offenders into a trajectory characterized by desistance. Finally, the types of risk factors used by Sampson and Laub (2003) to differentiate between their high-rate chronic trajectory and other trajectories lacked the specificity needed to differentiate chronic offenders from non-chronic offenders.

Measurement of Offending in the UJD Study

Sampson and Laub (2003) included status offenses when examining whether 'high rate' adolescent offenders continued to be 'high rate' adult offenders. As indicated by their analyses of different crime categories, 'other' offenses, which included status offenses and nuisance behaviors[7] such as disorderly conduct, vagrancy, gambling, speeding, conspiracy, lewdness, impersonation of a police officer, resisting arrest, desertion, failure to pay child support, and hunting near a dwelling, were the most common crime-type during adolescence (see Figure 7 from Sampson and Laub [2003]). In effect, if the behaviors that contributed to being a high rate offender in adolescence were repeated in adulthood, none of these behaviors would count towards this individual's frequency of offending in adulthood. The commonality of status offenses within this sample also suggests that the sample is not as serious as initially described. As further evidence of this, Sampson and Laub (2003) found that accounting for exposure time in their trajectory analysis did not markedly alter the shape of their offending trajectories. As Piquero et al. (2001) illustrated in the California Youth Authority Study, controlling for incarceration time has substantive implications for the interpretation of offending patterns within offender samples.

In addition to the prevalence and frequency of status offenses, another concern is that relatively minor, ubiquitous types of public order offenses were the most prevalent crime-type within the crime-mix of offenders from the UJD sample (Laub & Sampson, n.d.). Sampson and Laub (2003) reported that alcohol and drug-related offenses were committed at a rate two times higher than the sample's involvement in violence-related offenses. From age 28 onward, alcohol and drug-related offenses were the most common crime-type. In the same study, approximately half of all offenses committed, regardless of developmental stage examined, fell into either the alcohol/drug offense type or the 'other' offense type. In sum, a review of the offenses that the UJD sample committed reveals that (a) frequent involvement in status offenses may help account for why the most frequent offenders in adolescence were not the most frequent offenders in adulthood, (b) many of the offenses were trivial 'nuisance' type behaviors that may not be influenced by typical

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[7] It should be noted that certain of these behaviors would no longer be considered criminal offenses (e.g., gambling).

criminogenic risk factors, and (c) some offenses during the early stages of data collection were no longer legally defined as criminal behaviors during later stages of data collection, regardless of the age at which they were committed. Taken together, continuity of behavior over time did not necessarily mean continuity of offending over time.

The Identification of 'Chronic' Offenders

Even though the group that Sampson and Laub (2003) termed chronic offenders were defined by involvement in relatively ubiquitous crimes (see discussion above), the appropriateness of this group's 'chronic' label is also contentious. When compared to other chronic offender trajectories found in incarceration and community-based samples, the prevalence and course of Sampson and Laub's (2003) high-rate chronic group appears more similar to the latter than the former. For example, regardless of whether the trajectory analysis to age 32 or to age 70 is examined, the high-rate chronic trajectory identified for members of the UJD study never averaged more than three arrests per year. In comparison, the highest rate trajectory resulting from McCuish et al.'s (2015) SPGM analysis of Canadian male and female incarcerated young offenders peaking at nearly six convictions per year. Similarly, a trajectory analysis of the Harreveld youth detention sample from the Netherlands found a chronic offender trajectory that peaked at five offenses in the mid-20s and maintained an average of more than three offenses until age 30 (van der Geest, Blokland, & Bijleveld, 2009). Again in the Netherlands, the Criminal Career and Life Course Study measured convictions for over 5,000 offenders that were sampled with the intention of resembling the country's general population of adjudicated offenders. In effect, these were not necessarily the country's most serious and violent offenders. Still, through their SPGM analysis, Blokland and Nieuwbeerta (2005) found high-rate chronic group which averaged over 2.5 convictions between ages 20 and 72, which was substantively higher than the frequency of arrest among Sampson and Laub's (2003) high-rate chronic trajectory. Looking at the California Youth Authority sample, Piquero et al. (2001) found that offenders in their highest-rate trajectory averaged approximately 6.5 arrests per year between ages 18-33. Overall, Sampson and Laub's (2003) sample of apparently serious offenders were involved in substantially fewer offenses compared to other studies using offender samples.

Comparing the frequency of offending by members of the UJD sample to community-based samples indicates more similarities than differences. For example, trajectory studies from the Cambridge Study in Delinquent Development (CSDD; e.g., Piquero et al., 2012) identified very similar levels of offending among their chronic offenders compared to chronic offenders from the UJD data. The similarities in frequency and prevalence of the chronic offender groups were found even despite the Glueck data measuring offending via charges and the Cambridge study via convictions (the latter more poorly capturing the dark figure of crime). In analyses of the Christchurch Health and Development Study (CHDS), chronic offenders averaged more than 3.5 *different types* of offenses at age 18 (Fergusson, Horwood, & Nagin, 2000). Importantly, the prevalence of the chronic offending trajectories in the CSDD and the CHDS were both similar to the prevalence of the high-rate chronic group in Sampson and Laub (2003) study[8].

Very importantly, Sampson and Laub's (2003) high-rate chronic offending trajectory comprised just 2.29% of their sample in their analysis to age 32 and 3.2% of their sample in their analysis to age 70. As noted by Blokland et al. (2005), Laub and Sampson's (2003) examination of offenders in high-rate versus other trajectories sometimes involved comparisons of as few as five individuals. The statistical analyses needed to examine the relationship between childhood risk factors and association with a chronic offending trajectory were very likely adversely affected by this low base rate (MacLennan, 1988). Moreover, according to Bushway (2013) the analytic strategy Sampson and Laub (2003) relied upon lacked the sensitivity necessary to classify outliers (e.g., the most chronic offenders) into their own category. Instead, the individual is assigned to the next highest trajectory by default. In the context of Sampson and Laub's (2003) analysis, even though their high-rate chronic trajectory comprised a very small proportion of their sample, it is likely that particularly chronic offenders existed in this trajectory whose membership in said trajectory occurred simply because of a statistical compromise. In Proc TRAJ, for example, Bayesian Information Criteria (BIC) values are used to interpret the trade-off between fit and parsimony. With such a small group of chronic offenders, it is likely that parsimony was preferred over fit (see Bushway, 2013 for

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[8] This was necessary to describe in order to illustrate that it was not simply a matter of the two studies identifying the same type of chronic offender that was simply less prevalent within the community study.

further discussion), meaning that the height and shape of Sampson and Laub's (2003) high-rate chronic trajectory is not a true representation of the chronic offender. Further contributing to this potential mischaracterization is Sampson and Laub's (2003) failure to account for exposure time in their analyses.

Accounting for Incarceration Time

Incarceration is particularly likely to constrain the behavior of the most serious types of offenders, making it difficult to identify in trajectory analyses true life course persisters (Bushway, 2013). The offenders most likely to continue to offend are the offenders that are most likely to face increasingly more severe incarceration sentences. At some point, this type of offender will receive a particularly punitive sanction that will limit their ability to participate in crime for a substantial period of time. Sampson and Laub (2003, 2005a) did not have records of incarceration after age 32 for members of the UJD sample (see Robins, 2005). Moreover, their trajectory analyses to age 70 (Sampson & Laub, 2003) did not appear to account for incarceration time at all. When incarceration time was accounted for in trajectory analyses through age 32, the majority of offenders initially classified their high-rate chronic offending trajectory were no longer in this trajectory once incarceration parameters were included in their model. Similar to speculations made by Blokland et al. (2005), it is possible that the highest rate offenders in the UJD study were offenders involved in relatively minor crimes that escaped serious response from the criminal justice system. The failure to account for incarceration time is particularly concerning when examining the manner in which Massachusetts sentencing laws respond to certain offenders. For offenders in the UJD study, if they were involved in moderately serious offenses such as unarmed robbery, sentencing provisions in Massachusetts call for a custody sentence between five and 7.5 years (Massachusetts Court System, 2016). Looking back at the UJD sample, although likely subject to slightly different sentencing practices given the different time period, it is likely that the members of this sample involved in the most serious crimes spent a substantial period of time incarcerated. Since Sampson and Laub (2003) did not measure exposure time after age 30, assignment to a desistance trajectory was likely for such offenders.

Inappropriate Specification of Key Risk Factors

Most relevant to their critique of developmental criminology, even if Sampson and Laub (2003) obtained an adequate base rate of high-rate chronic offenders, they still likely would have failed to find differences between this group and offenders in other offending trajectories. This result would not be because of developmental criminology's mistaken emphasis on adolescent risk factors, but because of Sampson and Laub's (2003) misspecification of which risk factors should distinguish between chronic and lower-rate offenders. Sampson and Laub's (2003, 2005a) index of child risk included items such as low IQ[9], adventurousness, extroversion, difficult child behavior (individual risk index), poverty, low maternal supervision, and large family (family/environmental risk index). According to Robins (2005) these types of risk factors are theoretically unrelated to chronic offending and are far too broad (i.e., characteristic of *most* offenders) to be able to explain differences *among* offenders. Rather, these factors are more in line with components of low self-control used to differentiate offenders from non-offenders (Gottfredson & Hirschi, 1990). Inclusion of more important risk factors with less important risk factors in the same scale is also problematic because both types of items are given equal weight (Robins, 2005). As well, quite confusingly, Sampson and Laub (2003, 2005a) appeared to exclude measures of childhood temperament from their risk index. These measures were found in their earlier work to be informative of offending outcomes in adulthood, even from ages 32-45 (e.g., Sampson & Laub, 1994).

Overall, Sampson and Laub's (2003) measure of childhood risk did not represent the interaction between neuropsychological perturbations and negative family background despite Moffitt (1993) articulating this risk factor combination to be the source risk factor combination for life course persistent offenders. It therefore appears that Laub and Sampson (2001) are making conclusions about the developmental perspective based on inadequate testing of this perspective (e.g., straw-man logic). As outlined by Chung, Hill, Hawkins, Gilchrist, and Nagin (2002), explanations of offending persistence from adolescence through mature adulthood require the specification of proximal risk factors.

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[9] Use of low IQ was particularly inappropriate given that Glueck and Glueck (1950) mentioned that there were large discrepancies between their IQ test scores and the IQ scores found within the files of members of their sample.

Proximal risk factors are those that remain relatively stable over the life course and thus follow an individual's offending trajectory in lock-step. Factors such as residential instability, abuse, and poor parental attachment are described as distal factors, or factors that do not exert a consistent effect on offending over the life course (Chung et al., 2002; Losel & Bender, 2003). Such factors were common in Sampson and Laub's (2003) risk index. To explain long-term patterns of offending, proximal risk factors addressing psychopathology are needed. If there are certain factors in adolescence that are informative of adult offending outcomes, identifying such factors is critical, as it is rather unhelpful to wait until later stages of adulthood to begin intervention (Bushway, 2013). Part of Laub and Sampson's conclusion in their 2003 book was that their critics must provide a stand-alone risk factor typically independent or uncorrelated with other risk factors that can help explain the development and continuation of crime across the life course. Robins' (2005) concern was that existing risk factors in criminology were not suitable for distinguishing among offenders. In this dissertation, psychopathy is introduced as a risk factor neglected by Laub and Sampson (2003) that can offer a valid critique of their perspective. In Chapter Three, the role of psychopathy is introduced as an ideal construct for explaining this type of offending.

Chapter 3.

Psychopathy as a Barrier to Desistance: Understanding and Integrating the Construct

Raising concerns about the failure to account for symptoms of psychopathy within existing desistance theories is a principal aim of this dissertation. Here, the psychopathy construct is described, its uses and misuses explained, and its contribution to explanations of chronic, serious, and violent offending specified. The construct is described in greater detail and issues with its measurement and use are explained to help provide directions for future incorporation of this construct within developmental and life course research. Following this, existing theoretical perspectives on desistance are reviewed. For each theory reviewed, consideration is given to the manner in which symptoms of psychopathy will act to either prevent or disrupt the causal mechanisms specified to initiate and maintain the desistance process. Very importantly, the current dissertation is not a specific test of these theoretical perspectives and does not attempt to empirically demonstrate how symptoms of psychopathy might negate the effects of factors thought to promote desistance. Instead, the specific analyses in the current study only examine whether psychopathy is a barrier to desistance.

3.1. The Psychopathy Construct and the Gold Standard Measure

Greenberg and Mitchell (1983) described broader notions of an individual's personality as a set of latent traits that influence how this individual views themselves, how they interact with others, and how they interpret and respond to their environment. Certain clusters of latent traits are thought to create patterns of dysfunctional behaviors; these clusters are used to describe different personality disorders. Although not explicitly in the Diagnostic and Statistical Manual of Mental Disorders (DSM), psychopathy is considered a personality disorder (Hare, Hart, & Harpur, 1991). Generally, this disorder is believed to be defined by personality traits that promote dysfunction in emotional, interpersonal, and behavior domains of functioning (Cleckley, 1976; Cooke et al., 2012;

Dawson et al., 2012). Within these three domains, Cleckley (1976) listed 16 personality traits that he felt were critical to the psychopathy construct. However, these traits were simply described by Cleckley (1976) without giving consideration to specific measurement procedures.

To more systematically assess for symptoms of psychopathy, Hare (1980) developed the Psychopathy Checklist (PCL), which eventually was replaced by the Psychopathy Checklist – Revised (PCL-R). In addition to the influence of Cleckley, this instrument was constructed based on Hare's (2003) experiences with incarcerated male adult offenders. The PCL-R provides an assessment and rating of psychopathic personality based on a maximum score of 40, with a score of 30 or higher typically representing the criteria for the diagnosis of psychopathy in adulthood (Hare, 2003). However, operationalizing psychopathy in this manner (i.e., as a categorical construct) may arise in several limitations. First, cut score criteria are largely arbitrary and vary across jurisdictions (e.g., North America versus Europe). Second, this categorical approach risks including individuals who are not 'psychopathic' or excluding individuals who are 'psychopathic', which increases the risks of false positives and false negative in the prediction of offending (Iselin, Gallucci, & DeCoster, 2013). Third, the DSM-V as well as more recent studies using advanced analytic techniques (e.g., Edens, Marcus, Lilienfeld, & Poythress, 2006; Haslam, Holland, & Kuppens, 2012; Murrie et al., 2007; Strickland, Drislane, Lucy, Krueger, & Patrick, 2013; Walters, Duncan, & Mitchell-Perez, 2007) support the assertion that psychopathy is a dimensional construct rather than a categorical one.

In terms of underlying personality and behavioural dimensions, confirmatory factor analyses of the PCL-R have supported the retention of a two factor model comprised of interpersonal and affective deficits (Factor 1) and social deviance items (Factor 2; Hare, 1991), a two-factor four facet model divided into interpersonal, affective, lifestyle, and antisocial domains (Hare & Neumann, 2006), and a three facet model which simply excludes the antisocial facet described by Hare and Neumann (2006). The debate regarding these models has focused on whether antisocial indicators should be included in the measurement of psychopathy. Such inclusion was controversial because (a) it was felt that reliance on these items moved the measurement of psychopathy away from

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personality theory and (b) inclusion of these antisocial indicators created tautological issues (Skeem & Cooke, 2010; cf., Hare & Neumann, 2010).

According to Dawson et al.'s (2012) analysis, of the twenty items included in the PCL-R, five were directly measured based on the individual's involvement in prior criminal or antisocial behavior. These items included: (1) serious criminal behaviour, (2) serious violations of conditional release, (3) criminal versatility, (4) early behavior problems, and (5) poor anger control. Cooke and Skeem (2010) argued that these antisocial behaviors were *consequences* of these traits, rather than primary *symptoms* of the disorder itself. Cooke et al. (2004) maintained that the PCL-R's emphasis on antisocial items shifted focus away from psychopathy as personality disorder. Additionally, tautological concerns have been raised on the basis of the PCL-R's measurement of prior criminal behavior to predict future criminal behavior (Dawson et al., 2012). This has been referred to as an issue of criterion contamination, where there is overlap between the predictor and outcome variables (Forth & Book, 2010).

In addition to PCL-R items directly measured by prior criminal or antisocial behavior, there are also five items on the PCL-R that are defined by impulsive or irresponsible behaviour, including: (1) stimulation-seeking, (2) impulsivity, (3) parasitic orientation, (4) irresponsibility, and (5) lack of long-term goals. From Farrington's (2005) perspective, this is problematic because involvement in antisocial and criminal behavior are characteristics of the items described above. As a consequence, inclusion of antisocial behavior items was essentially a second counting of the items tapping into impulsive and irresponsible behavior, making the PCL-R even more biased towards measurement of psychopathy via behavioral items rather than s rather than personality indicators. Indeed, just 10 of the 20 items measured using the PCL-R capture the classic personality traits of psychopathy, such as a lack of remorse, shallow affect, and callousness (Cleckley, 1976; Kreis et al., 2012). Cooke and Michie (2001) demonstrated that the solution to this issue was to exclude the antisocial facet from the measurement of psychopathy. However, not surprisingly, Hare (2003; also see Hare & Neumann, 2005, 2006) as well as others (e.g., Forth, Kosson, & Hare, 2003; Salekin, Brannen, Zalot, Leistico, & Neumann, 2006) maintained that the inclusion of antisocial items was helpful for criminal justice purposes in terms of the prediction of offending outcomes.

3.1.1. State of the Extant Research on Psychopathy and Offending

Despite the negative perspective of the antisocial facet (Skeem & Cooke,2010), this facet has been consistently informative of recidivism (Corrado, Vincent, Hart, & Cohen, 2004; Gretton, Hare, & Catchpole, 2004; Piquero et al., 2012; Vitacco, Neumann, Caldwell, Leistico, & Van Rybroek, 2006; Vincent, Odgers, McCormick, & Corrado, 2008; Vitacco, Neumann, & Jackson, 2005; Walters, Knight, Grann, & Dahle, 2008) as well as other outcomes such as institutional aggression/misconduct (Douglas, Ogloff, Nicholls, & Grant, 1999; Douglas, Strand, Belfrage, & Fransson, 2005; Edens & Campbell, 2007; Guy, Edens, Anthony, & Douglas, 2005; Heilbrun, Hart, Hare, Gustafson, Nunez, & White, 1998). These findings support Hare's (2003) assertions that the antisocial facet should be included in the assessment of psychopathy to assist criminal justice system practitioners in identifying which offenders are most at risk of re-offending.

More generally, higher symptoms of psychopathy appear to be important indicators of both general and violent recidivism, whether measured using a three or four factor model of the PCL or even an entirely different instrument, (e.g., Corrado et al. 2004; Edens, Campbell, & Weir, 2006; Gretton, Hare, & Catchpole, 2004; Gretton, McBride, O'Shaugnessy, & Kumka, 2001; Harris, Rice, & Cormier, 1991; Hart, Kropp, & Hare, 1988; Kosson, Smith, & Newman, 1990; Porter, Birt, & Boer, 2001; Salekin, 2008; Salekin, Rogers, & Sewell, 1996; Schmidt, McKinnon, Chatta, & Brownlee, 2006; Vaughn & DeLisi, 2008; Vincent et al., 2008; Vincent, Vitacco, Grisso, & Corrado, 2003; Walsh & Kosson, 2007; Walters, Knight, Grann, & Dahle, 2008). However, this emphasis on testing psychopathy with a sole reliance on recidivism outcomes raises an additional key validity concern. As discussed by Lussier, McCuish, and Corrado (2015), such conceptualizations of offending persistence fail to properly account for differential likelihoods of recidivism over age. Moreover, the abovementioned studies failed to distinguish between offenders that recidivated as part of a downward trajectory (i.e., as part of the desistance process) and offenders that recidivate as part of an escalating trajectory. As such, when assessing the predictive validity of psychopathy it may be necessary to take additional steps to better capture an offender's broader criminal career (e.g., use psychopathy to predict long-term patterns of offending behavior).

3.2. Extending the Construct of Psychopathy to Youth

A diagnosis of psychopathy cannot be given until 18 years of age when personality syndromes are asserted to be fully stable (Hart, Watt, & Vincent, 2002). However, symptoms of psychopathy are evident as early as adolescence and even childhood (Obradovic, Pardini, Long, & Loeber, 2007). Barry, Frick, and Killian (2003) reported that children were capable of accurately assessing self-worth and that grandiosity (e.g., exaggeration or distortion of self-worth) was evident for some children. Developmentally, callous-unemotional (CU) traits have been identified as early as three years old (Dadds, Fraser, Frost, & HAwes, 2005). These traits were stable for most children (e.g., Frick et al., 2003) and associated with the early onset of antisocial behaviour (Frick, Cornell, Barry, Bodin, & Dane, 2003; Frick, Stickle, Dandreaux, Farrell, & Kimonis, 2005). In addition, based on PCL:YV scores, the prevalence of incarcerated youth scoring high on this instrument (15% to 25%) is similar to what has been found for adults (e.g. Gretton, Hare, & Catchpole, 2004; Vasey, Kotov, Frick, & Loney, 2005).

Given that personality traits are evident in adolescence and even early childhood (Rutter, 2005), Forth et al. (2003) believed that the construct of psychopathy could be measured in adolescence. To this end, these authors constructed a downward extension of the PCL-R, which Forth et al. (2003) termed the Psychopathy Checklist: Youth Version (PCL:YV). The PCL:YV was meant to be implemented amongst adolescents aged 12-17. Unlike the PCL-R, diagnostic cut scores on the PCL:YV were deemed inappropriate for categorically classifying adolescents as psychopathic versus non-psychopathic given that diagnoses cannot be made at this stage of development (Forth et al., 2003). Although the PCL-R is administered in the same manner as the PCL:YV, several of the adult items were adapted by Forth et al. (2003) to be more developmentally appropriate to the adolescent age-stage. These modifications included, first; including "impersonal sexual behavior" instead of "many short-term marital relationships". The second modification involved reducing the number of different types of crimes required to score at different levels of the item for "criminal versatility". Second, the PCL-R item "parasitic lifestyle" was termed "parasitic orientation" on the PCL:YV to reflect that a parasitic nature is likely more common among adolescents because of their continued need depend on others, such as parents, for financial and other forms of support.

Research on the PCL:YV as well as other measures of symptoms of psychopathy in adolescence support the conclusion that this construct can be reliability measured amongst youth (e.g., Barry et al., 2003; Brandt, Kennedy, Patrick, & Curtin, 1997; Dawson et al., 2012; Forth, Hart, & Hare, 1990). Although the assessment of symptoms of psychopathy in adolescence is generally reliable, the process of assessment is not without its challenges. Symptoms considered to be prototypical of the psychopathy construct in adulthood such as impulsiveness, stimulation seeking, irresponsibility, egocentricity, grandiosity, and manipulativeness (Kreis et al., 2012) were noted to by particularly prevalent, if not normative, in adolescence (Edens, Skeem, Cruise, & Cauffman, 2001; Seagrave and Grisso, 2002). Noting the prevalence of such symptoms, Forth et al. (2003) specified in their PCL:YV manual that raters must consider that the expression of these symptoms must be excessive or extreme and impair the youth's functioning.

Measurement of psychopathy in adolescence is further complicated by developmental principles of heterotypic continuity, equifinality, and multifinality (Hart, Watt, & Vincent, 2002; Lynam & Gudonis, 2005). Heterotypic continuity refers to the manner in which symptoms of psychopathy manifest differently over different developmental stages. For example, empathy in early childhood may be expressed through problems playing with peers. The same symptom may be expressed in adolescence or adulthood as the inability to understand the emotional needs of a partner (Hart et al., 2002). In other words, although the lack of empathy symptom may be present within the same individual across multiple stages of the life course, manifestation of the symptom may vary depending on age and related relational skill sets. Equifinality refers to how different developmental pathways can result in the same outcome. In the context of psychopathy research, the origins of the disorder may vary from biological/genetic influences to purely environmental experiences, or a combination of both genetic influence and environmental experience (Ogloff, 2006). Conversely, multifinality refers to a single developmental pathway (e.g., conduct problems in childhood) resulting in several distinctive later stage developmental outcomes that include but are not limited to psychopathy. For example, the presence of symptoms in childhood does not guarantee that these same symptoms will be present in adulthood. The instability of psychopathy symptoms at this stage is evidence for the efficacy of treatment (Skeem & Cauffman, 2003).

In addition to measurement challenges, there is the related concern that, in spite of evidence that symptoms of psychopathy may be more unstable in adolescence and more amenable to treatment compared to adulthood (Caldwell, Skeem, Salekin, & van Rybroek, 2006; Edens et al., 2001), justice systems might use psychopathic labels to possibly justify forgoing treatment in favor of longer sentences and placement in more secure institutions (Zinger & Forth, 1998). Currently, the criminal justice system has often used psychopathy to justify harsher legal outcomes, including longer sentences, placement in more secure institutions, lengthier parole eligibility dates, capital punishment/life sentences, and for youth, risk of transfer to adult court/adult sentences (Davidson, 2015; Zinger & Forth, 1998). For youth; however, Caldwell et al. (2006) showed that the perception that adolescents scoring high on measures of psychopathy were untreatable was false. If criminologists are to appropriately integrate psychopathy into existing explanations of offending, it is necessary to avoid these prior mis-perceptions of the utility of the construct for youth.

3.3. Concerns Regarding the Measurement and Use of Psychopathy within Criminology

In addition to the abovementioned concerns that are more broadly related to the assessment of psychopathy, there are also specific concerns about the manner in which criminologists have approached the use of psychopathy to explain involvement in offending. If psychopathy is to become an important construct for developmental criminology, it is critical to avoid these past errors. The effectiveness of psychopathy in contributing to explanations of offending trajectories is dependent upon the extent to which the construct can be captured within different samples and by different measurement tools. In this section data from the Incarcerated Serious and Violent Young Offender Study (ISVYOS) are used to help demonstrate concerns with (a) the manner in which prior empirical studies have measured psychopathy and (b) the types of populations sampled from to obtain data on psychopathy.

Beginning with Farrington's (2005) advocating for greater efforts to integrate psychopathy into explanations of offending, criminologists have been rather productive. No longer is psychopathy research specific to the field of forensic psychology. Through

these greater efforts there are some directions for moving criminologists' contribution to psychopathy research forward. It is perhaps due to the enthusiasm to address Farrington's (2005) recommendations that criminologists have focused less on psychopathy as a construct and more on ways to include measures of 'psychopathy' in statistical models. It is also possible that due to this enthusiasm, instead of creating new studies developed with the specific intention of measuring psychopathy, many researchers looked for expedient ways to measure psychopathy within existing criminology-based studies[10]. This approach has resulted in critical limitations of the current body of research on psychopathy and offending produced by the field of criminology. These limitations include: (1) conclusions about the predictive validity of psychopathy without the use of appropriately validated measures of the construct and (2) conclusions about the predictive validity of psychopathy made with an almost sole reliance on self-report measures.

Measurement Issues

There is a lengthy process involved in validating a measure of psychopathy within the field of forensic psychology. Twenty years after the development of the PCL-R and its derivatives, the PCL:SV and PCL:YV, debate continues regarding the number of factors that best describe the instrument (e.g., Cooke & Michie, 2001; Cooke, Michie, Hart, & Clark, 2004; Cooke, Michie, & Skeem, 2007; Hare & Neumann, 2005; Harpur, Hare, & Hakstian, 1989; Vitacco, Neumann, Caldwell, Leistico, & van Rybroek, 2006), whether antisocial behavior should be included as one of these factors (e.g., Hare & Neumann, 2010; Skeem & Cooke, 2010), whether the full range of interpersonal and affective symptoms of psychopathy are captured by this instrument (e.g., Cooke et al., 2004; Dawson et al., 2012; Sandvik et al., 2012), and whether the psychopathy construct is most appropriately described as dimensional or categorical (Murrie et al., 2007). These efforts have not been matched by researchers examining psychopathy within the field of criminology, and the absence of studies within criminology designed specifically to measure psychopathy have likely contributed to the lack of emphasis on construct measurement. Of specific concern is that, in some studies, psychopathy has been measured *ex post facto*, where items from pre-existing instruments designed to measure

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[10] The term 'criminology based' refers to studies published in criminology-oriented journals or by individuals trained in criminology rather than psychology. For an exception to this chapter's critique of such studies, see research published from the Pathways to Desistance Study.

other constructs are selected to measure psychopathy because of their resemblance to items from existing measures of psychopathy. In such studies, rather than examine factor structure via confirmatory factor analyses and other analytic strategies typically used to assess the validity of measures (e.g., Cooke & Michie, 2001), criminological studies simply assumed measurement was accurate on the basis of Cronbach's alpha values. Moreover, concurrent, convergent, and discriminant validity assessments critical to the development of measures such as the PCL:YV were missing from criminological studies.

Another measurement concern is criminology's almost sole adherence to the use of self-report measures, which do have some advantages, but also a large number of reliability and validity concerns (Hart & Cook, 2012; Lilienfeld & Fowler, 2006). Reliability concerns are largely an issue of method-mode mismatch. For example, given that persistent lying is considered an important symptom of psychopathy (Cleckley, 1976), the risk of inaccuracy within self-report instruments may be highest among the types of individuals whom researchers are most interested in understanding. Even if an instrument includes a measure of social desirability bias, such scales are not designed to capture subtle forms of manipulation that are most likely to be found among individuals with symptoms of psychopathy (Lilienfeld & Fowler, 2006). As further evidence of the method-mode mismatch, self-report instruments are typically completed well within an hour and therefore risk being influenced by the subject's mood state. On the other hand, expert rating scales typically involve multiple interviews with the subject and incorporate file-based information to cover a broader range of the subject's personality over their life course (Dawson et al., 2012).

Research Design Issues

Although the expediency of self-report instruments is often viewed as a strength (e.g., Lilienfeld & Fowler, 2006), there is a trade-off between economy and accuracy. Expert rating scales rely on file reviews and interviews with the subject (e.g., the PCL instruments) and allow for the measurement of inter-rater reliability to assess whether the construct is being measured accurately. The latter evaluation method is especially likely to be more accurate due to the inclusion of both subject and collateral informant information. Collateral information is particularly important because those with symptoms of psychopathy typically show a more serious lack of insight compared to non-

psychopaths (Lilienfeld & Fowler, 2006). Unlike self-report instruments that require respondents to answer a specific set of questions within a specific response format, expert rating scales are based on semi-structured interviews that allow the interviewer to re-phrase questions that the offender may have misunderstood or avoided answering directly. The ability to clarify answers is particularly important because the semantic aphasia often associated with individuals with psychopathy implies that they are more likely to misunderstand questions addressing affective deficits (Lilienfeld & Fowler, 2006).

Similar to criminology's use of *ex post facto* measures of psychopathy, Hart and Cook (2012) noted that most self-report instruments are not designed to measure psychopathy specifically and thus do not typically capture the full range of symptoms. Hart and Cook (2012) also noted that, unlike expert rating scales, self-report instruments have only low to moderate temporal stability and low to moderate concurrent validity with other measures of psychopathy. With regard to concurrent validity, self-report instruments appear most limited with respect to capturing interpersonal and affective deficits (e.g., Hare, 1985; Harpur et al., 1989; Sellbom, 2011). Most critically for criminological theories, these instruments have not shown sound predictive validity regarding involvement in serious antisocial behavior (Hart & Cook, 2012). Problems with the use of the psychopathy construct also extend to the research design stage, where there have been problems with the misspecification of independent and dependent variables, indicating confusion with manifestations of symptoms of psychopathy. For example, although high rate and versatile substance use is used as an indicator of the stimulation seeking item within the PCL:YV (see Forth et al., 2003), some argue that drug use *increases* the prevalence of symptoms of psychopathy (e.g., Pardini, Bechtold, Loeber, & White, 2015). An alternative interpretation to Pardini et al.'s (2015) finding is that changes in levels of drug use reflect heterotypic continuity associated with personality disorders like psychopathy.

Another research design limitation that has been characteristic of almost all existing studies on psychopathy in criminology is the reliance on general population samples[11]. This research design strategy is understandable given that the most influential criminological longitudinal studies have focused on the development of offending more

[11] Of the limitations presented, this limitation is likely affected the most by the lack of new longitudinal studies in the field of criminology.

broadly and therefore emphasize generalizability. However, studying the influence of psychopathy within general population samples where, typically, there is little variance in symptoms of this disorder poses several challenges, even when psychopathy is viewed as a dimensional construct. For example, in the MacArthur Violence Risk Study, 50% of the sample scored either a zero or one on the PCL:SV (Neumann & Hare, 2008). Similarly low scores were observed within the Cambridge Study in Delinquent Development (Piquero et al., 2012). It is also important to consider the construct validity issue that scores on an instrument designed to measure psychopathy do not necessarily reflect symptoms of psychopathy. For example, an individual with a drug addiction may have a parasitic orientation, may be irresponsible, and may engage in reckless behavior. These can all be symptoms of psychopathy, but they also may be consequences of an offender's drug addiction, and there is little evidence that drug addiction influences the development of symptoms of psychopathy (cf., Pardini et al., 2015). Nevertheless, this drug addicted individual in a community sample would likely score higher on the PCL:SV than at least 50% of participants from the MacArthur Violence Risk Study.

Low average scores on measures of psychopathy in community studies is especially concerning when scores pertaining to interpersonal and affective deficits are not reported. It leads to the question of whether higher scores on the instrument simply reflect higher levels of low self-control (e.g., the lifestyle facet from PCL instruments). For example, despite scores of 16-18 indicating 'high' scores on the PCL:SV, only 8% of men from the Cambridge study[12] scored ten or higher (Piquero et al., 2012). To what extent are core interpersonal and affective symptoms represented within this group? In a more recent study, Auty, Farrington, and Coid (2015) reported that men from the Cambridge study averaged a score of 1.17 (out of 12) on Factor One (F1) of the PCL:SV (the interpersonal/affective factor). Even more importantly, scores on this facet ranged from 0-8, indicating that none of the sample presented with the full range of interpersonal and affective symptoms described by this instrument. Average scores on Factor Two (F2) of the PCL:SV (lifestyle/behavioral factor), although also low, were twice as high compared

[12] The contributions made by researchers examining the Cambridge study are enormous, and the critique here is not meant to be a general critique of the study. Rather, the critique presented is common to many studies in criminology, and the decision to specifically focus on the Cambridge study was due to the familiarity and weight this project holds among researchers.

to F1 scores. This suggests that within community samples, the individuals identified as scoring 'high' on symptoms of psychopathy (e.g., '10' on the PCL:SV in the Piquero et al., 2012 study) may be more reflective of their F2 score than by their score on the factor measuring core symptoms of psychopathy (F1).

To assess this concern, PCL:SV scores amongst individuals (n = 203) from the Incarcerated Serious and Violent Young Offender Study (ISVYOS) were used to examine whether individuals with PCL:SV[13] scores that represented the *typical* 'high' score were more likely to have achieved that score due to higher scores on items reflecting lifestyle and behavioral PCL:SV items (F2) compared to individuals with *atypical* 'high' scores. Based on PCL:SV scores from community data, the vast majority of individuals defined as scoring 'high' on the PCL:SV received scores ranging between 10-14 (see Neumann & Hare, 2008; Piquero et al., 2012). Therefore, individuals with scores on the PCL:SV between 10 and 14 were determined to be indicative of the '*typical'* high scorer and individuals with a score of 15 or greater were determined to be indicative of the '*atypical'* high scorer. Chi-square measures of association indicated that individuals with typically high PCL:SV scores ($n = 64$) were significantly ($\chi^2 = 5.81$, $p < .05$) more likely than those with atypically high PCL:SV scores ($n = 108$) to have an F2 (lifestyle/behavioral) score that was equal to or greater than their F1 (affective/interpersonal) score (see Figure 3.2). This indicated that individuals with a score that would typically indicate 'high symptoms of psychopathy' in a community study would be more likely than individuals with atypically high scores to have their score driven by items reflecting behavioral impulsivity than by interpersonal and affective deficits. To illustrate this concern in another way, the percent of an individual's total score that was accounted for by F2 was examined. Using independent samples t-tests, individuals with typically high scores on the PCL:SV had a significantly ($t\,(107^{14}) = 3.52$, $p < .01$) higher percentage of their total score accounted for by F2 compared to individuals scoring atypically high on the PCL:SV (see Figure 3.1).

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[13] The sample included all young offenders, but the PCL:SV includes an item measuring 'adult criminal behavior'. This item was omitted F2 scores were pro-rated. F1 and F2 scores were thus still scored with the same scale range (0-12).

[14] Levene's test was violated, equal variance was not assumed.
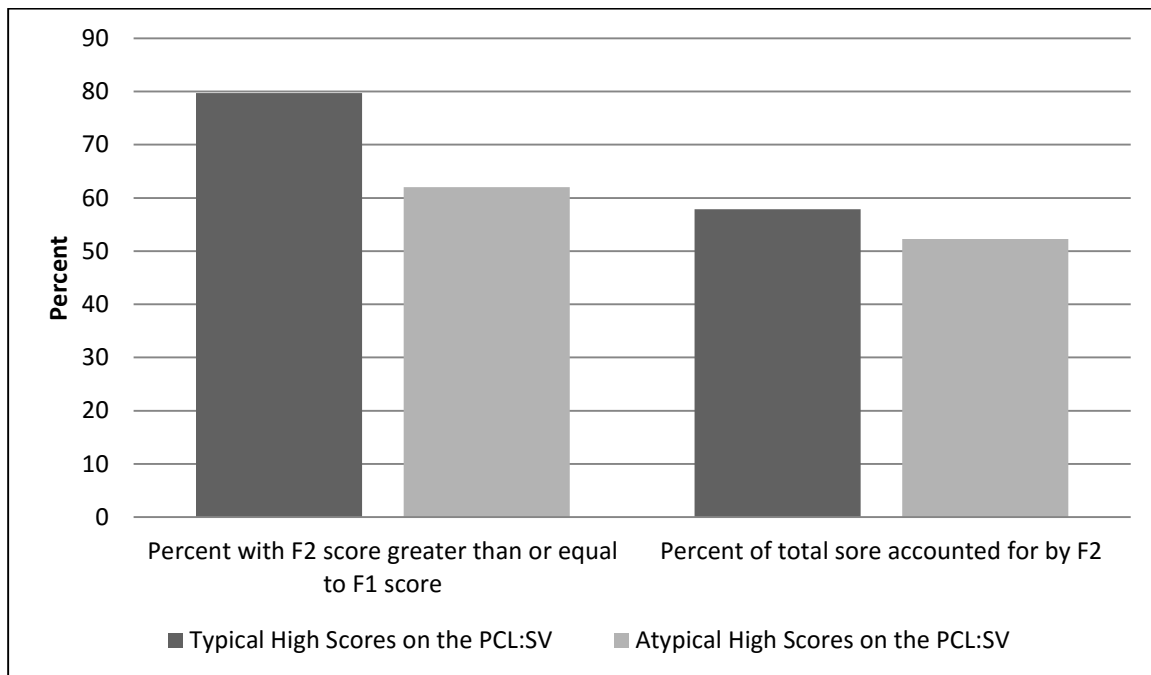
Figure 3.1: Chi-square and t-test analyses indicating that typical 'high' scores on the PCL:SV are more likely to be a result of F2 scores than F1 scores compared to atypical 'high scores'. *Note.* **F2 = Factor Two; F1 = Factor One**

When PCL:SV scores are more appropriately treated as dimensional to reflect the dimensionality of psychopathy, similar results are observed. A Pearson correlation was performed on the full sample ($n = 203$) to examine the correlation between PCL:SV total scores and percent of score accounted for by F2. A significant, moderate, and negative correlation was observed ($r = -.470$, $p < .001$). As scores on the PCL:SV decreased, the percent of the total score accounted for by F2 increased. In effect, what may be the basis for these higher psychopathy scores is not core interpersonal and affective symptoms, but measures of criminal behavior, behavioral problems, and impulsivity. Within prior community-based studies of the relationship between psychopathy and offending, conclusions about the predictive validity of psychopathy may instead be more accurately interpreted as the predictive validity of low self-control and prior behavioral problems/criminality. Thus, the concern is that participants in community studies that are purported to typify 'high psychopathy' are individuals whose symptom profile is more likely reflective of issues with low self-control than of psychopathy.

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This does not imply that community-based studies should not attempt to measure psychopathy and study its predictive validity. In agreement with Sellbom (2011), this type of research is needed to move the field of psychopathy research forward. However, the validity concerns discussed can only be fully addressed with larger-scale community studies that capture the full range of symptoms of psychopathy with measurement tools that capture core affective and interpersonal symptoms. For advancing the incorporation of psychopathy into criminological theories, greater attention should be given to ensuring that the psychopathy construct be more fully measured before assessing its predictive validity. Additionally, future research strategies need to account for the rarity of high symptoms of psychopathy in the general population. Once this is done, criminological theories relying on psychopathy as an exploratory construct should focus on a narrower scope of the most serious or criminal behaviors.

3.4. The Importance of Psychopathy to the Field of Criminology

Addressing the abovementioned measurement and research design issues is critical because of the potential value that the psychopathy construct has to the field of criminology. Not surprisingly, as the pioneer who developed the "gold standard" instrument for psychopathy, Hare (1998) described psychopathy as perhaps the most important risk factor for the criminal justice system because the construct could meet this purpose of differentiating risk of offending among individuals known to the criminal justice system. Constructs such as psychopathy that can explain within-group variations *among* offenders, especially variations between relatively minor offenders and the small group of offenders responsible for the majority of all crime are missing from nearly all traditional and even many contemporary criminological theories or models of offending (e.g., Wolfgang, Figlio, & Sellin, 1972). With few exceptions, both traditional and modern theories/developmental models of crime (Agnew, 1992; Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979; Farrington, 2005; Gottfredson & Hirschi, 1990; Moffitt, 1993; Sampson & Laub, 2005; Thornberry, 2004) generally have not made reference to personality constructs commonly discussed in forensic psychology (for exceptions see DeLisi & Vaughn, 2014; Vaughn & DeLisi, 2008; Fox, Jennings, & Farrington, 2015). In addition to

lack of disciplinary crossover within criminological theories, there appears to be a preference for parsimony and the use of simple and essentially one-dimensional explanatory criminological constructs compared to complex, multidimensional, and multi-indicator constructs common in the personality based theoretical framework common to forensic psychology (Patrick, 2010; Salekin & Lynam, 2010). Preference for parsimony is especially limited when one dimensional constructs are essentially borrowing aspects of multidimensional constructs. The general theory of crime, for example, exemplifies this theme given that it is based fundamentally on one psychopathy-like symptom—low self-control—to account for offending[15].

The second explanation for the failure to specify such constructs in existing theoretical models relates to the rarity with which serious offenders are examined (Mulvey et al., 2004; Rosenfeld, White, & Esbensen, 2012). The purpose of this dissertation is to begin to identify constructs that help address the question of why some adolescent offenders become involved in chronic offending, persistently serious offending, or persistently violent offending, whereas other adolescent offenders become involved in relatively ubiquitous offenses which are committed at a low frequency and over a shorter period of time. Psychopathy is perhaps the most obvious construct to start with in the attempt to address this type of question. In a series of prior studies, DeLisi and colleagues (e.g., DeLisi & Piquero, 2011; Vaughn & DeLisi, 2008; Vaughn, Howard, & DeLisi, 2008) hypothesized that the similar prevalence of psychopathy and chronic offending was not a coincidence; rather, the approximately five percent of the offender population scoring high on measures of psychopathy were also the same five percent of the offender population meeting the criteria for designation as a chronic offender. In effect, this series of research specified psychopathy as a construct that could theoretically account for why some offenders continue to offend across the life course whereas others desist during adolescence.

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[15] Contrasting the unidimensional nature of the general theory of crime is the complex and multi-trait Five Factor model of Personality that has been the standard in psychology (Lynam, 2010). Although parsimony is a valuable attribute of criminology theories, there is also little doubt that temperament, if not personality themes, have been part of, if not essential to, some of the key criminological theories historically (e.g., DeLisi & Vaughn, 2014) and increasingly so in the last several decades (Fox et al., 2015). It is the recognition of the complexity of criminal careers (Piquero, 2008) that helps support the need for a more complex, multidimensional theory of offending.

It is very important; however, to specify the extent to which psychopathy can contribute to explanations of offending. Psychopathy represents a narrow, specific, and rare form of personality in the general population (e.g., Skeem & Mulvey, 2001), whereas general offending represents a broad, generic, and common form of behavior in the general population (e.g., Le Blanc & Fréchette, 1989; Moffitt, 1993). Using a precise instrument to hit a broad target implies that there is much more of the target to be explained. It therefore is inappropriate to argue that psychopathy (a precise instrument) is useful for explaining general offending (a broad target) given that the former is unable to capture the scope of the latter. However, as the target narrows and becomes rarer (e.g., from general offenders to 'chronic' offenders), hitting that target requires a greater level of precision than is found with brad constructs such as low self-control (see Figure 3.1 for an illustration of this discussion). Indeed, a large number of studies examining hyperactivity, impulsivity, and other symptoms of low self-control found that these constructs did not vary between chronic and non-chronic offenders (Day et al., 2012; Fergusson et al., 2000; Landsheer & van Dijkum, 2005; Odgers et al., 2008; Piquero, 2008; van der Geest et al., 2009; van Domburgh et al., 2009). However, there does appear to be an overlap between the prevalence of psychopathy and the prevalence of chronic offenders (Vaughn & DeLisi, 2008). At least tentatively then, psychopathy appears to be the type of precise construct necessary to explain the causal mechanisms responsible for the rarer but extremely important (Mulvey et al., 2004; Rosenfeld et al., 2012) chronic, serious, and violent (CSV) offending trajectories.
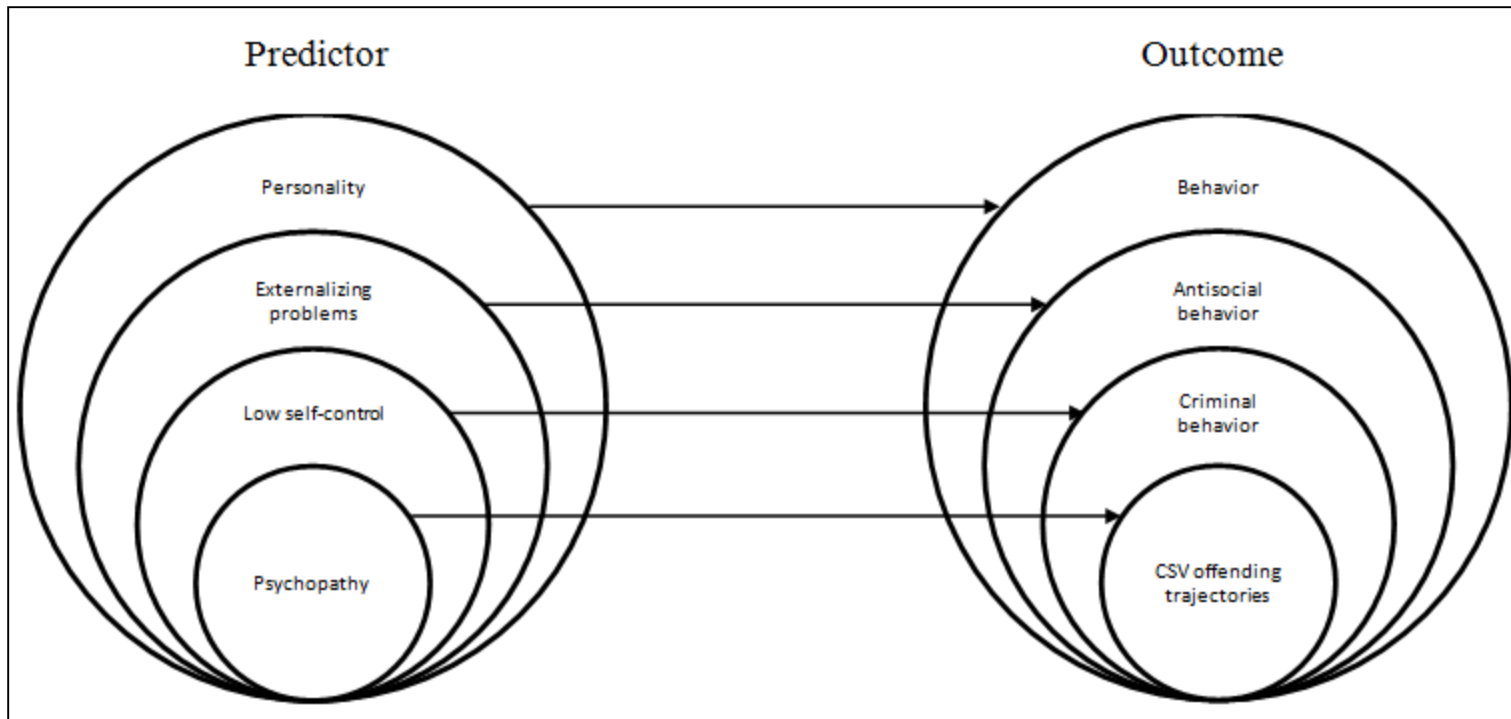
Figure 3.2: An illustration of the specificity psychopathy and the similar specificity of chronic, serious, and violent offending trajectories

By focusing on CSV offending trajectories, the group of offenders that psychopathy is hypothesized to help explain is quite small in scope, yet consistent with concerns about the discrepancies in the prevalence of symptoms of psychopathy in general population samples versus their prevalence in offending samples. Explaining why relatively few individuals persist in offending across the life course has indeed been a long-standing focus of criminological theories and research (e.g., DeLisi, 2005; Nagin & Land, 1993; Moffitt, 1993; Tracy, Wolfgang, & Figlio, 1990; Wolfgang et al., 1972). A greater challenge has been identifying covariates that help discriminate between offending trajectories limited to adolescence and offending trajectories that begin offending in childhood or adolescence and continue throughout adulthood stages (Blokland, Nagin, & Nieuwbeerta, 2005; Day et al., 2012; Fergusson, Horwood, & Nagin, 2000; Landsheer & van Dijkum, 2005; Nagin, Farrington, & Moffitt, 1995; Odgers et al., 2008; van der Geest, Blokland, & Bijleveld, 2009; van Domburgh, Vermeiren, Blokland, & Doreleijers, 2009; Ward et al., 2010).

That psychopathy is suitable for the explanation of these trajectories is not a novel assertion. For instance, DeLisi and Vaughn (2008) argued that the relationship between psychopathy and crime variables may be strongest when examining serious and violent offenders. Historically, they traced comparisons between the prevalence of psychopathy and the prevalence of Wolfgang's chronic offenders in one of the original and classic cohort studies, and called for more research connecting these two groups across the life course. The asserted relative stability of psychopathy (e.g., Lynam, Loeber, & Stouthamer-Loeber, 2008) implies that an individual with symptoms of psychopathy will be at a continued risk to offend throughout the life course. This theory and policy related analysis perspective requires prospective longitudinal research that utilizes more than simple measures of recidivism, which exclude important parameters of criminal careers and, therefore, cannot accurately identify the heterogeneous and heterotypical chronic, serious, and violent offending trajectories (Lussier, McCuish, & Corrado, 2015; McCuish et al., 2015). Again, the intended scope of this tentative explication of the role of psychopathy in the development of offending necessarily focuses more narrowly on CSV offending trajectories.

Nagin (2005) described a trajectory as a quantitative pattern of offending over time that captured important criminal career parameters such as onset, persistence, and desistance. Trajectories can therefore be used to explain the evolution of crime across the life course (Nagin, 2005; Nagin & Tremblay, 2005). Specification of the symptoms of psychopathy acting as causal mechanisms of CSV offending trajectories is only useful if these CSV trajectories can be identified in statistical models that facilitate the testing of psychopathy as a predictor of different trajectories. Reviews of existing trajectory studies (e.g., Jennings & Reingle, 2012; Piquero, 2008) provide tentative empirical support for the assertion that although offending is best described by a continuous distribution, this distribution can be approximated by discrete categories (trajectories) of offenders that may reflect distinct etiologies (Nagin, 2005). CSV offending trajectories represent three of these discrete categories, and symptoms of psychopathy represent the etiological factor responsible for the specific course of offending behavior. Below, the hypothesized causal mechanisms describing *why* psychopathy might be related to these types of offending trajectories is outlined in greater detail. These causal mechanisms are not directly tested in this dissertation, but nevertheless it is important to begin specifying not just *who* engages in crime, but *why* crime happens (see Wikstrom & Treiber, 2016).

3.4.1.   The Chronic Offending Trajectory

Chronic offending trajectories describe involvement in a high-rate and versatile pattern of offending that persists across the life course (at least until mature adulthood). This trajectory pattern has been identified in virtually all trajectory studies, regardless of sample type (Jennings & Reingle, 2012; Piquero, 2008), though many of these studies did not provide examples of true life course persistent offenders since the length of follow-up rarely extended into middle adulthood (c.f., Blokland et al., 2005; Sampson & Laub, 2003). The chronic offending trajectory is expected to consist of offenders frequently involved less serious offenses (e.g., property offenses, violating conditions of court orders, minor assaults). Similar to Gottfredson and Hirschi's (1990) classic relationship between low self-control and offending, involvement in these offenses likely requires a risky/opportunistic lifestyle that provides the consistent offending opportunities. This routine pattern of offending opportunities typically requires relatively little skill, planning, or effort to facilitate a chronic criminal career. Certain symptoms of psychopathy will not

only influence chronic offending, but also the likelihood of a particular lifestyle exposing the offender to the opportunities required for involvement in a chronic criminal career. Specifically, individuals with a number of behavioral symptoms of psychopathy can be characterized as impulsive, sensation seeking, and irresponsible, which likely will influence the offender's lifestyle in various ways. For example, such an individual will likely be disinterested in school or maintaining employment, freeing up their time to be involved in antisocial activities. Substance abuse is also a characteristic of individuals scoring high on the lifestyle facet of the PCL:YV (e.g., Forth et al., 2003). A drug-using lifestyle will help create offending opportunities through (a) the pharmacological effects of different substances, (b) the financial needs of the user, and (c) the culture of violence associated with the drug market (Goldstein, 1985). In the absence of involvement in conventional activities (e.g., school and work) to occupy time and address financial needs, combined with involvement in substance use and other risky activities, individuals characterized by certain symptoms of psychopathy are likely to be frequently exposed to offending opportunities. Behavioral symptoms will also be primarily responsible for the likelihood that an offender will capitalize on these opportunities and to react to offending opportunities due to behavioral symptoms similar to low self-control (Gottfredson & Hirschi, 1990).

3.4.2.   The Serious Offending Trajectory

A less chronic but more serious offending trajectory describes individuals that spend a substantial amount of time in custody, especially relative to their total number of convictions. This greater amount of time incarcerated is related to this group's tendency to commit both violent and non-violent offenses of a serious nature at a consistent rate across the life course. The frequency of offending for this group is lower than for the chronic offending trajectory particularly because serious offenders will spend a greater amount of time incarcerated. For these persistently serious offenders, their symptoms of psychopathy are not seen as compelling them specifically to offend. Instead, these offenders are characterized by a strong imperative to exert interpersonal dominance over others. Involvement in serious offenses represents one outlet for satiating this deeply embedded motive. These individuals do not engage in a high rate of offending characteristic of the chronic offending trajectory. Behavioral symptoms may also play a

role. For example, impulsivity and sensation seeking may constitute a barrier to accessing non-criminal outlets to address their desire to interpersonally dominate others.

3.4.3. The Violent Offending Trajectory

Finally, violence trajectories describe individuals involved in a high rate of predominantly (but not exclusively) acts of violence. Violent offending that persists across the life course requires a personality profile dominated by a lack of attachment to others combined with the absence of emotional depth and unstable emotions. In their situational action theory, Wikström and Treiber (2009) specify the different symptoms that would (a) increase an individual's propensity for violence, (b) create an environment around the offender conducive to violence, and (c) reduce the likelihood that the offender would be deterred from involvement in violence. Wikstrom and Treiber's (2009) notion of propensity for violence is hypothesized to be primarily influenced by higher scores on the lifestyle facet of the PCL:YV. These authors' situational component of violence involvement is expected to be influenced by interpersonal symptoms that create conflict with others. Finally, the deterrence aspect of situational action theory is expected to be negated by affective symptoms that prevent attachment or emotional connection to others. Emotional and attachment deficits have long been hypothesized to be associated specifically with violent behavior (Hare, 1981; Harpur & Hare, 1994; Harris, Rice, & Cormier, 1991; Hart & Dempster, 1997; Weiler & Widom, 1996; Yablonsky, 1970). Those offenders falling towards the highest end of this spectrum of emotional deficits are expected to be most strongly associated with a criminal career characterized by persistent violence.

3.5. Integration of the Psychopathy Construct within Different Theoretical Perspectives on Desistance

Given developmental and life course researchers' interest in studying longitudinal patterns (Elder, 1985; Laub & Sampson, 1993; Loeber & Le Blanc, 1998; Moffitt, 1993), it is unsurprising that much of the current research on desistance evolved from these two areas of research. Indeed, critical changes in the notion of how desistance should be defined, measured, and analyzed were stimulated by researchers within this field (see Chapter One). Very much in contrast to the work on desistance by these two areas, the

manner in which psychopathy has been measured and utilized by developmental and life course researchers deserves more criticism than praise (Corrado et al., 2015). Psychopathy's (a) neglect or (b) misuse within criminological literature is unfortunate given Fox et al.'s (2015) demonstration of the manner in which psychopathy can easily be incorporated into core theories and perspectives used within the developmental and life course framework.

The psychopathy construct can also be incorporated into existing desistance theories to describe how specific symptoms may either prevent or disrupt factors responsible for initiating or maintaining the desistance process. Considering that psychopathy is commonly connected to chronic offending (e.g., DeLisi, 2009) and that desistance is, if not only, at least primarily relevant to the study of relatively serious offenders (Farrington, 2007; Kazemian, 2007), the psychopathy construct may be particularly well suited for understanding why desistance does not occur for some offenders. The primary reason for specifying psychopathy as a barrier to desistance as opposed to a risk factor for persistence is to understand the manner in which desistance theories will be of limited theoretical value to populations consisting of a relatively substantive portion of individuals that would score high on standard measures of psychopathy. As a secondary rationale, psychopathy is a personality disorder (Hare, 2003). Individuals do not 'choose' psychopathy; rather, there is no consensus about the causes of psychopathy other than that there are a variety of possible sources including biological/genetic influences, environmental experiences, and a combination of the former broad categories of factors (Ogloff, 2006). As such, care should be taken to avoid the stigmatization associated with psychopathy and the myth that treatment is not helpful (Salekin, 2006). In other words, the constant framing of psychopathy as an explanation for persistence could lead to policy makers using psychopathy assessments as a justification for lengthy sentences and the foregoing of treatment (Davidson, 2015). Re-framing symptoms of psychopathy as a barrier to desistance invokes a more humanistic response to this type of offender.

Theoretical perspectives on desistance have emerged largely from within existing paradigms/theoretical frameworks. Lussier, McCuish, and Corrado (2015) outlined three

non-mutually exclusive perspectives regarding the desistance process[16]. The first incorporates two theories regarding desistance from crime: (a) age-based maturation and (b) cognitive changes in self-identity that influence stake-in-conformity. This maturation and identity change hypothesis is consistent with two predominant, but polar opposite, theories. The maturation theory aligns with Gottfredson and Hirschi's (1990) general theory of crime. Desistance occurs simply due to the biological effects of aging. The cognitive change theory, consistent with Maruna's (2001) description of human agency, specifies that desistance occurs via age-graded within-individual change in cognitive perceptions and identity. The first theory specifies the importance of biological aging, whereas the second theory specifies the importance age-based social roles. The second desistance perspective is rooted in Clarke and Cornish's (1985) description of rational choice. Cusson and Pinsonneault (1986) argued that desistance occurs when an offender concludes that the benefits of involvement in crime are outweighed by both formal and informal consequences. The third perspective specifies the role of human development and turning points in the desistance process (see Laub & Sampson, 2001; Laub & Sampson, 2003; Sampson & Laub, 2003; Sampson & Laub, 2005). Like the maturation and identity change perspective, the third perspective is examined from two different theories, life course theories and developmental theories. Although these theories are not mutually exclusive, they are often presented as competing theories (Laub & Sampson, 2001). From the life course perspective, informal social controls and social structure facilitate the desistance process. From a developmental perspective, early life experiences initiate a process of cumulative disadvantage, decreasing the likelihood that a particular turning point will occur or have a beneficial effect for this individual (e.g., Moffitt, 1993), a principle that life course theorists argue is too deterministic (Sampson & Laub, 2005). For conceptual clarity, developmental and life course perspectives are presented as separate perspectives. After each theoretical perspective is described, the notion of psychopathy as a barrier to desistance is explicated by giving attention to the role of specific symptoms in interrupting the desistance process.

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[16] In some cases, a theory is commonly directly informed by one specific conceptualization of desistance. Life course theory is most often tested using the desistance as a process conceptualization. However, as it is not necessary to test a theory using just one specific definition of desistance, this section does not focus on linking theories to specific conceptualizations of desistance.

3.5.1.   The Maturation and Identity Change Perspective

The over-arching theme within this perspective is that maturation and identity change are both products of age, and therefore explanations of desistance require modeling within-individual change over time. Within this hypothesis; however, there are different theoretical perspectives regarding the specific causal mechanisms influencing desistance. One theory, resembling Gottfredson and Hirschi's (1990) general theory of crime, is that the biological effects of aging represent the sole causal mechanisms influencing maturation and identity change. As individuals age, greater constraints are placed on free time, and the energy, strength, and will to continue offending dissipates. Here, biological effects of age are solely responsible for desistance. Sweeten, Piquero, and Steinberg (2013) tested this hypothesis by examining the extent to which age accounted for declines in crime after controlling for approximately 40 criminogenic factors inspired by several different criminological theories. Unlike Gottfredson and Hirschi's (1990) expectation, most of the change in crime could be accounted for by sociological and psychological risk/protective factors (see Sweeten, Piquero, & Steinberg, 2013).

Very much in contrast with the Gottfredson and Hirschi (1990) perspective is the human agency perspective. According to this theory, relatively normative identity and cognitive transformations are expected as an individual ages (Maruna, 2001). For example, adolescents making the transition to adulthood typically become more emotionally stable, interpersonally more sophisticated and skilled, and intellectually more knowledgeable and more future-oriented (Arnett, 2000). Part of the reason for these changes are related to known biologically-induced changes in brain maturation (Baird, Kagan, Gaudette, Walz, Hershlag, & Boas, 2002; Corrado & Mathesius, 2014). These changes, in turn, increase moral reasoning, reduce impulsivity and facilitate more future-oriented goals and planning. When it comes to serious and violent offenders, several risk factors may delay or even prevent maturational progress.

Psychopathy and the Maturation and Identity Change Perspective

The hypothesis that desistance occurs as a result of aging is likely the theory least conducive to the incorporation of the psychopathy construct. There is no research testing whether symptoms of psychopathy increase or decrease the biological effects of aging.

However, given the high-risk lifestyles associated with psychopathic personality disturbance (e.g., drug use and other sensation activities that increase health risks), biological effects of aging may 'speed up' for psychopaths. At the clinical level, the concept of 'burn-out' has been argued to be more likely for psychopaths than non-psychopaths due to their likelihood of injury associated with living a criminal lifestyle (Hare, McPherson, & Forth, 1988). However, this notion remains purely conceptual; there is no current research on the health outcomes of individuals with psychopathy. Future research could examine the relationship between psychopathy symptoms and an early death. At the same time, if burn-out is more likely among individuals with psychopathy, they should desist faster than other offenders, which does not appear to be the case (e.g., Gretton et al., 2010; Piquero et al., 2012). In effect, if symptoms of psychopathy were associated with an earlier death or increased health risks, research indicates that individuals with psychopathy offend at a higher rate *despite* being more likely to experience the effects of aging sooner and more intensely. As others have noted (e.g., Eggleston et al., 2004; Sampson & Laub, 2003), accounting for death is critical for identifying 'false desisters'. If there is an association between psychopathy and poor health outcomes, symptoms of psychopathy may not be a barrier to desistance but rather increase the likelihood of finding false desisters. Given the existing relationship between psychopathy and offending, failing to account for death may simply lead to under-estimations of the effect of psychopathy on offending.

Notions of maturation and human agency producing changes in cognitive perceptions and self-identity (Maruna, 2001) is in contrast with both broad and specific notions of psychopathy. Broadly, personality disorders, including psychopathy, are expected to remain stable over the life course (Lynam et al., 2007). Due to this stability, age-based maturation and identity shifts are unlikely to take place, especially at the adulthood stages. More narrowly, according to prevailing definitions of psychopathy determined through prototypicality studies (e.g., Cooke et al., 2012; Hoff, Rypdal, Mykletum, & Cooke, 2012; Kreis & Cooke, 2011), cognitive inflexibility is a symptom of psychopathy. Cognitively, individuals with psychopathy are intolerant of others, meaning they are less likely to adopt changes in their identity that support movement towards more prosocial peer connections. Self-perceptions of individuals with symptoms of psychopathy include the belief of superiority, a sense of being special, unique, and deserving or entitled

to privileges that others do not deserve. These perceptions of self will likely shape an offender's belief that they do not require change. Essentially, the very nature of psychopathy is counter-productive to the development of the causal mechanisms necessary for desistance according to this theoretical perspective.

3.5.2. The Rational Choice/Deterrence Perspective

According to the rational choice or deterrence perspective, formal and informal consequences initiate desistance (Clarke & Cornish, 1985; Cusson & Pinsonneault, 1986). Formal consequences refer to official criminal justice interventions. As an individual's level of offending increases, they become more well-known to police and other arms of the justice system. This reputation increases surveillance and the likelihood of detection. If this offender is detected, their prior criminal record will typically be used to justify a lengthier sentence, and thus becomes another factor contributing to the offender's perception that the costs of offending are outweighed by the benefits. Cusson and Pinsonneault (1986) outlined five aspects of formal consequences that influence desistance: (a) offenders believe they are less likely to avoid detection; (b) offenders find the prison experience more challenging; (c) offenders experience an increased fear of a lengthy prison sentence, and (d) the fear, anxiety, and stress of being caught becomes overwhelming, and (e) the implications of imprisonment on other life domains (e.g., family, employment) acts as a deterrent.

On the other hand, informal consequences refer to negative experiences of the crimes themselves and their impact on various areas of functioning. Through their interviews with former offenders, Cusson and Pinsonneault (1986) described different 'shocks' that marked turning points in an offender's decision to desist. These shocks included real and perceived injuries associated with involvement in offending (e.g., victim resistance, violence from co-offenders), the death of co-offenders/accomplices, suicide by individuals within an offender's criminal network, and confrontations with police. Cusson and Pinsonneault (1986) asserted that the shock experience lead to the cognitive transformation of the self required for desistance. This rational choice perspective shares some conceptual overlap with Maruna's (2001) theory, but is based on the cumulative impact of formal and informal sanctions, rather than changes in identity through human

agency and the adoption of new social roles associated with age-related maturation. Based on available empirical evidence, there are some concerns with a purely rational choice based perspective of desistance. For example, repeated contact with the criminal justice system actually lowers offenders' perception of being caught and convicted for crimes they expect to commit in the future (Pogarsky & Piquero, 2003; Shover & Thompson, 1992), especially for serious violent offenses such as homicide (Sorensen, Wrinkle, Brewer, & Marquart, 1999). Greater attention to the broader role of informal social controls is likely required, as the presence of such factors may increase the costs of offending to an offender.

Psychopathy and the Rational Choice/Deterrence Perspective

Given the emphasis within the psychopathy literature on the inability to deter this type of offender (Caldwell et al., 2006), the manner in which the rational choice perspective can be used to explain desistance amongst individuals with psychopathy seems limited. Similar to the manner in which psychopathy may act as a barrier to identity change/cognitive transformation, specific symptoms of psychopathy may affect the likelihood of deterrence. For example, symptoms of impulsivity and a lack of planfulness may decrease the likelihood that an offender considers the consequences of their behavior. The likelihood of danger or risk of injury may be a deterrent for some offenders, but with symptoms of sensation seeking being part of the psychopathy construct (e.g., Cooke et al., 2012), particularly dangerous or high-risk offenses may be an attraction to some offenders with symptoms of psychopathy. As well, informal consequences of offending such as the death of co-offenders will be less likely to deter offenders with symptoms of psychopathy because these individuals do not tend to form intimate or meaningful attachments with others (Cooke et al., 2004).

The typical hedonistic drives associated with the psychopathy construct mean that symptoms will not only act as barriers to desistance, but quite likely explain involvement in continued offending. The manner in which individuals with symptoms of psychopathy will be more strongly attracted to illegitimate opportunities can be explained through indifference curves. The level at which legitimate opportunities become a reasonable alternative to illegitimate opportunities may require a higher threshold curve for individuals with symptoms of psychopathy. Using a rational choice model, X_1 can be plotted on the X

axis to represent an individual's legitimate opportunities and X_2 can be plotted on the Y axis to represent the same individual's illegitimate opportunities. A line drawn from the X axis to the Y axis can be used to illustrate the maximum budgeted time/effort for legitimate (P_1) and illegitimate (P^2) opportunities. Somewhere along this budgeted line is the actual behavioral output of the individual. Further up the line would indicate a greater amount of time required to pursue an offending opportunity, whereas further down the line represents a greater amount of time spent on legitimate activities.

Indifference curves can be drawn to help understand an individual's preference. At any point along this curve, the individual is satisfied with the outcome (e.g., allocation of time and opportunity to the balancing of legitimate and illegitimate activities). This notion of indifference curves is in line with the idea that it is simply not possible to pursue any one activity-type at all time. Although an indifference curve may mark an individual's preference, sometimes preference may not be attainable due to time constraints or an unrealistic expendable effort. Therefore, an indifference curve that more closely conforms to the line from the X axis to the Y axis marking P_1 and P_2 time/effort for legitimate and illegitimate opportunities, respectively, will mean a greater likelihood that the individual can achieve a particular opportunity. In other words, a given point on an indifference curve will not necessarily be a realistic opportunity for an individual given the amount of time they have allocated to a legitimate or illegitimate opportunity. Very importantly, this model is not fixed. That is, the cost of doing crime as defined by P_2 can change. The question then becomes, for a given individual, how much do the costs of crime have to increase before none of the points along the indifference curve are realistic for the individual?

Symptoms of psychopathy might act as a barrier to desistance because the threshold at which the costs of doing crime exceed the offender's time/effort is likely higher compared to a typical offender. In other words, for individuals with symptoms of psychopathy, the *availability* of their time to pursue legitimate opportunities is limited by their general antisocial lifestyle. Moreover, the *amount* of time that such an offender needs to accomplish legitimate opportunities is likely lower compared to individuals without certain symptoms of psychopathy. For example, given the impulsivity, lack of long-term goals, and lack of perseverance characteristic of individual with psychopathy (Cooke et al., 2004), the amount of time this offender is willing to spend on the pursuit of legitimate

opportunities is quite low. In contrast, because there is relatively little skill involved in offending, the amount of time spent pursuing offending opportunities will (a) be shorter and (b) more rewarding. A graphical representation of the indifference curves of individuals with symptoms of psychopathy and individuals without any or only a few symptoms of psychopathy is shown in Figure 3.3. Panel A of Figure 3.3 shows the expected possibilities of legitimate (X axis) and illegitimate (Y axis) behaviors for an individual with symptoms of psychopathy. Three indifference curves show that the optimal decision emphasizes the pursuit of illegitimate opportunities over legitimate ones (see A^*). Panel B of Figure 3.3 shows the change in preference for legitimate versus illegitimate behaviors that is necessary for desistance. With the indifference curves remaining the same, for this offender to show a preference for legitimate versus illegitimate behavior, they would have to re-locate a substantial amount of time to legitimate opportunities (see A^*). Moreover, because the indifference curve is the one closest to the origin of the graph, it is the least preferred curve.

PANEL A

X_2
B/P_2
A^*
X^*_2
X^*_1 B/P_1 X_1

PANEL B

X_2
B/P_2
X^*_2 A^*
X^*_1 B/P_1 X_1
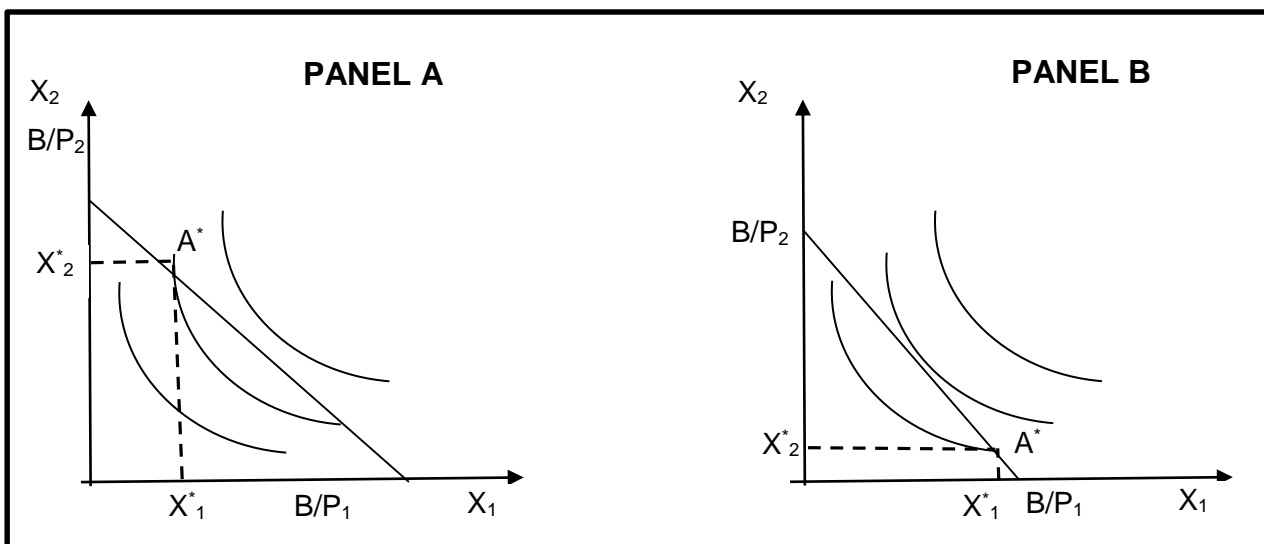
Figure 3.3: The rational choice decision to desist for offenders with symptoms of psychopathy

3.5.3.   The Life Course Perspective

Although there are several life course theories (e.g., Elder, 1994; Giordano, Cernkovich, & Rudolph, 2002; Uggen, 2000; Warr, 1998), arguably Laub and Sampson's (2001) is the most comprehensive and well-validated in terms of explaining desistance. From their perspective, regardless of early child development, the transition from adolescence to adulthood provides access to roles that discourage involvement in offending (Laub & Sampson, 2003). In contrast to the maturation hypothesis, it is not the biological effects of aging, nor is it solely age-related changes in identity, but rather the acquisition of new social roles and informal social controls, which may be related to identity changes, but may also simply be random opportunities (Laub & Sampson, 2003), that influence desistance. As offenders enter adulthood, the acquisition of positive social roles increases the stakes that come with involvement in offending. These social roles, such as marriage, also reduce an individual's level of unstructured time (Warr, 1998).

Often referred to as turning points, or events that alter an individual's offending trajectory, marriage, parenthood, and employment are three adult roles that Laub and Sampson (2001) assert represent powerful informal social controls. Turning points impact the desistance process by influencing an offender's will to avoid jeopardizing their new social roles (Mulvey et al., 2004). As such, it is not simply the offender's willingness to

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change their behavior to shape their new identity; it is also the offender's desire to behave in a manner that will not threaten their bonds to others or to their job. These turning points not only increase stake-in-conformity, they also alter routine activities and limit exposure to offending opportunities. For example, offenders spend less time with antisocial peers after marriage (Warr, 1998). Life course theorists also note that it is not solely whether a turning point occurs or does not occur. Also important to the promotion of desistance is the timing of the event, the quality of the event or its importance to the offender, and the stability of the turning point (Kazemian & Maruna, 2009). If a turning point such as employment, marriage, or parenthood occurs prior to the offender reaching a level of maturity or self-identity transformation that makes them receptive to change, then it is unlikely that such an event will contribute to desistance. For example, as illustrated by Uggen (2000), offenders benefited from the informal social control effects of employment only after the age of 26. The implication of this finding was that employment is not valued in the same way at earlier development stages.

Psychopathy and the Life Course Perspective

Sweeten, Piquero, and Steinberg (2013) asserted that for more serious offenders, marriage may have a lesser impact on desistance compared to less serious offenders. The natural progression from this assertion is to begin to understand *why* serious offenders do not benefit from forms of informal social control such as marriage. Symptoms of psychopathy may affect the extent to which an offender experiences informal social controls, benefits or appreciates these turning points, or is able to maintain a turning point for a sufficient period of time. There is at least some indirect evidence that symptoms of psychopathy will act as a barrier to desistance. Cernkovich and Giordano (2001) demonstrated that social bonding mechanisms promoted desistance for general samples, but for offender samples, where symptoms of psychopathy will be more prevalent, these mechanisms were not effective in reducing offending. At least conceptually, prototypical symptoms of psychopathy should decrease the likelihood that the mechanisms of informal social controls will promote desistance. For example, individuals that lack concentration, perseverance, and long-term goals should be unlikely to find, appreciate, or maintain employment. Similarly, considering two other important sources of informal social control specified by Laub and Sampson (2001), factors such as being uncaring, detached, uncommitted, self-centered, self-entitled, self-justifying, and being disinterest in

maintaining intimate relationships and friendships imply that individuals with symptoms of psychopathy will not benefit from marriage or parenthood and will not maintain these relationships over time. Indeed, whether it be employment, marriage, or parenthood, maintaining these sources of informal social control require commitment, caring, empathy, prosocial happiness, and loyalty, all of which are typically lacking amongst individuals with symptoms of psychopathy (Cooke et al., 2004; Kreis et al., 2012).

3.5.4. The Developmental Perspective

Similar to life course theorists (Laub & Sampson, 2001) and proponents of human agency (e.g., Maruna, 2001), developmentalists assert that desistance is best described as a process, with offending termination being the outcome of desistance (Bushway et al., 2001). Life course theorists and developmentalists also agree that turning points and within-individual change are important factors to consider regarding the desistance process. Where these two perspectives begin to diverge is with respect to (a) how offending unfolds over time, (b) the importance of childhood and adolescent experiences on adult offending outcomes, and (c) the validity of mono-causal theories of desistance (Blokland et al., 2005). Beginning with the specification of the unfolding of offending, developmentalists (e.g., Le Blanc & Loeber, 1998; Loeber & Le Blanc, 1990) are much more descriptive in terms of specifying the dynamic nature of offending over time. Le Blanc and Loeber (1998) specified three stages of offending across the life course, and at each stage, the nature of offending involvement changes. At the first stage, activation, offending becomes more frequent, more versatile, and more stable. At the second stage, aggravation, the types of offenses committed are more severe, and this escalation is typically characterized by involvement in qualitatively similar offense types (e.g., overt or covert; see Loeber & Hay, 1994). Finally, at the third stage, desistance, offending becomes less frequent, more specialized, and less serious. The timing (e.g., when the stage happens) and duration (e.g., how long an individual spends in a stage) of these stages is thought to be influenced by different risk factors.

Developmentalists also argue that childhood and adolescent experiences and risk factors affect (a) the likelihood of experiencing quality turning points in adulthood, or (b) the capacity to benefit from turning points that do occur (Moffitt, 1993), which is very much

in contrast with life course theories of desistance (Laub & Sampson, 2001; Sampson & Laub, 2003). Although the search for specific risk factors affecting the occurrence of turning points has been rather unsuccessful (e.g., Sampson & Laub, 2003; van der Geest et al., 2009), there is evidence that the occurrence or beneficial effect of key turning points varies across different offending trajectories. In their analysis of offenders from the Netherlands, Blokland and Nieuwbeerta (2005) found that turning points had only a modest effect on desistance for the most frequent offenders. Similarly, using a sample of Dutch adolescent offenders followed into their thirties, van der Geest, Bijleveld, and Blokland (2011) found that (a) higher-rate offenders were less likely to be employed and (b) these higher-rate offenders had fewer employable qualities. In other words, due to selection effects, certain offenders were less likely to experience or benefit from employment. This is very much in contrast with Laub and Sampson's (2001) perspective that selection effects were inconsistent with the randomness of life events and notions of human agency. Symptoms of psychopathy may be a potential source of selection effects.

Finally, developmentalists and life course researchers disagree with respect to concepts of asymmetrical causation and mono-causality (Blokland et al., 2005). For developmentalists, factors influencing onset, persistence, and desistance may all be different. For life course theorists, these elements of the criminal career can be explain by the presence or absence of the same factors (e.g., sources of informal social control). Relatedly, life course theorists oppose the notion that type of factor influencing desistance for one type of offender may be different from the type of factor influencing desistance for another type of offender (Blokland et al., 2005)[17]. For developmentalists like Moffitt (1993), in contrast to mono-causal theories, risk factors for adolescence-limited (AL) offenders were different from the risk factors for life course persistent (LCP) offenders. As well, for AL offenders, social learning processes were implied in the onset of offending but acquisition of informal social controls were implied in the lead-up to desistance. Also unlike the life course perspective and other desistance theories, the developmental perspective is less a specific theory of desistance and more a framework for incorporating the appropriate desistance theory. Different desistance theories may be more or less

[17] This is not to say that life course theorists reject the notion of age-graded informal social controls. The *nature* of the informal social control influencing desistance may vary over time, but the source of desistance is always the same (i.e., informal social control).

appropriate depending on the offender and their associated developmental pathway. Examining symptoms of psychopathy may be helpful for identifying the likelihood that an offender will follow a specific developmental pathway, and therefore the appropriate approach to the promotion of desistance for this type of offender.

Psychopathy and the Developmental Perspective

Of the desistance theories reviewed, only the developmental perspective specifically incorporates the psychopathy construct. Although not specifically referred to by Moffitt (1993) in her discussion of the role of neuropsychological deficits for life course persistent offending, psychopathy appears to be in line with her description of risk factors that mortgage an offender's future. Unlike other risk factors that influence offending during adolescence but become only distally related to offending over time (e.g., abuse, residential instability, poor parental attachment; Chung, Hill, Hawkins, Gilchrist, & Nagin, 2002; Day et al., 2012; Losel & Bender, 2003), symptoms of psychopathy are relatively stable (Lynam et al., 2007). Due to this stability psychopathy should (a) have more proximal effects on offending behavior across the life course and (b) continue to represent a barrier to desistance during age-periods where offenders are expected to bridge the maturity gap. Although Moffitt (1993) did not specifically refer to psychopathy, others influenced by Moffitt (e.g., Lalumière, Quinsey, Harris, & Rice, 2005) have contrasted the stable nature of psychopathy with the transitory nature of young male syndrome (YMS). The latter construct was specified by Moffitt (1993) to be responsible for adolescence-limited (AL) offending. Thus, the two constructs are expected to differentially impact criminal careers, but at the same time, manifestations of YMS can look very similar to manifestations of psychopathy. Differentiating between the two constructs is necessary to better understand which offenders will desist as a result of typical desistance theories (YMS) and which offenders are at risk of 'selecting' into an offending trajectory where turning points are less likely to occur (e.g., van der Geest et al., 2011).

Wilson and Daly (1985) initially characterized individuals with YMS as aggressive, impulsive, and risk taking. Expanding on this notion, Seto and Barbaree (1997) described how the impulsivity of individuals with YMS allowed this type of offender to be opportunistic. Although specifically talking about sexual offenses, Seto and Barbaree (1997) described how the aggressiveness of the YMS offender facilitated the use of

coercive tactics to accomplish goals. Lalumière et al. (2005) described these individuals as domineering, fearless, and willing to use coercion to capitalize on opportunities. This impulsive, aggressive, and dominating nature is similar to prototypical symptoms of the psychopathy construct (Kreis et al., 2012). However, whereas psychopathy is believed to be a stable personality disorder, qualities associated with YMS are expected to dissipate over time (Wilson & Daly, 1985) and thus offending is confined to the period of adulthood. Once exiting the stage of adolescence, YMS offenders are expected to, as Moffitt (1993) put it, bridge the maturity gap. The traits characterizing YMS are socially-induced via expectations of male daringness and willingness to compete for resources (Wilson & Daly, 1985), which is very much in contrast with perspectives on the development of psychopathy (Ogloff, 2006).

Lalumière et al. (2005) expanded on Seto and Barbaree's (1997) model by explicitly clarifying the distinction between YMS and psychopathy. Unlike the hypothesized origins of psychopathy, where symptoms can be observed at the beginning of childhood (Barry et al., 2008; Hawes & Dadds, 2007; Obradovic, Pardini, Long, & Loeber, 2007), Lalumière et al. (2005) specified that YMS characteristics emerged during adolescence only. For these offenders, classic turning points such as marriage and job opportunities were expected to increase the costs of coercive tactics, resulting in desistance. Similarly, Moffitt (1993) argued that these offenders would desist once they were able to bridge the maturity gap between adolescence and adulthood. For individuals with symptoms of psychopathy, however, Lalumière et al. (2005) speculated that coercive tactics would be part of a life-long strategy used for obtaining gratification (sexual or otherwise). In addition to coercive tactics, methods such as manipulation, insincerity, and deceit were expected to be part of this life-long strategy. Due to the expectation that this strategy would continue across the life course, Lalumière et al. (2005) did not expect individuals with symptoms of psychopathy to desist from offending unless the individual identified ways to manipulate others in a non-criminal way. In sum, the YMS-type offender is not necessarily a poorer judge of risk and consequences compared to adults; rather, it is at this stage that risk-taking is socially validated (Reyna & Farley, 2006; Steinberg, 2008). However, for offenders with strong symptoms of psychopathy, the driving force behind their behavior is not normative development combined with social expectation; rather, the symptoms themselves drive involvement in criminal activity. Although it is unclear whether this is an

evolutionary adaptation on the part of the individual with symptoms of psychopathy (Lalumière, Mishra, Harris, & Duntley, 2008), the expected antisocial behavior manifestations of the individual with symptoms of psychopathy are expected to continue across the life course and be resistant to normative developmental processes initiating change.

Due to similarities between symptoms of psychopathy and symptoms of YMS, it is important to be measuring the full range of symptoms of psychopathy, something that criminologists have rarely done (Corrado et al., 2015). As well, because of similarities in symptom profiles, it is also possible that the two groups will show similar offending patterns during the period of adolescence. In line with Cullen's (2011) recommendations for the future of criminology, it is necessary to move beyond measures of offending in adolescence in order to distinguish barriers to desistance between those characterized by YMS and those characterized by symptoms of psychopathy. The first study in this dissertation (Chapter Five) begins to address this concern. The specific aims of this study are described below.

Chapter 4.

Outline of Three Studies on Psychopathy and Offending Trajectories

Whether symptoms of psychopathy appear to act as a barrier to desistance will be examined in three different studies. Each of the three studies addresses the relationship between psychopathy and one of three different types of offending trajectories: general offending, serious offending, and violent offending. The three studies are divided into three chapters. Although each study utilizes the same dataset, the methodology section is repeated in each chapter as specific measures differ between the three studies. Study One (Chapter Five) addresses the overall failure of criminal career and developmental and life course research to include the psychopathy construct in the examination of offending trajectories. Prior trajectory research and its failure to include measures of psychopathy is discussed. Part of this discussion includes an explication of conceptual issues with prior trajectory research and how these conceptual issues at least partially explain the noted absence of research on psychopathy and criminal careers. In this study, scores on the PCL:YV were compared between individuals following chronic offending trajectories and individuals associated with a trajectory characterized by desistance during emerging adulthood.

Study Two (Chapter Six) builds off of key results presented in Chapter Five by examining the relationship between psychopathy and time incarcerated. This study represents a change in the typical analytic approach used in the majority of previous studies of offending trajectories (see Piquero, 2008). By using incarceration time as the dependent variable modeled in the trajectory analysis, as opposed to the variable being controlled for, concerns about accounting for exposure time in Proc TRAJ for SAS (see Blokland et al., 2005; Cale et al., 2015; van der Geest et al., 2009) are addressed. Using the same data as in Chapter Five the number of months incarcerated per person-period observation is modeled using SPGM. It is assumed that both the most prolific or most serious offenders would be characterized by trajectories associated with the highest levels of incarceration from age 12 through age 28. Given the expectation that this trajectory will capture both serious and frequent offenders, it is expected that higher PCL:YV scores will

be informative of membership in this trajectory. The study is also expected to be informative of 'false desistance' by examining the relationship between an individual's association with a 'high-rate' incarceration trajectory despite also being associated with lower levels of general offending.

Study Three (Chapter Seven) explores the relationship between symptoms of psychopathy and involvement in trajectories characterized by persistent involvement in violent offending. Retrospective and prospective longitudinal data from a sample of Canadian male ($n = 262$) and female ($n = 64$) adolescent offenders incarcerated between 1998 and 2001 are used to model joint trajectories of violent and non-violent offending. The use of an offender-based sample meant that the data accounted for the full range of violent offending involvement (e.g., from the one-time offender to the recidivist to the persistently violent offender) and the full range of symptoms of psychopathy. Symptoms of psychopathy are again measured using the Psychopathy Checklist: Youth Version (PCL:YV) to help explain an offender's association with joint trajectories of violent and non-violent offending. The aim of this study is to bring together one of the most important risk factors for violence according to the risk assessment literature (i.e., psychopathy), and one of the most comprehensive measures of an individual's criminal career (i.e., measures of offending trajectories).

Chapter 5.

Study One: Desistance Trajectories for General Offending

5.1. Introduction

Interest in the longitudinal development of offending patterns emerged as early as the 1930s at the case-study level with classic works such as Shaw's (1930) *The Jack Roller*. The primary contribution of the 1986 National Academy of Sciences report was to move beyond descriptions of offending patterns at the case-study level and instead toward the specification of measurable parameters of an offender's criminal career, now known as the criminal career paradigm (Blumstein, Cohen, Roth, & Visher, 1986). Rather than simply differentiating offenders from non-offenders, the criminal career paradigm also seeks to describe sequences of offending over time within offenders and between offenders. This sequence is described by different 'parameters' detailing the beginning (e.g., age of onset), middle (e.g., changes in frequency, severity, and crime type), and end (e.g., desistance) of an offender's criminal career (Loeber & Le Blanc, 1998). Emphasis within Chapter Five is on (1) the importance of offending trajectories to research on criminal careers, (2) conceptual challenges within the extant trajectory research, (3) the measurement of psychopathy, and (4) the manner in which psychopathy is expected to act as a barrier to desistance.

The term 'trajectory' in the criminal career context refers to the encapsulation of an individual's offending pattern from beginning to end, essentially capturing several of the abovementioned criminal career parameters in a single analysis (Nagin, 2005). In effect, a trajectory is the pattern and sequence of an outcome over age or time and can be used to explain the evolution of crime across the life course (Nagin, 2005; Nagin & Tremblay, 2005). Several studies in criminology indicate that a small percentage (5-10%) of offenders are responsible for the majority of all crimes committed (e.g., Wolfgang et al., 1972). Trajectory research is helpful in identifying the offending patterns of this group as well as risk factors that increase the likelihood of being a chronic offender (Piquero, 2008).

Measurement of trajectories requires a longitudinal research design involving repeat-measures of crime frequency (either self-report or official criminal records) at each age over a lengthy period of time (Piquero, 2008). This approach is different from recidivism-based approaches to studying offending outcomes. This approach relies on shorter follow-up periods to assess offending outcomes, involves only measuring the 'next offense', and captures only a narrow aspect of an offender's criminal career (Lussier, McCuish, & Corrado, 2015). For example, some offenders recidivate as part of a desistance process whereas others recidivate as part of an increasingly more serious offending pattern. The trajectory approach better accounts for the heterogeneity of offending patterns across individuals by capturing broader criminal career patterns (Lussier, McCuish, & Corrado, 2015).

Nagin and Land (1993) developed semi-parametric group-based modeling (SPGM) as an analytic technique that could be used to examine whether underlying risk factors associated with offenders in chronic offending trajectories could be distinguished from those of offenders associated with desistance trajectories[18]. However, identifying these risk factors has remained elusive in criminal trajectory studies (see Piquero, 2008 for a review). This is despite a number of developmental life course studies arguing that etiological differences exist between these two groups (e.g., Le Blanc & Loeber, 1998; Moffitt, 1993; Patterson, Debaryshe, & Ramsey, 1989; Thornberry, 2004). This issue has likely persisted because of three unaddressed conceptual challenges associated with trajectory research. First, insufficient base rates of chronic offenders have made detecting significant differences between chronic offenders and desisters difficult (van Domburgh, Vermeiren, Blokland, & Doreleijers, 2009). Second, detecting such differences has remained challenging because many studies have not included important neuropsychological deficits that have been hypothesized to differentiate chronic offenders and desisters (see van der Geest, Blokland, & Bijleveld, 2009). Third, many criminogenic factors measured in adolescence are only distally related to adult offending outcomes (Chung et al., 2002) and thus risk factors that are stable across the life course should be utilized in trajectory studies.

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[18] A desistance trajectory implies that the offender was involved in some non-zero level of offending over the life course, and differs from non-offenders and non-recidivists (Lussier, McCuish, & Corrado, 2015).

5.1.1. Trajectory Research and the Developmental Life Course Perspective

The trajectory methodology is consistent with person-oriented methodological approaches (Magnusson & Bergman, 1988). The person-oriented approach focuses on persons rather than variables to facilitate the simultaneous examination of within-individual and between-group differences in offending over time (Lussier & Davies, 2011; Magnusson & Bergman, 1988; Moffitt, 1993). The developmental and life course (DLC) perspective aims to explain the evolution of crime and deviance at the individual level from childhood to adulthood by considering how life conditions and other risk factors can influence offending onset, persistence, and desistance (Farrington, 2005; Loeber & Le Blanc, 1990; Nagin & Paternoster, 2000). Trajectory research can help provide a framework for addressing these core DLC aims. Although some have critiqued the SPGM method on the basis of its ability to test taxonomic and other theories (e.g., Skardhamar, 2009; 2010), others have noted that this has never been the purpose of the SPGM approach (Brame, Paternoster, & Piquero, 2012). The meaningfulness of groups is determined by the theory used to interpret the groups, not by the statistical method. If the groups are as predicted by a theory, then that is support for the theory (Brame et al., 2012). A more general critique of trajectory studies relates to the need for research to measure early neuropsychological deficits in offender samples and then track the development of the criminal trajectories of these offenders into adulthood (see Blokland, Nagin, & Nieuwbeerta, 2005; van der Geest et al., 2009; van Domburgh et al., 2009; Fergusson, Horwood, & Nagin, 2000).

In prior trajectory studies, use of the person-oriented approach to examine within-individual differences in offending over time has revealed that the number of unique offending trajectories representing incarcerated samples typically ranges from four to six. Of these trajectories, there is almost always at least one chronic trajectory and one adolescent-limited trajectory (Jennings & Reingle, 2012; Piquero, 2008). Although etiological differences between chronic and adolescent-limited offenders have long been hypothesized (e.g., Le Blanc & Frechette, 1989; Moffitt, 1993), studies that have compared chronic offending trajectories to adolescent-limited and other trajectories associated with desistance have had difficulty identifying developmental risk factors that distinguish these groups (e.g., Day et al., 2012; Fergusson et al., 2000; Landsheer & van Dijkum, 2005;

Nagin, Farrington, & Moffitt, 2005; Odgers et al., 2008; Piquero, 2008; Sampson & Laub, 2003, 2005b).

5.1.2. Conceptual Challenges within the Extant Empirical Research on Offending Trajectories

There are at least three conceptual challenges associated with attempts to identify risk factor differences between chronic offenders and non-chronic offenders. These conceptual issues are related to (1) sample selection, (2) inclusion of appropriate risk factors, and (3) the search for risk factors that are also stable over time. Regarding sample selection, van Domburgh et al. (2009) explained that comparisons between chronic and desisting trajectories often failed to identify differences in risk factor profiles because of an insufficient base rate of offenders following this high-rate and persistent offending trajectory (also see Bushway, 2013). In other words, the base rates needed to perform the appropriate statistical analyses for comparing between trajectory groups (see Copas & Tarling, 1986; MacLennan, 1988) has been lacking in this prior work. In effect, the theoretical relevance of studies that found no differences between chronic and desisting trajectories, but relied on low-risk, population-based samples, is limited (see van der Geest et al., 2009). Sampling directly from populations of known offenders is needed to obtain adequate base rates (Blokland & Nieuwbeerta, 2005; Blokland et al., 2005; Piquero; 2008; van der Geest et al., 2009; van Domburgh et al., 2009).

Regarding the second conceptual issue, most prior studies have not included the types of neuropsychological measures thought to differentiate offenders following chronic trajectories versus trajectories characterized by desistance. Instead, predictors of offending trajectories have included parental divorce, religious involvement, school performance and IQ, impulsivity, poor concentration, early onset of antisocial behavior, criminal record of parents/siblings, and parenting style (e.g., Blokland et al., 2005; Day et al., 2012; Fergusson et al., 2000; Landsheer & van Dijkum, 2005; Nagin et al., 2005; Odgers et al., 2008; van der Geest et al., 2009; van Domburgh et al., 2009; Ward et al., 2010). In other words, the types of variables included were those that were not deemed sufficient in early theorizing regarding the relationship between chronic offenders and offenders following a desistance trajectory. Overall, the research lacked incorporation of

risk factors thought to be unique to chronic offending and instead included risk factors typically used to distinguish offenders from non-offenders. Indeed, even certain neuropsychological deficits such as ADHD, conduct disorder (CD), and other behavioral or attention disorders cannot be reasonably expected to differentiate types of offending trajectories because such disorders are prevalent among adjudicated[19] adolescent offenders (Forth, 1995) and are rather unhelpful in predicting future offending (e.g., Gretton, Hare, & Catchpole, 2004). This limitation can be rectified by including the types of psychopathological disorders that are predominant within chronic offenders but not low/moderate offenders (e.g., Odgers et al., 2008).

Regarding the third conceptual issue, many childhood or adolescent risk factors associated with offending in adolescence will have only a distal effect on offending in adulthood. As such, desistance is expected even if these risk factors are reported in the offender's history. This is because the strength of the relationship between risk factor and offending tends to decrease over time; the risk factor does not follow the individual in lock-step (Chung et al., 2002; Losel & Bender, 2003). Traditional criminogenic risk factors over time become only distally related to offending. For example, poor parental attachment and other family adversities have less of an effect on adults because adults are not as reliant on their parents as children or adolescents (e.g., Chung et al., 2002). Thus, studies that attempt to identify characteristics of individuals that are specific to certain offending trajectories would benefit from the incorporation of risk factors that are measured in adolescence and remain relatively stable across time.

One such risk factor is psychopathy, which is known to be at least moderately stable over the life course (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Vachon, Lynam, Loeber, & Stouthamer-Loeber, 2012) and is also the type of developmental risk factor hypothesized to distinguish chronic offenders from those that desist in early adulthood (Dyck, Campbell, Schmidt, & Wershler, 2013; Frick, 2009; Moffitt, 1993, 2006). Psychopathy is a personality disorder that is characterized by deficits in interpersonal, affective, and behavioral domains (Cleckley, 1976). Together, these deficits

[19] The term 'adjudicated' is used to differentiate between the vast majority of adolescents who commit *some* criminal offense that may or may not be detected (Le Blanc & Frechette, 1989) and those adolescents whose offense was serious enough to warrant criminal justice involvement.

create a grandiose and manipulative interpersonal style that is uninhibited due to an orientation towards impulsive and risk-taking behaviors and an unempathic, uncaring, and uncommitted disposition (Lynam, 1996). The clustering of these symptoms, at least theoretically, would act as a barrier to desistance.

Initial studies in criminology, although not necessarily explicitly referring to psychopathy, indicated that this construct may be influencing early-onset antisocial behavior and persistent criminal behavior. Patterson and colleagues (1989, 1998), for example, asserted that early antisocial behavior was a developmental trait that was expressed in different forms at subsequent stages throughout the life course, including chronic offending by age 18. Similarly, Moffitt (1993) and Loeber and Stouthamer-Loeber (1998) labeled individuals associated with this early onset pathway of serious antisocial behavior and subsequent long term offending as life-course persistent (LCP) offenders. LCP offenders were thought to represent a small group of chronic offenders, roughly less than ten percent of the population, that Wolfgang, Figlio, and Sellin (1972) identified as being responsible for the majority of all crime (also see, DeLisi, 2005; Jennings & Reingle, 2012; Vaughn et al., 2011). Moffitt and Caspi (2001) identified the combination of parenting, neurocognitive functioning, and very early child temperament and behavioral problems as key correlates of the LCP antisocial behavior subtype. Early examinations of data from the Gluecks' classic Unraveling Juvenile Delinquency study also found a relationship between childhood temperament and adult offending outcomes (Sampson & Laub, 1994). As well, although not finding the same early childhood-based temperament risk factors, Aguilar, Stroufe, Egeland, and Carlson (2000) identified high stress single parent families, an early childhood avoidant attachment style, and childhood abuse, including neglect or other forms of inadequate parenting as correlate of this LCP sub-type.

Most explicitly, Vaughn and DeLisi (2008) asserted that the small number of chronic offenders and the small number of individuals with the strongest symptoms of psychopathic personality disturbance (PPD) was not coincidental. Rather, the two groups were actually comprised of the same individuals. Similarly, Lochman, Powell, Boxmeyer, Young, and Baden (2010) argued that the identification of high-risk subtypes among children and adolescents, historically, was a critical initial step in eventually relating child and adolescent manifestations of psychopathy to long-term criminal trajectories. Despite

the hypothesized importance of psychopathy, this initial phase of research lacked the inclusion of a validated youth psychopathy instrument that could be used to help explain association with a criminal trajectory extending into adulthood. Although this is clearly an important line of analysis, the application of the psychopathy construct to adolescents is somewhat contentious and is addressed below.

5.1.3. Extending the Psychopathy Construct to Childhood and Adolescent Developmental Stages

Perhaps the biggest issue facing the extension of the adult psychopathy construct to youth is determining the manner in which symptoms of psychopathy are expressed during this developmental stage. A challenge for the development of measurement tools included addressing whether symptoms of psychopathy manifested in the same way across different developmental stages (i.e., heterotypic continuity). For this reason, tools developed specifically to measure symptoms of psychopathy in adulthood were thought to be inappropriate to generalize to adolescents. For example, failure to maintain stable employment may be an indicator used to rate symptoms of psychopathy in adulthood, but lack of stable employment is a normative feature of adolescence. Similarly, impulsivity in adulthood is an indicator of psychopathy, yet some level of impulsivity in adolescence is expected. In effect, these two issues relate to (a) concerns about differences in *type* of symptom and (b) concerns about differences in *level* of symptom. Until the turn of the 21st century there was no validated measure of psychopathy to apply to adolescents. As such, it is at least partially understandable why there has been such a serious lack of research concerning the prediction of offending trajectories based on adolescent measures of symptoms of psychopathy.

An important thematic change in measurement occurred that facilitated the abovementioned line of empirical inquiry. This change involved the downward extension of the PCL-R to develop the PCL:YV (Forth et al., 2003) expert rating scale along with the self-administered (e.g., the subject or their parents and/or teachers) child and adolescent psychopathy screening instruments such as the Child Psychopathy Scale (CPS; Lyman, 1997), the Antisocial Process Screening Device (Frick & Hare, 2001), the Youth Psychopathy Traits Inventory (YPI; Andershed, Gustafson, Kerr, & Stattin, 2002), and the

Psychopathy Content Scale (PCS; Murrie & Cornell, 2000). As expected, given intense and controversial debate about various validity issues concerning the use of the PCL for adults, especially concerning predictive validity (e.g., tautological concerns regarding the predominance of antisocial behavior items with recidivism; Skeem and Cooke, 2010) and the theoretically justifiable number and labeling of the PCL-R's factor/facet structure (Cooke & Michie, 2001; Hare & Neumann, 2005), the use of the PCL:YV as well as other instruments raised ethical concerns regarding the labeling of children and adolescents. Such stigmatization may actually result in continued or even increased involvement in offending (Edens et al., 2001). A second ethical concern related to the premature use of the psychopathy construct in risk prediction instruments in juvenile/youth justice settings and in sentencing and treatment planning (e.g., Edens et al., 2001; Salekin, Rosenbaum, Lee, & Lester, 2009). In addition, there have been internal validity concerns about the self-reported scoring of instrument items, particularly by children and adolescents about themselves. A related issue involves the appropriateness of using self-administered instruments in general and community samples of children and youth versus structured instruments for clinical and custodial samples (see Kotler and McMahon (2010) for a comparison of all these instruments and Salekin and Lynam (2010) for broader discussion of these validity issues).

One reason to believe that symptoms of psychopathy can be reliably measured in adolescence is related to the observed stability of symptoms over time. Several longitudinal research studies have reported moderate stability for these traits across the major developmental stages into early adulthood (e.g. Barry, Barry, Deming, & Lochman, 2008; Dadds, Fraser, Frost, & Hawes, 2005; Frick, Kimonis, Dandreaux, & Farell, 2003; Loney, Taylor, Butler, & Iacono, 2007; Lynam et al., 2007; Obradović, Pardini, Long, & Loeber, 2007; Pardini & Loeber, 2008). Lynam and colleagues (2007), for example, assessed psychopathic traits in a community sample, first at age 13 (using the Child Psychopathy Scale) and, subsequently, at age 24 (using the Psychopathy Checklist: Screening Version) and found moderate stability ($r = .31$). In a follow up study, Lynam, Loeber, and Stouthamer-Loeber (2008) found that early psychopathy scores were consistently predictive of adult psychopathy scores whereas traditional risk factors (e.g., socioeconomic status, parenting styles, impulsivity, peer delinquency, verbal intelligence, previous delinquency) were not. Frick et al.'s (2003) earlier research reported moderately

strong levels of stability of psychopathic traits within the middle childhood stage (grades three to six). Obradović and colleagues (2007) also found moderate stability for interpersonal and callous traits over eight years between childhood and adolescence. Pardini and Loeber (2008) reported that adolescent interpersonal and callous traits predicted antisocial personality at age 26. Similarly, Blonigen, Hicks, Krueger, Patrick, and Iacono (2006) confirmed that the core traits of psychopathy (fearless-dominance, or interpersonal/affective traits) exhibited stability between late adolescence and early adulthood.

In terms of different measurement tools in adolescence, the PCL:YV is considered the gold standard; it has a high degree of reliability and validity and its twenty items are considered appropriate indicators of symptoms of psychopathy in adolescence (Edens & Campbell, 2007; Edens, Skeem, Cruise, & Cauffman, 2001). The twenty items of the PCL:YV have been separated into different factor structures. Most studies support either a parceled four-factor model (Forth et al., 2003) or a three-factor model (Cooke & Michie, 2001). The four-factor model includes an interpersonal facet (items: glibness, grandiosity, pathological lying, manipulative), an affective facet (items: lacks remorse, shallow affect, lacks empathy, failure to accept responsibility), a lifestyle facet (items: boredom, impulsivity, irresponsibility, parasitic orientation, lacks realistic goals), and an antisocial facet (items: poor anger control, early behavioral problems, juvenile delinquency, revocation of conditional release, criminal versatility). The three-factor model simply excludes the antisocial facet, based on concerns surrounding the use of prior criminal behavior to predict future criminal behavior (Cooke & Michie, 2001). Studies using the PCL:YV or other measures of psychopathy have indicated that features of adolescent psychopathy are reliably measured across different populations (e.g., community and incarcerated samples), different ethnicities, and gender (Pechorro et al., 2013; Schmidt, McKinnon, Chattha, & Brownlee, 2006; Stockdale, Olver, & Wong, 2010; Vachon et al., 2012). These reliability studies that have increased the nomological net of the PCL:YV have helped justify its use as a predictor of offending among adolescents.

5.1.4. Psychopathic Personality Disturbance and Offending Outcomes

Psychopathy has been identified as one of the strongest individual-level predictors of general offending, time until recidivism, early onset of offending, persistent offending, and criminal career index measures (Corrado, Vincent, Hart, & Cohen, 2004; DeLisi, Angton et al., 2014; DeLisi, Peters, et al., 2014; Gretton et al., 2004; Hare, 1996; Hare, 2001; Salekin, 2008; Vaughn & DeLisi, 2008; Vaughn, Howard, & DeLisi, 2008; Vincent, Odgers, McCormick, & Corrado, 2008). The robustness of psychopathy as a predictor of these different offending outcomes has been demonstrated in previous research by comparing the predictive validity of measures of psychopathy and other criminogenic factors. Flexon and Meldrum's (2013) study of a community sample of adolescents found that scores on a measure of callous-unemotional traits were significantly and substantively predictive of violent behavior even when controlling for traditional criminogenic variables, including low self-control and delinquent peers. In another study, DeLisi, Peters, et al. (2014) found that adolescents with high levels of psychopathy had an earlier onset of offending that was not mediated by moral disengagement. Most of these studies; however, have been confined to recidivism outcomes during the period of adolescence (see Edens & Cahill, 2007; Leistico, Salekin, DeCoster, & Rogers, 2008; Salekin, 2008). In effect, these studies were uninformative of desistance in adulthood, especially when defining desistance as a process. However, there are a small number of studies involving the use of psychopathy measures to predict criminal recidivism over the long-term.

Based on a ten-year follow-up period of 133 youth referred for a court-ordered mental health assessment, Schmidt, Campbell, and Houlding (2011) found that PCL:YV scores were more strongly associated with general recidivism and technical violations compared to those of the Youth Level of Service/Case Management Inventory (YLS/CMI) and the Structured Assessment of Violence Risk in Youth (SAVRY). Schmidt et al. (2011) also found that PCL:YV scores were more strongly associated with violent recidivism compared to YLS/CMI scores. In effect, relative to the YLS/CMI, PCL:YV scores might better capture individual differences in persistent juvenile offending. These findings are interesting given that the YLS/CMI requires risk assessors to consider the presence of psychopathic traits (e.g., Hoge, 2012). In line with Robins' (2005) perspective, the YLS/CMI might include factors irrelevant to the prediction of reoffending, which has the

effect of diluting the overall predictive validity of the scale/instrument. Although Welsh, Schmidt, McKinnon, Chattha, and Meyers (2008) used the same sample described in Schmidt et al. (2011), they found that over a three year period the SAVRY outperformed the PCL:YV's ability to predict violence. In contrast, Schmidt et al.'s (2011) found in their ten year follow-up that neither the PCL:YV nor the SAVRY showed incremental predictive validity over the other instrument in terms of prediction of violent recidivism. However, the PCL:YV was the stronger predictor of general recidivism and showed improved incremental validity over the SAVRY in prediction of non-violent recidivism.

The disparate findings between these two studies may be related to the SAVRY being a stronger predictor of offending outcomes in the short term whereas the PCL:YV is a stronger predictor of violence over the long term. This latter explanation is in line with symptoms of psychopathy being stable over time (e.g., Lynam et al., 2007; Vachon et al., 2012) and therefore likely to act as a more important proximal risk factor (e.g., Chung et al., 2002). However, despite the long-term follow-up periods, these studies focused solely on measures of recidivism as opposed to examining the relationship between psychopathy and criminal career parameters. Of all research on offending, until more recently, criminal career research has likely given the least amount of empirical attention to the psychopathy construct.

5.1.5.   Psychopathy and the Criminal Career Perspective

Despite Farrington's (2005) call ten years ago for more systematic attempts at integrating psychopathy into criminological theories, the psychopathy construct has only recently been incorporated within the criminal career perspective. In their review of recent criminal career research, DeLisi and Piquero (2011) emphasized that criminal career measures can be linked to biosocial development, including personality disorders and psychopathy in particular. Moreover, DeLisi and Piquero (2011) speculated that because the size of the population of individuals with psychopathy mirrored the population of individuals who were the most chronic offenders, it was possible that these two groups were comprised of more or less the same individuals (also see Vaughn & DeLisi, 2008). However, few studies have actually examined the relationship between psychopathy and offending from adolescence to adulthood, and as such whether chronic offenders present

a clinical profile suggestive of the presence of psychopathic traits or psychopathy is unclear.

Dyck and colleagues (2013) measured symptoms of psychopathy in adolescence and examined offending frequency from age 12 to 23 in a sample of male (n = 80) and female (n = 46) adolescent offenders. Adolescents with moderate or high symptoms of psychopathy were more frequent and versatile offenders compared to Dyck et al.'s (2013) low-symptom group. The frequency and versatility of offending are conceptually similar to behavioral measures within the PCL:YV's antisocial facet. Although the Dyck et al. (2013) study is undoubtedly beneficial to understanding the association between psychopathy and offending, offending frequency was examined rather than offending trajectories. A consequence is that (a) groups of offenders were examined *ex ante*, and (b) offending frequency over age was not examined to differentiate high rate offenders that stopped offending in adulthood versus high rate offenders that continued to offend in adulthood.

Using data from the Cambridge Study in Delinquent Development (CSDD), Piquero et al. (2012) were the first to examine the relationship between symptoms of psychopathy and offending trajectories. Trajectories were measured from adolescence through age 40 for a subsample of 304 of the original 411 boys born recruited in South London in 1953 as part of the CSDD. Five offending trajectories were identified: non-offenders (62.3%), low adolescence peak offenders (18.6%), low rate chronics (11.3%), high adolescence peak offenders (5.4%), and high rate chronics (2.5%). This study represented a departure from the typical taken within research on psychopathy, where psychopathy is measured as an independent variable and then offending outcomes are evaluated after a follow-up period[20]. Here, psychopathy, assessed using the PCL:SV (Hart et al., 1995), was not measured until age 48. By this design, offending trajectories were one of a total of 27 variables independent variables that were used to predict PCL:SV scores at age 48. A key assertion in this study was that there was sufficient research indicating that psychopathy is stable across the life course, and, therefore, retrospective analysis across the previous life course stages regarding its association with criminal trajectories is theoretically appropriate. To examine the relationship between psychopathy

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[20] Importantly, this is not meant to be a specific critique of the research design of the CSDD, as this study began long before the systematic measurement of psychopathy

and offending trajectories, PCL:SV scores were measured in a number of different ways, including specific examination of scores on Factor 1 (F1) and Factor 2 (F2) of the PCL:SV, which combine interpersonal/affective facets and lifestyle/antisocial facets, respectively. The authors also examined each of the individual PCL:SV facets (interpersonal, affective, lifestyle, and antisocial) as well as total PCL:SV scores. Piquero et al. (2012) observed significant relationships between symptoms of psychopathy and association with the highest-rate offending trajectory, regardless of the type of PCL:SV factor structure examined. Other than the interpersonal facet, as anticipated, the most serious offense trajectory, the high-rate chronic group, had the highest average PCL:SV factor/facet scores and total scores (12.17), whereas the trajectory showing the earliest signs of desistance had the lowest PCL:SV scores. (Piquero et al., 2012).

Very importantly, Piquero et al. (2012) examined the impact of offending trajectories on psychopathy scores, controlling for two indexes of individual and environmental factors comprised of 27 unique variables. All factors were based on measures to age 10 and before any criminal activity, which avoided criterion contamination. The individual index was comprised of dichotomous scores for 12 risk/independent variables: (1) low junior school attainment, (2) daring disposition, (3) small height, (4) low nonverbal IQ, (5) nervous/withdrawn boy, (6) high extraversion of boy, (7) high neuroticism of boy, (8) psychomotor impulsivity, (9) dishonest, (10) unpopular, (11) troublesome, and (12) lacks concentration/restless. The environmental index was comprised of 15 environmental risk factors: (1) harsh attitude/ discipline of parents, (2) teen mother at birth of first child, (3) behavior problems of siblings, (4) criminal record of a parent, (5) delinquent older sibling, (6) large family size, (7) poor housing, (8) low family income, (9) parental disharmony, (10) neurotic/depressed father, (11) neurotic/depressed mother, (12) low socio- economic status, (13) separated parents, (14) poor supervision, and (15) high delinquency rate at school. Controlling for these two indexes, the offending trajectories remained significantly and strongly associated with PCL:SV scores (Piquero et al., 2012).

Although the Piquero et al. (2012) study remains one of the most elaborate and theoretically insightful examinations of criminal offense trajectories and other correlates associated with psychopathy, it relies on a retrospective utilization of the psychopathy

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construct. In addition, these researchers acknowledged the extensive and continuing controversies concerning construct validity issues as well as related issues concerning the measurement of psychopathy within community samples. Piquero et al. (2012) discussed the difficulty of justifying the minimum cut-off point on the PCL:SV in their community sample. Although 18 and higher has been considered one PCL:SV cut-off standard (Hart et al., 1995; Cooke, Michie, Hart, & Clark, 2005), they argued that 16 and higher was appropriate for community samples. Arguably, the main justification for essentially arbitrary cut-off points (i.e., the absence of theoretically/conceptually justified minimums) is for their clinical use and the application of diagnostic categories. These researchers appropriately asserted that the dimensional theoretical/conceptual perspective of personality disorders did not require cut-off points but rather simply relied on the use of ordinal categories (e.g., more or less psychopathy). Only two individuals in the CSDD were categorized as "severe" (i.e., 16 or higher PCL: SV total score), whereas 33 cases had scores of 10 or higher. The latter group had a higher likelihood of being convicted at age 40 and had a higher number of average convictions than those below the 10-point cut score. From the traditional trajectory perspective, this finding suggested more symptoms of psychopathy decreased the likelihood of desistance. Yet, with only eight individuals in the high chronic group, it was not evident that this community sample, as Piquero et al. (2012) acknowledged, allowed for a fuller examination of the relationship between psychopathy and criminal offense trajectories (also see, DeLisi & Piquero, 2011). In sum, despite dozens of studies on psychopathy and over 80 studies on offending trajectories (Piquero, 2008), there is a noticeable lack of research bringing the two research interests together. This absence is explained by several conceptual challenges, which were addressed in the current study.

5.1.6. Integrating the Psychopathy Construct within Criminal Career Research: Conceptual Challenges

In addition to the abovementioned specific conceptual challenges with trajectory research, there also conceptual challenges involved in incorporating psychopathy within criminal career research, trajectory research in particular. Construct validity and research design concerns help to understand the paucity of research concerning psychopathy and desistance. One challenge relates to tautological concerns. Antisocial behavior markers

of typical psychopathy measures, rather than more traditional affective and interpersonal symptoms of psychopathy, were more strongly associated with recidivism in several studies (e.g., Corrado et al., 2004; Walters, 2003). As such, Walters (2004) suggested that the psychopathy construct was not a necessary part of the explanation of serious criminality and that the Antisocial facet of the PCL:YV, the strongest predictor of offending, was essentially already accounted for by low self-control, making psychopathy a relatively redundant construct. However, the studies that Walters (2004) referred to were primarily based on measuring recidivism outcomes and institutional misbehavior within incarcerated samples (see Walters, 2003). Most individuals within this population recidivate (e.g., Gretton et al., 2004; Harris, Rice, & Lalumière, 2001), meaning that such a common event likely cannot be explained by a factor (i.e., psychopathy) that is much rarer within this population (see Figure 3.2 in Chapter 3). Indeed, it is well known that recidivism is a relatively poor indicator of desistance (Lussier, McCuish, & Corrado 2015). Psychopathy may be better suited to explaining differences in offending trajectories through adulthood that better encompass the full range of offending patterns within incarcerated samples.

Another concern is related to research design issues; specifically, the full range of symptoms of psychopathy is rarely captured among a sufficient proportion of the sample population. The issue is not simply confined to the Piquero et al. (2012) study discussed above. Nearly all criminology-based studies on psychopathy have utilized general population samples[21]. This research design strategy is understandable given that the most influential criminological longitudinal studies have focused on the development of offending more broadly and, therefore, emphasize generalizability. However, studying the influence of psychopathy within general population samples where, typically, there is little variance in symptoms of this disorder poses several challenges, even when psychopathy is viewed as a dimensional construct. Although the efficacy of antisocial over affective/interpersonal symptoms of psychopathy has also been observed in community-based studies (e.g., Monahan et al., 2001), the full range of symptoms of psychopathy are rarely observed in these normative samples. For example, using data from the MacArthur Study of Mental Disorders and Violence, Skeem and Mulvey (2001) observed that the

[21] Of the three limitations presented, this third limitation is likely affected the most by the lack of new longitudinal studies in the field of criminology.

average score on the PCL:SV Factor 1 score (emotional detachment) for the sample was 3.11 (out of 12), less than half the average observed in some correctional samples (e.g., Douglas, Strand, Belfrage, Fransson, & Levander, 2005). Indeed, in the MacArthur Violence Risk Study, 50% of the sample scored either a zero or one on the PCL:SV (Neumann & Hare, 2008).

The purpose of the current study was to address the lack of research that has examined the association between psychopathy and different offense-based trajectories. Although a number of studies have examined psychopathy's association with recidivism and offending frequency, these studies have not examined the development of offending over time; something that can be explored with SPGM. Individuals following chronic offending trajectories and individuals following less active offending trajectories were compared in relation to scores on the PCL:YV. The individuals assessed using the PCL:YV in the current study had all been incarcerated in open and secure custody facilities in British Columbia, Canada between 1998 and 2001, which follows the recommendation by Piquero et al. (2012) that offense trajectory studies assess psychopathy in adolescence and within a high-risk sample. Most research on criminal trajectories has relied on community-based samples (e.g., Piquero, 2008), and thus the generalizability of the current study is not as broad. However, this limitation was mitigated by the inclusion of a larger percent of the sample that were frequent offenders, which is needed in order to examine whether risk factor differences can be found between offending trajectories characterized by desistance versus persistence between adolescence and adulthood. Other critical criminogenic risk factors were also measured to examine the importance of psychopathy as a barrier to desistance above and beyond other covariates.

5.2. Methodology

5.2.1. Sample

The first wave of data collection as part of the Incarcerated Serious and Violent Young Offender Study (ISVYOS) ran between 1998 and 2001. As part of this study, adolescent offenders between the ages of twelve and nineteen were interviewed in open and secure custody facilities within the Greater Vancouver Regional District and

surrounding areas. Of the 507 adolescent offenders interviewed, 326 had adequate file and interview information that permitted completion of the PCL:YV. With the exception of seven percent of the sample who were twenty-seven at the time of data collection, convictions for all offenders were coded until age twenty-eight. The sample is overwhelmingly composed of male (80.4%) and Caucasian (60.9%) offenders. The average age of offenders at the time of their PCL:YV assessment was approximately 16. The sample used was very specific (Canadian incarcerated adolescent offenders), which could limit generalizability. For example, although only 4.9% of the population of British Columbia self-identifies as Aboriginal, approximately 25% of offenders in the current study self-identified as Aboriginal. The over-representation of Aboriginal offenders is dissimilar from most incarcerated samples in the United States (e.g., Teplin et al., 2013), although the over-representation of Aboriginal offenders in this sample mirrors the over-representation of Black and Hispanic offenders in incarcerated samples found in the United States and is also similar to the over-representation of Aboriginal offenders in some US States such as Alaska, North Dakota, South Dakota, and Montana, where Native Americans account for 29–42% of all youth in custody (Cross, 2008). Additionally, because all offenders were incarcerated at the time of their interview, the sample in the current study could have differed from other juvenile offenders who received a less severe non-custody based sentencing option (e.g., probation).

5.2.2. Procedure

The purpose of the ISVYOS study was to conduct interviews with juvenile offenders and collect file-based information on risk factors associated with the onset, persistence, and/or desistance of adolescent criminal activity and to identify risk factor profiles associated with the development of serious and violent offending. To recruit research participants, informed consent was first sought and provided by the British Columbia Ministry of Child and Family Development (MCFD). MCFD serves as the legal guardian to all youth in custody, and their consent allowed the research team to approach youth in custody centers throughout the province of British Colombia. Youth were approached by a member of the research team at their respective custody center and asked whether or not they wanted to participate. Participants were eligible for the current study provided that they met several criteria: (1) were English-speaking, (2) demonstrated

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an understanding of interview questions (e.g., had no noticeable deficits in IQ), and (3) were willing to provide accurate information. Of those eligible, only approximately 5% of youth declined to participate. All subjects were informed that the information they provided would be kept confidential, with the exception of the subject making a direct threat against themselves or someone else. To improve the reliability of the participant's self-reported information, research assistants (RAs) were granted access to case management files, which contained the participant's presentence report and information on their behavior while in the institution. Access to file information prior to interviews allowed RAs to be aware of discrepancies between interview responses and official records.

5.2.3. Measures

Ethnicity and gender were measured through self-report interviews. Although some offenders in the current study were in their early thirties, criminal trajectories were only measured to age 28 for all participants. As age comprised one half of the dependent variable in the current study (i.e., frequency of offending over age) and therefore it was unnecessary to control for age in subsequent analyses. The primary focus within the current study was on whether symptoms of psychopathy, controlling for other criminogenic factors, acted as a barrier to desistance in adulthood. All criminogenic risk factors were measured at the time of the subject's interview during their incarceration in adolescence. Seven domains of risk were examined: substance use, school behavior issues, abuse experiences, sexual activity, personality development, residential mobility, and aggression. All of these measures are outlined below in greater detail. Characteristics of the sample are summarized in Table 5.1.

Psychopathy Checklist: Youth Version

The PCL:YV (Forth et al., 2003) is a symptom rating scale that is coded using information from a 60-90 minute semi-structured interview and a review of file-based collateral information, including information on the offender's family environment, substance use, and physical and mental health. The PCL:YV rating scale ranges from 0-2 (0 = *item does not apply*; 1 = *item applies somewhat*; 2 = *item definitely applies*). Access

to file information, in addition to interviews, were used to score the PCL:YV[22]. Corrado et al. (2004) evaluated inter-rater reliability in a subsample of 30 randomly selected cases and the intraclass correlation coefficient was high ($ICC_1 = 0.92$). In terms of reliability, Cronbach's alpha is typically used to assess scale reliability, including the reliability of the PCL:YV for Aboriginal offenders (e.g., Forth et al., 2003). However, Cronbach's alpha was designed to evaluate the reliability of scales comprised of interval-level items. Gadermann, Guhn, and Zumbo (2012) illustrated that Cronbach's alpha under-estimated the reliability of scales comprised of nominal or ordinal-level items. As well, there is a tendency for Cronbach's alpha values to be lower within scales consisting of a smaller number of items (Cortina, 1993), such as the PCL:YV facet scales. Taken together, prior studies addressing the reliability of the PCL:YV may have underestimated the reliability of the PCL:YV. To ensure appropriate testing, the current study calculated both Cronbach's alpha values and polychoric ordinal alpha values. The latter were calculated using SAS 9.4 to identify the average polychoric correlation between items within each of the four PCL:YV facets and then using the formula $\alpha = (k \times r_{avg}) / (1 + (k - 1) r_{avg})$ to obtain polychoric ordinal alpha values. As expected, polychoric ordinal alpha values were always higher compared to Cronbach's alpha values. Overall, based on polychoric ordinal alpha values, reliability was moderate to high at the factor level and facet level.

The 20 items comprising the PCL: YV were believed to represent the fundamental personality and behavioral traits represent the construct of psychopathy in adolescence. The items are typically summed to provide a score out of 40. Although there is no diagnostic score to categorically define adolescents who are psychopathic versus non-psychopathic, scores of thirty or higher are typically considered indicative of psychopathy-related personality disturbance. A series of confirmatory factor analyses in prior studies have examined the manner in which these 20 items represent different facets of the underlying psychopathy construct. Forth et al. (2003) recommended using a four factor model that consists of an interpersonal factor, an affective factor, a lifestyle factor, and an antisocial factor. Cooke and Michie (2001) recommended a three-factor model that excludes Forth et al.'s (2003) antisocial facet to avoid using prior criminal behavior to predict future criminal behavior. Scores from both models as well as individual facet scores

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[22] The manualized version of the PCL: YV (Forth et al., 2003) was not available when interviews were taking place. The version used in the current study is the same used in Forth (1995).

were examined in the current study. Total scores, aggregated factor scores, and individual facets are presented in Table 5.1. Total scores did not differ between males and females. Approximately one third of the sample scored what could be considered 'high' on the PCL: YV (25 or higher).

Table 5.1: Descriptive characteristics of the sample (*n* = 326)

Individual characteristics	n (%)	Mean (SD)
Demographic Characteristics		
Gender		
Male	262 (80.4)	
Female	64 (19.6)	
Ethnic origin		
Caucasian	195 (60.6)	
Aboriginal	81 (25.2)	
Other	46 (14.3)	
Measures of psychopathy		
Total PCL: YV Score		21.19 (6.37)
Four factor model		19.50 (5.82)
Three factor model		12.41 (4.56)
Interpersonal factor		3.00 (2.04)
Affective factor		4.36 (2.01)
Lifestyle factor		5.04 (2.03)
Antisocial factor		7.09 (2.26)
Criminogenic risk factors- offender		
Age of onset – alcohol use		11.97 (2.14)
Age of onset – drug use		11.75 (2.15)
Substance use versatility scale		4.31 (2.11)
Enrolled in school	161 (50.0)	
Age of onset – skipping school		12.29 (1.98)
Age of onset – trouble at school		9.73 (3.14)
Number of different schools		6.31 (6.17)
Physical abuse	148 (46.5)	
Sexual abuse	72 (22.9)	
Age of onset – sexual activity		13.05 (1.67)
Positive self identity		71.16 (10.41)
Prosociality		19.06 (4.09)
Obedience		24.53 (5.14)
Hyper-masculinity		19.58 (3.81)
Fighting – weekly basis	82 (28.0)	
Angers easily	176 (56.6)	
Bad temper	234 (74.8)	
Criminogenic risk factors- family		
Family disruption scale		2.76 (1.48)
Left home for 24hr	240 (76.4)	
Kicked out of home for 24hr	141 (45.8)	
Raised by biological parents	203 (65.3)	
Criminal career measures		
Days in custody		1,166 (1,167)
Age of onset		14.09 (1.55)
Offending frequency		23.60 (18.03)

Criminogenic Risk Factors

Descriptive information for each risk factor from different domains of functioning is reported in Table 5.1. Substance use included separate measures of the age of onset of alcohol and drug use as well as eight dichotomized items (alcohol, marijuana, hallucinogens, ecstasy, cocaine, heroin, crack cocaine, and crystal meth) used to create an aggregate scale of self-reported substance use. Scale reliability was high (0.88) based on the tetrachoric ordinal alpha value, which is more reliable than Cronbach's alpha for dichotomous items (Gadermann et al., 2012). School behavior issues included the age at which participants began getting into trouble at school, the age at which they started skipping school, the number of times that they changed schools, and whether they were attending school prior to their incarceration. Abuse experiences included dichotomous self-report measures of whether the youth had experienced physical abuse and sexual abuse. Sexual activity was measured as the age of onset of consensual sexual activity. Personality development was measured using Schneider's (1990) Good Citizen's Scale, a self-report inventory of 15 identity traits coded on a 1-7 scale (Cronbach's alpha = 0.74). Items on this scale were coded so that lower scores indicated a negative identity. Aggression was assessed by asking participants about the frequency of their involvement in physical fights, whether the participant felt they got angry easily, and whether the participant reported that someone had told them they had a bad temper. To measure familial delinquency and disruption, participants were asked to report whether any of their biological parents or biological siblings had trouble with alcohol and/or drugs, had experienced physical and/or sexual abuse, had a criminal record, or had mental illness. These six items were aggregated into a global scale (tetrachoric ordinal alpha = 0.78). Residential mobility measured whether the participant had left home willingly for more than a day to live somewhere else, whether the participant had been kicked out of their home for more than a day, whether the participant was raised by their biological parents, and whether the participant lived in foster care or other forms of ministry care.

Measures of Offending and Exposure Time

Offending was measured using official data from British Columbia Corrections' computerized system, Corrections Network (CORNET), which contains information on an

offender's movement in and out of custody as well as the exact criminal offense, date of conviction, and sentence type received. Some of this information is reported in Table 5.1. CORNET data includes only offenses committed within the province of British Columbia, meaning that if a participant committed new crimes outside of the province, nothing in the data could account for these offenses. Using data from this computerized system, every criminal charge that resulted in a conviction was coded for the entire sample from age 12, the age of criminal responsibility in Canada, to age 28. In line with prior studies measuring offending trajectories, for the seven percent of offenders who had not reached age 27, their offending for age 28 was coded as missing (Eggleston, Laub, & Sampson, 2004; Livingston, Stewart, Allard, & Ogilvie, 2008; van der Geest et al., 2009). Also in accordance with these studies, because 11 offenders died (3.4%) and six (1.8%) moved outside the province, convictions for these offenders after the age of death or move were coded as missing rather than as 'zero'. Accounting for death in longitudinal studies is especially important in order to avoid false-positives when reporting the prevalence of desistance.

For this sample, the average number of charges for which the individual was convicted for was 23.28 (SD = 17.46). The median number of convictions was 19.5, showing that the higher number of convictions was not an artifact of a small subgroup of individuals. The vast majority of the sample (84.0%) had been convicted of a violent offense. Age of onset, based on age at first court appearance was, on average, fourteen years old. In total, 13.5 % and 27.0 % of the sample first appeared in court at 12 and 13 years old, respectively. Total time spent in custody was also calculated and controlled for. On average, offenders spent 1,166 (SD = 1,167) days in custody. The median number of days in custody was 771 and twenty-five percent of the sample spent at least 1,875 days in custody from age 12 to 28. Figure 5.1 displays the mean number of convictions at each age for males and females. Although the number of convictions appears to peak in adolescence and begin to quickly decline thereafter (i.e., showing an early pattern of desistance), the number of months in custody for males remains relatively stable from adolescence to adulthood, defined as age 18 and beyond, which highlights the importance of accounting for exposure time when analyzing offending trajectories. The number of months spent in custody over age also strongly varied from average number of months spent in custody for participants from the Gluecks' Unraveling Juvenile Delinquency (UJD)

study. From age 20-28, members of the UJD study averaged approximately 2.5 months in custody across each age-period (see Figure 9, Sampson & Laub, 2003), whereas members of this sample never averaged less than 2.5 months in custody during *any* age period between 18-28.
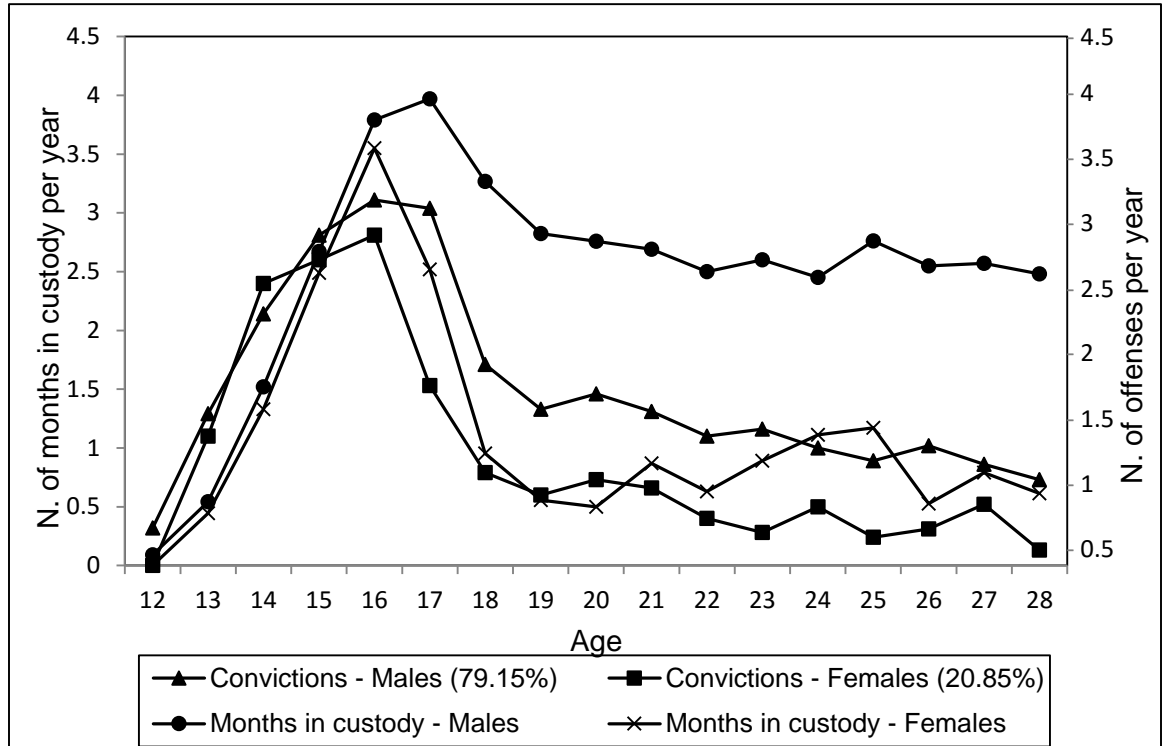
Figure 5.1: Average conviction rate and incarceration length for males and females from age 12 to 28

Using information uploaded to CORNET, exposure time was accounted for by measuring each date of admission and date of release from custody for each offender. Syntax was written for SPSS IBM version 18.0 so that the amount of time spent in custody over the duration of each year of age could be identified for each offender. Exposure time was measured to control for the amount of time that offenders would be unable to commit any offenses due to the lack of opportunity created by incarceration (Nagin, 2004; van der Geest et al., 2009). A measure of exposure time should be especially critical for all studies using an offender or at-risk sample given the substantial amount of time spent in custody by these two populations, the former in particular (see Eggleston et al., 2004). If prior offending trajectory studies failed to control for exposure time, chronic offenders with

lengthy incarceration periods could have been misclassified as desisters. In turn, this may be a partial explanation for why prior studies have found it challenging to identify differences between chronic offenders and desisters. Moreover, discrepancies in prior research concerning the shape and peak of chronic offending trajectories (see Skardhamar, 2010) may be related to some studies accounting for exposure time whereas others did not. Total time spent in custody was also calculated to examine the association between offending trajectory and length of incarceration.

5.2.4.   Analytic Strategy

Nagin and Land (1993) introduced semi-parametric group based modeling (SPGM) as an analytic technique that was suitable for measuring trajectories of offending over substantial periods of time. Unlike cluster analysis and other grouping methods, SPGM does not identify groups *ex ante* (Nagin, 2005). Instead, this method allows distinct developmental trajectory groups to emerge from the data, rather than assume their existence (Nagin, 2005). Although this method has been widely used (Piquero, 2008), it has also recently been criticized as a technique that is not suitable for identifying evidence for a taxonomy (e.g., Skardhamar, 2010). The validity of Skardhamar's critique has been questioned (see Brame, Paternoster, & Piquero, 2012 for a response) and in the current study it does not seem to apply, given the purpose of this study is not to provide evidence of a taxonomy. Piquero et al.'s (2001) formula for calculating exposure was used; however, following the example in van der Geest et al. (2009), Piquero et al.'s (2001) formula was adjusted to avoid high standard errors and improbable rates of offending. Van der Geest et al.'s (2009) formula constrained the minimum exposure value to 0.5. In effect, if an offender spent one year in custody, they were coded as spending only half of a year in custody. This was appropriate for a sample from the Netherlands, where sentences tend to be more lenient than in other countries (Blokland, Nagin, & Nieuwbeerta, 2005). In the current study, an average of 13 offenders spent the full year in custody during any given year. A minimum exposure time of 0.5 would over-represent the length of time that many offenders spent in the community, increasing the risk of identifying persistent offenders as desisters. As such, van der Geest et al.'s (2009) formula for exposure time was adapted so that the minimum exposure time would be approximately 0.2. In effect, spending 12 months in custody would be adjusted to nine months in custody. The

exposure time formula was estimated the same way at each age. The formula for exposure was:

Exposure$_{ji}$ = 1 - (Number of Days Incarcerated/455[23])

where j is the respondent and i is the year of observation.

Analyses were conducted in SAS 9.4 using the Proc TRAJ add-on developed by Jones and colleagues (2001) (see also Jones & Nagin, 2007). The current study used the zero-inflated Poisson (ZIP) model with quadratic functional form to estimate the distribution of the offending trajectories. The ZIP model is most commonly used to examine criminal careers because it accounts for periods of criminal inactivity that are particularly common as individuals enter adulthood (Nagin, 2005). Bayesian Information Criteria (BIC) values were used to identify the number of offending trajectories that best represented the data. BIC is the most commonly used option for determining model selection because it balances fit and parsimony by penalizing the addition of more groups to the model (Nagin, 2005). BIC closer to zero values generally indicate an improvement in model fit. In addition, the Bayes factor approximation should also be examined to determine whether the difference in BIC values between two models is substantive (Nagin, 2005). SPGM allows for the inclusion of multiple risk factors that predict the probability of trajectory group membership. Due to the imperfect classification accuracy of the group-based method, the association between risk factors and group membership is estimated simultaneously with the trajectories to account for the uncertainty associated with assignment to a particular trajectory. In Proc TRAJ, multinomial logistic regression (MLR) is used, and the reference group typically refers to the lowest trajectory (i.e., the least serious; Nagin, 2005; van Domburgh et al., 2009). The association between trajectories, psychopathy, and criminogenic factors were examined in a series of bivariate analyses. All significant criminogenic risk factors and measures of psychopathy were then included in a MLR analysis to examine whether these factors helped predict offending persistence or desistance.

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[23] In this study, days incarcerated was divided by 455 (one year and three months) whereas van der Geest et al. (2009) divided by 760 days (two years).van der Geest et al. (2009) used on a sample of less serious (i.e., frequent) offenders and thus the original formula would overestimate the amount of time that offenders in the current sample spent in the community.

5.3. Results

5.3.1.   Model Identification and Interpretation

The SPGM analyses in the current study proceeded in two stages, the first involved model identification, which focused on identifying the number and shape of the offending trajectories that best fit the data. A four group quadratic model resulted in a BIC value of -8530, which was closer to zero than both a three group model (BIC = -8803) and a five group model (BIC = -8543). BIC values for a four group solution with quadratic functional form were also closer to zero than the same model with cubic functional form. In addition, Jeffrey's scale of evidence based on the Bayes factor approximation was used to determine whether there were substantive differences in BIC values between models specifying a different number of trajectory groups (e.g., Nagin, 2005). Jeffrey's scale of the evidence of the Bayes factor is calculated as $e^{BICi - BICj}$ where values of B_{ij} greater than ten indicate strong evidence for model 'i (see Nagin, 2005). Based on the BIC values of a ZIP model with quadratic functional form, there was strong evidence for a four group model over a five group model (B_{ij} >10) but not for a three group model over a four group model (B_{ij} <10). The parameters of the four group model are outlined in Table 5.2 and help support the retention of a four group model. Classification accuracy based on the average posterior probability of accurately assigning individuals to a particular trajectory was high for all four trajectories (range of 0.92-0.94). Odds of correct classification (OCC) was used to help provide confidence that individuals were assigned to the appropriate trajectory group. OCC values for each trajectory group were calculated as:

$OCC_g = (AvePP_g/ (1-AvePP_g)) / (\prod_g/ (1-\prod_g))$

where $\prod_g$ is the estimated size of group g (see Skardhamar, 2010).

As indicated in Table 5.2, OCC values for the four trajectories ranged from 11-15, higher than both Nagin (2005) and Skardhamar's (2010) recommendation that values of at least five be interpreted as a sign of high classification accuracy.

Table 5.2: Fit statistics for a zero-inflated poisson model with four trajectories (*n* = 326)

	Offending Trajectories			
	Bell Shape	Slow Desisters	SRC	HRC
n (%)	93 (28.5)	91 (28.0)	62 (19.0)	80 (24.5)
Estimated model parameters				
Intercept	-26.51	5.76	-3.22	-19.26
Linear	3.66	-0.39	0.46	3.50
Quadratic	-0.12	0.01	-0.01	-0.18
Model fit characteristics				
Peak age	15	15	17	16
Median group probabilities	0.99	0.97	0.99	0.99
Range	0.29-1.00	0.55-1.00	0.43-1.00	0.54-1.00
Mean probability-Bell Shape	0.92 (0.16)	0.06 (0.08)	0.00 (0.00)	0.00 (0.02)
Mean probability-Slow Desisters	0.02 (0.07)	0.94 (0.08)	0.02 (0.07)	0.04 (0.11)
Mean probability-SRC	0.00 (0.02)	0.02 (0.08)	0.93 (0.13)	0.05 (0.09)
Mean probability-HRC	0.00 (0.01)	0.02 (0.06)	0.04 (0.09)	0.94 (0.10)
OCC	11.39	15.51	13.03	15.51
Criminal career parameters				
Age of onset	14.46 (1.56)[d]	14.37 (1.37)[d]	14.11 (1.86)[d]	13.31 (1.15)[abc]
Total convictions	7.95 (5.65)	14.10 (8.84)[acd]	39.01 (16.31)[ab]	40.49 (11.85)[ab]
Total custody length (days)	380 (705)[cd]	682 (872)[cd]	1859 (987)[ab]	2088 (1084)[ab]

Note. HRC = high rate chronic, SRC = Slow rising chronic. [a] Significantly different from Bell Shape, [b] Significantly different from Slow Desisters, [c] significantly different from SRC, [d] Significantly different from HRC

Figure 5.2 presents the four trajectories. The bell-shaped trajectory (28.5% of the sample) represented a group of low rate offenders. For this trajectory, offending typically began at age 13-14, peaked at age 15, began a desistance process in late adolescence, and reached an absolute zero rate by 23. The second trajectory group, slow desisters, comprised just over a quarter of the sample (28.0%). This group resembled the bell-shaped trajectory but differed in that individuals in this group continued to offend, albeit at a low rate indicative of the slowing-down process associated with desistance, throughout their twenties. The third trajectory group, referred to as slow-rising chronics (SRC; 19.0%) offended during mid-adolescence at a rate that was similar to offenders in the bell-shaped and slow desister trajectories. However, by age sixteen, frequency of offending increased and offenders appeared to maintain a steady rate of offending throughout their twenties.

Finally, the high-rate chronic (HRC) offending trajectory (24.5%)[24] began offending much earlier than the other three trajectories and showed a steady increase in offending throughout adolescence. However, during adulthood, a process towards desistance appeared to emerge as the rate of offending declined and was surpassed by the offending rate in the SRC trajectory. As indicated at the bottom of Table 5.2, the two chronic trajectories (SRC and HRC) differed from the two trajectories characterized by desistance (bell-shaped and slow desisters), with the differences being in the theoretically expected direction. The association between trajectories, demographic characteristics, criminogenic risk factors, and psychopathy is outlined in Table 5.3.

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[24] This trajectory group was modeled using cubic functional form to reduce the size of the 95% confidence interval associated with the same trajectory modeled using quadratic functional form.
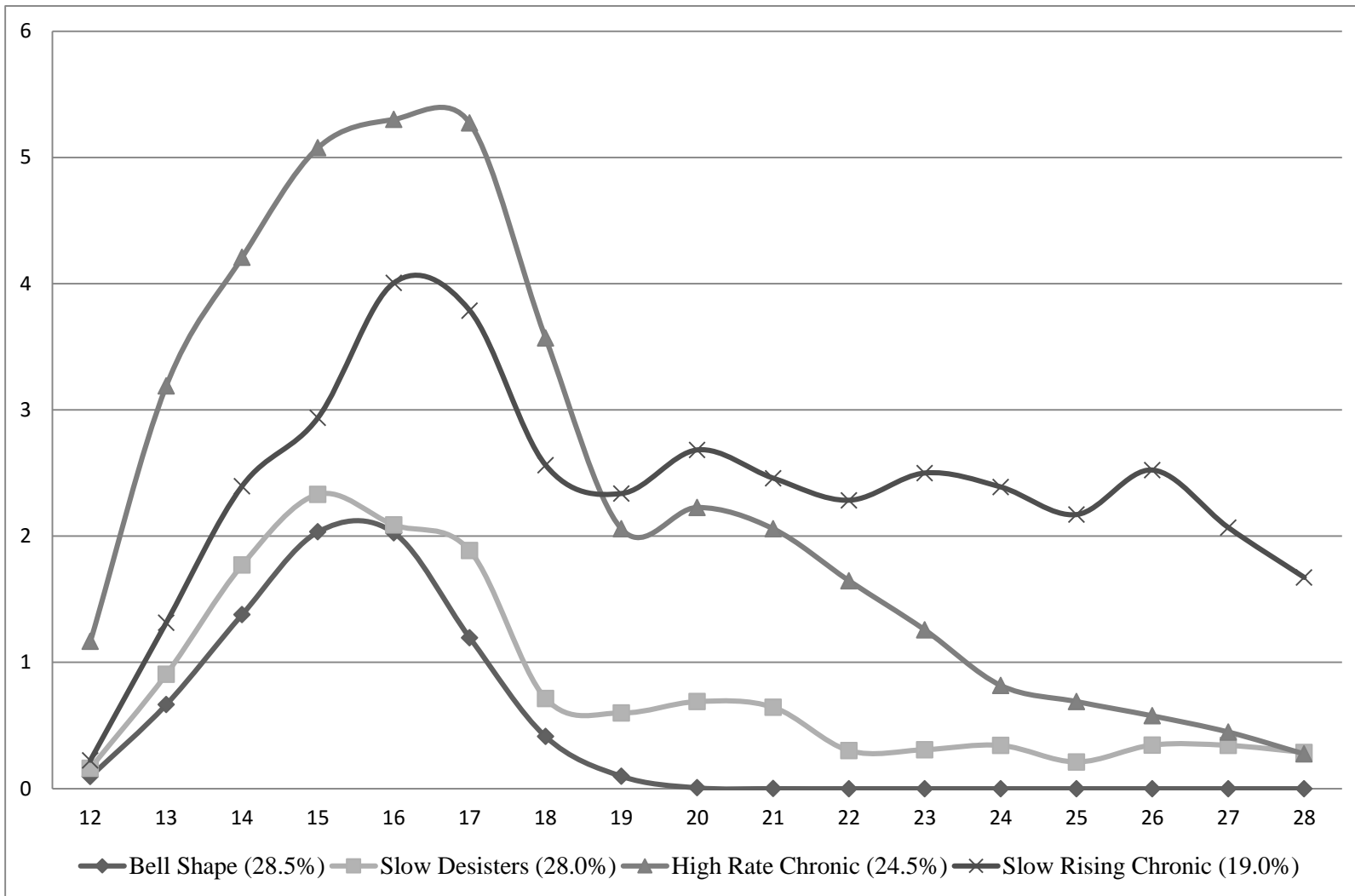
Figure 5.2: Offending trajectories (convictions over age) from age 12 to 28

For the bivariate analyses that involved ANOVA, Bonferroni (equal variances assumed) or Tamhane (equal variances violated) post-hoc comparisons were used to identify significant differences in risk factors between trajectories. Eta squared was used to provide an indication of effect size. In terms of demographic characteristics, males comprised the vast majority of the SRC (88.7%) and HRC trajectories (95.0%). It appeared that chronic offending, as defined in this study, was almost exclusively a male phenomenon. In other words, desistance was expected for virtually all female offenders in the sample. If a chronic offending trajectory showing continued offending between adolescence and adulthood does exist for female offenders, it is likely characterized by a lower rate of offending relative to male chronic offending trajectories. Identifying this female chronic offender trajectory may require conducting SPGM separately for females. In terms of ethnicity, Asian, East Indian, Middle Eastern, and African-Canadian offenders (i.e., those who comprised the 'Other Ethnicity' category) were more likely to be in the two desistance trajectories (bell-shaped and slow desister) compared to the two chronic trajectories. In terms of criminogenic risk factors, five of the seven risk factor domains had at least one risk factor that differed between trajectories. Compared to the bell-shaped trajectory, the SRC trajectory had higher scores on the substance use scale and the negative self-identify scale and were also more likely to report getting into fights weekly. An earlier age of getting into trouble at school, an earlier age of onset of sexual activity, and a more negative self-identity differentiated the HRC trajectory from the bell-shaped trajectory. Significant differences in criminogenic risk factors were not observed between the slow desister trajectory and the other three trajectories.

Comparisons between psychopathy scores and offending trajectories revealed a number of important differences. When the PCL:YV four factor model was examined, the HRC and SRC trajectories were observed to have significantly higher scores compared to the two trajectories characterized by early desistance (the bell-shaped trajectory and the slow desister trajectory). However, when a three factor model was examined, the HRC trajectory but not the SRC trajectory had significantly higher scores compared to the other two trajectories. When the four PCL:YV facets were examined independently, the SRC trajectory had significantly higher scores than the bell-shaped and slow desister trajectory on measures of the antisocial facet but not the other three facets. In contrast, the HRC trajectory scored significantly higher on the affective, lifestyle, and antisocial facets

compared to the bell-shaped and slow desister trajectories. This indicated that symptoms of psychopathy may be more salient for the HRC trajectory, whereas antisocial markers best characterized the SRC trajectory.

Table 5.3: Trajectory groups and different individual level characteristics (n = 326)

	Trajectories				χ^2/F, p, Φ/η^2
	Bell-Shape	Slow Desister	SRC	HRC	
n (%)	93 (28.5)	91 (28.0)	62 (19.0)	80 (24.5)	
Demographic characteristics					
Male	57 (62.6)	74 (79.6)	55 (88.7)	76 (95.0)	χ^2 (3)=31.76, p < .001, Φ=.31
Ethnicity					
Caucasian	56 (62.9)	47 (51.6)	36 (58.1)	56 (70.0)	n.s.
Aboriginal	15 (16.9)	24 (26.4)	22 (35.5)	20 (25.0)	n.s.
Other	18 (20.2)	20 (22.0)	4 (6.5)	4 (5.0)	χ^2 (3)=15.7, p < .01, Φ=.22
Measures of psychopathy					
Four factor model	17.71 (6.07)[cd]	17.97 (5.31)[cd]	20.36 (5.91)[ab]	22.58 (4.61)[ab]	F (3) = 14.3, p < .001, η^2 = .12
Three factor model	11.55 (4.87)[d]	11.46 (4.12)[d]	12.73 (4.82)	14.24 (3.93)[ab]	F (3) = 7.2, p < .001, η^2 = .06
Interpersonal factor	2.88 (1.98)	2.73 (1.98)	3.18 (2.11)	3.33 (2.11)	n.s.
Affective factor	4.11 (2.17)[d]	4.20 (2.09)[d]	4.20 (2.09)	5.03 (1.65)[ab]	F (3) = 4.2, p < .01, η^2 = .04
Lifestyle factor	4.57 (2.20)[d]	4.60 (1.85)[d]	5.35 (2.00)	5.87 (1.73)[ab]	F (3) = 8.61, p < .001, η^2 = .07
Antisocial factor	6.22 (2.39)[cd]	6.51 (2.30)[cd]	7.63 (1.76)[ab]	8.35 (1.68)[ab]	F (3) = 18.72, p < .001, η^2 = .15
Criminogenic factors					
Age of onset-alcohol use	12.09 (2.27)	12.24 (1.92)	12.16 (2.03)	11.38 (2.24)	n.s.
Age of onset- drug use	11.80 (2.19)	11.88 (2.27)	11.78 (2.19)	11.55 (1.92)	n.s.
Substance use versatility scale	3.86 (2.12)[c]	4.39 (2.15)	4.92 (1.81)[a]	4.29 (2.19)	F (3) = 3.0, p < .001, η^2 = .03
Enrolled in school	51 (56.0)	47 (51.1)	22 (36.1)	41 (52.6)	n.s.
Age of onset- skipping school	12.58 (1.98)	12.72 (1.78)	11.80 (2.06)	11.91 (2.01)	F (3) = 3.7, p < .05, η^2 = .04
Age of onset – school trouble	10.67 (3.16)[d]	9.79 (2.99)	9.49 (3.17)	8.90 (3.05)[a]	F (3) = 4.0, p < .01, η^2 = .04
Number of different schools	5.63 (5.44)	6.85 (7.88)	6.50 (5.62)	6.32 (5.08)	n.s.
Physical abuse	39 (43.3)	47 (51.6)	28 (46.7)	34 (44.2)	n.s.
Sexual abuse	26 (29.2)	25 (27.5)	10 (17.2)	11 (14.5)	n.s.
Age sexually active	13.46 (1.74)[d]	13.10 (1.58)	13.07 (1.64)	12.54 (1.61)[a]	F (3) = 4.0, p < .01, η^2 = .04
Positive self identity	74.15 (9.95)[cd]	70.64 (10.18)	69.88 (9.87)[a]	69.29 (11.04)[a]	F (3) = 3.7, p < .05, η^2 = .04
Fighting – weekly basis	11 (13.4)	21 (25.6)	28 (48.3)	22 (31.0)	χ^2 (3)=21.0, p < .001, Φ=.27
Angers easily	48 (53.3)	47 (54.0)	38 (62.3)	43 (58.9)	n.s.
Bad temper	60 (66.7)	65 (74.7)	52 (85.2)	57 (76.0)	n.s.
Family disruption scale	2.38 (1.76)	2.25 (1.61)	2.79 (1.50)	2.84 (1.55)	n.s.
Left home for 24hr	71 (78.9)	65 (73.9)	42 (70.0)	62 (81.6)	n.s.
Kicked out of home for 24hr	39 (44.8)	44 (50.6)	26 (43.3)	32 (43.2)	n.s.
Raised by biological parents	60 (68.2)	60 (68.2)	34 (57.6)	49 (64.5)	n.s.

Note. SRC = slow rising chronic, HFC = high rate chronic. [a] Significantly different from bell-shaped, [b] Significantly different from slow desister, [c] significantly different from SRC, [d] Significantly different from HRC. [†] Asymptotically F distributed

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5.3.2. The HRC Trajectory: Are They Really Desisting?

It was expected that symptoms of psychopathy would predict membership in the most chronic offending trajectory through age 28. Seemingly in contrast to this expectation, individuals in the SRC trajectory offended at a higher rate in adulthood compared to individuals in the HRC trajectory, yet symptoms of psychopathy seemed to better characterize the latter trajectory. However, it was possible that the SRC trajectory offended at a higher rate whereas the HRC trajectory committed more serious and violent offenses that would result in lengthier sentences and reduce additional offending opportunities. Clearly, based on Figure 5.2, the HRC trajectory offended at a higher rate in adolescence. Therefore, the specific focus of comparisons between the HRC and SRC trajectories was on their patterns of offending through adulthood. By age 20, the SRC trajectory's frequency of offending surpassed the HRC trajectory's frequency of offending. The analyses were thus focused on examining differences in the offending patterns between age 20 and 28 (see Table 5.4).

Although the SRC trajectory averaged a significantly greater number of convictions over this period, over this same period the SRC and HRC trajectories spent an equal length of time in custody. This suggested that although the HRC trajectory was committing fewer offenses, the offenses they did commit were resulting in lengthier sentences/periods of incarceration. Instead of looking at total convictions, total violent convictions from age 20 to 28 were measured. Despite the SRC group committing twice as many general offenses in adulthood compared to the HRC group, the average number of violent convictions between age 20 and 28 for the HRC group (1.51) did not differ from the SRC group (1.78). This suggested that HRC offenders were disproportionately involved in violent crimes compared to the SRC group. To explore this in greater detail, a violence specialization coefficient was calculated by dividing total violent convictions between ages 20-28 by total general convictions for the same period. The HRC offenders' proportion of violent offenses (0.15) was significantly higher than the average proportion of violent offenses for SRC offenders (0.08). Since violent offenses typically receive more punitive sanctions, it was possible that an offense seriousness metric would also help explain why the HRC trajectory appeared to be desisting from offending despite having the strongest

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association with symptoms of psychopathy. The seriousness metric was calculated by dividing the number of days spent in custody by the number of convictions incurred during the specified time period. In effect, the seriousness metric assessed the average length of an offender's sentence. The HRC trajectory averaged significantly higher scores on the seriousness metric compared to the SRC trajectory. In effect, the substantial amount of time spent in custody by the HRC trajectory had the potential to give the impression that this trajectory was characterized by desistance towards the end of an offender's twenties.

Table 5.4: Comparison of measures of offending between age 20-28 for SRC and HRC trajectories

	SRC ($n = 62$) m (sd)/% (n)	HRC ($n = 80$) m (sd)/% (n)	χ^2/t, p, Φ/d
Severity of Offending			
Days incarcerated†	1277 (641)	1101 (797)	$t(133.8)$= 1.38, n.s., d= .24
Total convictions	23.34 (10.58)	11.87 (7.24)	$t(135)$= 7.53, p < .001, d= 1.26
Violent convictions	1.78 (1.62)	1.51 (1.69)	$t(135)$= 0.92, n.s., d= .16
Violence specialization†	0.08 (0.08)	0.15 (0.16)	$t(113.7)$= -2.81, p < .01, d= .55
Seriousness metric†	63.16 (43.23)	155.44 (374.97)	$t(80.81)$= -2.17, p < .05., d= .35

† Levene's test of equal variance violated

Taken together, although initial findings shown in Figure 5.2 indicated that the SRC trajectory was a more frequent group of offenders between the age of 20 and 28, a closer look at the patterns of offending of the HRC group indicated that they were offending less often but were committing more serious offenses relative to the SRC trajectory. It should also be kept in mind that the formula for exposure time had to be constrained to avoid improbable rates of offending. Although this constraint was applied to all trajectories, it would have the largest impact on the group that had the lowest ratio of convictions to time incarcerated. The HRC group appeared to best resemble this type of group. In fact, on 93 occasions between age 20 and 28, an offender in the HRC trajectory was incarcerated for at least 365 consecutive days. As such, despite appearing to be a group of offenders in a phase of desistance, the HRC group is perhaps better characterized as a group of individuals with high symptoms of psychopathy that engaged in a variety of offenses in adolescence but transitioned towards more serious and violent offending in adulthood. The effect of symptoms of psychopathy on trajectory group membership was examined in greater detail by controlling for demographic characteristics and important criminogenic risk factors.

5.3.3. Psychopathy and other Covariates of Offending Trajectories

MLR analyses were performed to examine covariates associated with the offending trajectories. In addition to psychopathy, all significant variables examined in Table 5.3 were included in subsequent analyses. Three different models were produced to examine the predictive utility of the four factor structure, three factor structure, and the four individual facets: interpersonal, affective, lifestyle, and antisocial. Correlations between all variables were examined to check for multicollinearity, especially because of the concern that the four individual facets would be highly correlated with one another. All correlations were low to moderate (none over 0.5). The bell-shaped trajectory had the lowest rate of offending and was typically least likely to be associated with different risk factors and therefore was used as the reference category. In the first regression model in Table 5.5, as scores on the four factor model increased, the odds of being in the HRC trajectory increased (OR = 1.17) compared to the bell-shaped trajectory. Four factor model scores were not predictive of membership in the other trajectories. However, offenders who fought on a weekly basis in adolescence were over three times more likely to be in the SRC trajectory compared to the bell-shaped trajectory. In the second regression analysis that examined the three factor model, higher PCL: YV scores again increased the odds of membership in the HRC trajectory compared to the bell-shape trajectory. This analysis indicated that, for the HRC trajectory, the relationship between psychopathy and offending was not simply due to the inclusion of prior offending behavior in the measure of psychopathy. However, as illustrated in the third regression model, the antisocial and lifestyle factors, but not the interpersonal and affective factors, significantly increased the odds of membership in the HRC trajectory compared to the bell-shape trajectory. Interestingly, higher scores on the affective factor of the PCL: YV increased the odds of membership in the slow desister trajectory compared to the bell-shape trajectory. Consistent with the previous two models, individuals involved in weekly physical fights were approximately four times more likely to be in the SRC trajectory compared to the bell-shape trajectory. All other criminogenic risk factors examined were not significant in any of the three models (see Table 5.5).

Table 5.5: Coefficients of risk factors by trajectory group (n = 326)

Covariates	Model 1 SD OR	Model 1 SRC OR	Model 1 HRC OR	Model 2 SD OR	Model 2 SRC OR	Model 2 HRC OR	Model 3 SD OR	Model 3 SRC OR	Model 3 HRC OR
Demographics									
'Other' ethnicity	2.41	0.52	0.63	2.40	0.52	0.66	2.67	0.44	0.63
Female	0.38	**0.20**[*]	**0.03**[***]	0.38	**0.20**[*]	**0.03**[**]	0.46	**0.17**[**]	**0.03**[**]
Measures of psychopathy									
Four factor model	1.00	1.07	**1.17**[**]	.	.	.	.	.	.
Three factor model	.	.	.	1.02	1.08	**1.17**[**]	.	.	.
Interpersonal	.	.	.	.	.	.	0.87	1.01	0.87
Affective	.	.	.	.	.	.	**1.32**[*]	1.00	1.24
Lifestyle	.	.	.	.	.	.	0.99	1.20	**1.47**[*]
Antisocial	.	.	.	.	.	.	0.87	1.07	**1.39**[*]
Criminogenic factors									
Substance use versatility	1.15	1.19	0.90	1.14	1.18	0.90	1.18	1.16	0.88
Age of onset- skip school	1.15	0.96	0.98	1.16	0.96	0.96	1.18	0.98	1.03
Age of onset- trouble	0.91	0.92	0.91	0.91	0.91	0.90	0.88	0.92	0.91
Age sexually active	1.06	1.34	1.11	1.08	1.32	1.05	1.04	1.38	1.21
Positive self-identity	1.01	1.00	1.00	1.01	1.00	1.00	1.01	1.00	1.02
Fighting – weekly basis	1.60	**3.53**[*]	0.68	1.54	**3.73**[*]	0.87	1.65	**3.95**[*]	0.81
Model Fit	-2LL = 448.66, χ^2= 79.5, df = 27, p<.001			-2LL = 456.39, χ^2= 71.8, df= 27, p<.001			-2LL = 428.66, χ^2= 99.0,df = 36, p<.001		

Note: Bell-shape trajectory group is reference category. SD = slow desister. SRC = slow rising chronic. HRC = high rate chronic
[*] $p < .05$, [**] $p < .01$, [***] $p < .001$. All significant OR do not contain '1' based on 95% CIs.

5.4. Discussion

5.4.1. Importance of the Offending Trajectories Identified and Their Similarity to Trajectories in Prior Research

Empirical relevance of trajectory groups is dependent on the extent to which the nature of each group differs from one another (van der Geest et al., 2009). The results of the SPGM analysis in the current study revealed four unique offending trajectories: a bell-shaped trajectory, a slow desister trajectory, a high-rate chronic (HRC) trajectory, and a slow rising chronic (SRC) trajectory. It appeared that two of the groups (HRC and SRC) represented different chronic offending trajectories and the other two groups represented trajectories defined by a desistance process beginning in adolescence or early adulthood. Critics of the SPGM approach (e.g., Skardhamar, 2010) may argue that the four trajectories representing two meta-trajectories (i.e., persistence and desistance) is a function of atheoretical decision making when it comes to model selection. A more plausible explanation is that chronic offending within serious offender samples is a broad category and that there may be different trajectories leading to the same persistent adult offending outcome.

Further, chronic offending may be true for two groups, but one group may still offend in adulthood at a higher rate, thus altering the shape of the trajectory. As evidence of this latter explanation, in the current study the SRC trajectory had a later onset of offending compared to the HRC trajectory; yet the SRC trajectory indicated a higher rate of offending in adulthood (i.e., offending after age 18). This is particularly interesting because very commonly age of onset is considered to represent a 'latent propensity' for offending (Nagin & Paternoster, 2000). As shown in Table 5.2, the HRC trajectory had a significantly earlier age of onset compared to the SRC trajectory, and the age of onset of the SRC trajectory did not differ from the two desistance trajectories. In effect, although age of onset was important for one of the chronic offending trajectories most strongly associated with psychopathy (i.e., the HRC trajectory), there was another trajectory (i.e., the SRC trajectory) that was not characterized by this typical early onset pattern. Individuals described by the two chronic trajectories may experience similar risk factors,

but these risk factors may manifest earlier for those in the HRC trajectory, which helps to explain their earlier onset of offending. Specific to psychopathy, differences in trajectory shape may reflect differences between individuals with primary versus secondary psychopathy. Primary psychopaths are believed to inherit psychopathic traits and thus an earlier onset of antisocial behavior should be expected (i.e., the HRC group). Secondary psychopaths are believed to acquire psychopathic traits through environmental insults, and thus onset of antisocial behavior may be delayed until acquisition of such traits (i.e., the SRC group; see Skeem, Johansson, Andershed, Kerr, & Louden, 2007).

The number and shape of trajectories identified in the current study was typical of most studies that have utilized offender samples (Jennings & Reingle, 2012; Piquero, 2008). SPGM studies using offender-based samples have commonly identified an early and persistent criminal trajectory (i.e., HRCs in the current study) and a trajectory that peaks in mid-adolescence and reaches a near-zero level by early adulthood (i.e., the bell shape trajectory in the current study; Piquero, 2008). Also consistent with prior offending trajectory research was the finding that females comprised only a small percentage (7.75%) of offenders associated with the two chronic offending trajectories (see Fergusson & Horwood, 2002) which meant that identifying differences between chronic female offenders and other female offenders remains challenging (e.g., Andersson & Torstensson-Levander, 2013). The two chronic trajectories provided a clear example of the utility of SPGM. Despite averaging a similar number of total convictions, the shapes of the trajectories of these two groups are quite different (Figure 5.2). In terms of similarities between these two groups, offenders assigned to the HRC and SRC trajectories spent more time in custody, had a greater number of convictions, a greater number of violent convictions, and were more likely to be male compared to the bell shape and slow desister trajectories.

The prevalence of chronic offenders in the current study (HRC = 24.5%, SRC = 19.0%) differed dramatically from the 'severe 5%' group of chronic offenders found in the recent work of Vaughn and colleagues (2011; see also Vaughn, Salas-Wright, DeLisi, & Maynard, 2014). However, the disparate prevalences are perhaps better understood as a function of different sampling strategies rather than as two groups composed of different individuals. The Vaughn et al. (2011; 2014) studies relied on a nationally representative

and generalizable sample that provided confirmation of a severe 5% group of offenders that differed from non-offenders. Expanding on these findings, the current study relied on a large group of chronic offenders that was sufficient for detecting differences between chronic offenders and moderate offenders desisting in adulthood that had previously remained elusive in trajectory studies (e.g., Piquero, 2008) and latent class models (e.g., Andersson & Torstensson-Levander, 2013).

An important caveat of any study that examines the association between specific risk factors and trajectory group membership is that, even if some risk factor increases the likelihood of membership in a particular group, not all offenders with that risk factor will be members of that particular group (Nagin & Tremblay, 2005). Thus, although higher scores on the PCL:YV were associated with the HRC and SRC offending trajectories compared to the bell shape trajectory, not all individuals with high scores on the PCL:YV were guaranteed to follow either of the two chronic offending trajectories. It may not be the case that all or even the vast majority of chronic offenders are also the individuals who comprise the population of individuals with high symptoms of psychopathy (e.g., DeLisi & Piquero, 2011). For example, in their evaluation of Moffitt's (1993) developmental taxonomy, Fairchild, Goozen, Calder, and Goodyer (2013) noted that distinct qualitative differences in the personality profiles of chronic and adolescent-limited offenders do not appear to exist, though the personality profiles of the chronic group tend to be more severe. This is important from a risk assessment perspective because it cautions against making an assumption that all adolescent offenders scoring high on the PCL:YV will continue to offend throughout adulthood.

5.4.2. The Current Study's Contribution to Research on Psychopathy and Offending Outcomes

The focus of research on the intersection of psychopathy and criminal behavior has been primarily limited to studies that utilized the 'next offense' as the dependent variable. While important in theorizing about the utility of psychopathy as a potentially important construct in explaining serious criminal offending, Farrington (2005) advocated that it now was necessary examine the relationship between the psychopathy construct and criminal careers. From a developmental criminological perspective (e.g., Loeber & Le

Blanc, 1990), criminal career parameters are particularly useful for understanding serious young offenders, especially incarcerated offenders, as base-rates of recidivism are high within this population and recidivism can even be associated with desistance (Lussier, McCuish, & Corrado, 2015). However, numerous studies that have utilized various instruments to measure symptoms of psychopathy typically focused on the 'next offense' instead of a fuller account of the offenses that comprise the broader criminal career. Given that base rates of recidivism were quite high among incarcerated offenders, these recidivism studies have inherent limitations in identifying long-term (e.g., chronic) offenders. The purpose of the current study was to expand on the earlier work of Piquero et al. (2012) by using symptoms of psychopathy to predict offending trajectories, rather than vice-versa, while controlling for theoretically relevant criminogenic risk factors. The four trajectories identified in the current study included a high-rate chronic (HRC) trajectory that appeared to begin a process of desistance in adulthood. However, the HRC trajectory comparisons with the slow-rising chronic (SRC) trajectory, which had the highest rate of offending in adulthood, indicated that the crime mix of the HRC trajectory included a higher proportion of violent offenses and more punitive sentences. As anticipated, given the expected relationship between psychopathy and serious criminal offending (Cale, Lussier, McCuish, & Corrado, 2015; Hart, 1998; Porter, Woodworth, Earle, Drugge, & Boer, 2003), the HRC trajectory group had the highest symptoms of psychopathy, assessed using both a four and three factor model of the PCL:YV.

Equally important, the current study indicated that even after controlling for a variety of relevant criminogenic risk factors, both the four and three factor models of the PCL:YV were associated with the most chronic and serious offending trajectory. An important construct validity issue regarding psychopathy and its relationship to criminal offending phenomena, generally, was evident. The socially deviant PCL:YV factors, antisocial and lifestyle, not the affective and interpersonal PCL:YV facets, had the strongest relationship with the HRC group. Accordingly, this finding could be used to support Walters' (2003) and Salekin and Lynam's (2010) perspective that the absence of a specific relationship between core interpersonal/affective symptoms and offending outcomes restricted the utility of the psychopathy construct. It is important to examine this concern further, including whether the non-association between core affective and interpersonal symptoms of psychopathy and chronic offending reflects a conceptual or

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operational measurement weakness of psychopathy instruments such as the PCL-R and its several derivatives including the PCL:YV, used in this study (Kotler & McMahon, 2010).

5.4.3. Core Personality Features of Psychopathy and Offending Trajectories

Analyses examining both short-term recidivism (e.g., Corrado et al., 2004; Walters, 2003) and a longer-term recidivism study (Gretton et al., 2004) have indicated that interpersonal and affective measures are less indicative of recidivism or more prolonged offending compared to lifestyle and antisocial measures. Now that these findings were also evident in this trajectory study suggests the need to focus on explicating with greater specificity the relationship between psychopathy, its different symptoms, and chronic offending trajectories. The central question is whether the prominence of socially deviant PCL:YV factors reflects problems with, as Cooke et al. (2012) described, the map (i.e., the measure), or the terrain (i.e., the psychopathy construct). In effect, Cooke et al. (2012) asserted the need to explore a more comprehensive or detailed mapping of the complex and possible additional domains and related symptoms of the terrain of psychopathy. Lynam (2010) too argued for a more complex domain and symptom mapping of psychopathy utilizing the traditional five-factor/30 facet model of personality, which he asserted was a more theoretically valid basis for the psychopathy construct. This fundamental construct concern, therefore, raised the following two questions regarding this study's key findings. First, are the core affective and interpersonal symptoms long asserted to comprise the essential personality dimension of the construct of psychopathy (i.e., the terrain) simply unrelated to longer-term chronic offending trajectories? Or, is the PCL:YV's overreliance on behavioral markers and limited range of affective and interpersonal symptoms (e.g., Dawson, McCuish, Hart, & Corrado, 2012; Skeem & Cooke, 2010) an explanation for why the affective and interpersonal factors (i.e., the map) failed to distinguish between chronic and non-chronic offending trajectories? Second, why are interpersonal and affective deficits theoretically central to explaining the impact of psychopathy on long-term chronic general offending trajectories in the first place?

With respect to the psychopathy construct generally and the last question more specifically, it is important to review the early research on the prototypicality of different

symptoms of psychopathic personality disturbance (see Cooke et al., 2012; Hoff, Rypdal, Mykletun, & Cooke, 2012; Kreis & Cooke, 2011; Kreis, Cooke, Michie, Hoff, & Logan, 2012) and possible profiles of these symptoms related to certain types of criminal offending patterns. These prototypicality studies identified a broad range of affective symptoms, including a lack of attachment, empathy, caring, and commitment towards others, a lack of remorse, emotional depth, and emotional stability across multiple situations. A broad range of interpersonal symptoms were also identified that included a domineering, antagonistic, insincere, and manipulative interpersonal style that features a focus on self, including entitlement, self-aggrandizing, justification, glibness, garrulousness, and verbosity in interactions with others. Regarding symptom profiles and types of crime, from a criminological theoretical perspective, strong symptoms of callousness towards others combined with a domineering interpersonal style more likely facilitate involvement in violent offenses especially the former symptoms for engaging instrumental violence (Porter & Woodworth, 2006). In contrast, interpersonal and affective deficits, arguably, may be less central to explaining property offenses, especially where interpersonal contact is avoided, and drug trafficking where larger criminal organizations working together benefit over independent entrepreneurs (e.g., Tremblay, Bouchard, & Petit, 2009). Similarly, violations of court orders, one of the more common offenses for adolescent offenders (e.g., Laub & Sampson, n.d.) have appeared to be related to a lack of stake in conformity, impulsivity, drug addiction, homelessness, and a difficulty following direction (Corrado, Cohen, Glackman, & Odgers, 2003; Corrado, Odgers, & Cohen, 2000). In effect, although interpersonal and affective traits may influence involvement in more serious types of violent offending, the influence that these symptoms have on more common, less serious offenses that comprise a large proportion of the crime mix of chronic offenders (see Lussier, McCuish, & Corrado, 2015) may be quite limited. Instead of the expectation that interpersonal and affective traits are necessary components of theories of chronic general offending, it may be more appropriate to incorporate these psychopathy symptoms into theories of desistance. For example, callous/unemotional symptoms may fail to deter offenders from continuing to engage in harmful acts.

Regarding the measurement of psychopathy theme (i.e., the map), it is necessary to more fully explicate the symptoms of psychopathy in order to describe the hypothesized theoretical relationship between psychopathy symptoms and long term patterns of violent

offending. This entails developing a psychopathy instrument that encompasses the full range of interpersonal and affective symptoms associated with psychopathic personality disturbance. Arguably, the mapping of the PCL:YV's affective and interpersonal items (glibness, grandiosity, pathological lying, manipulative, lacks remorse, shallow affect, callous/lack of empathy, and a failure to take responsibility) onto the prototypical symptoms of psychopathy (Cooke et al., 2012; Hoff et al., 2012; Kreis et al., 2011; Kreis et al., 2012), suggests that the PCL:YV does not fully cover the complex multi-domain and related wide array symptom terrain. In contrast, the Comprehensive Assessment of Psychopathic Personality Disorder (CAPP; Cooke et al., 2004), which was constructed based on these prototypicality ratings, appears to include a fuller range of affective and interpersonal symptoms than the PCL:YV. For the current study then, a non-association between interpersonal affective symptoms and chronic offending may also be related to the inability of the PCL:YV to fully capture these symptoms. In effect, there may be chronic offenders with substantial interpersonal and affective deficits that fall outside the scope of the PCL:YV. Sandvik et al. (2012) have shown that the CAPP has high inter-correlations with the PCL-R, suggesting both instruments tap into the same underlying construct. However, the CAPP also diverged from the PCL-R in several critical ways. Most importantly, both qualitative and quantitative comparisons of the CAPP and the PCL-R/PCL:YV indicated that the CAPP was more adept at capturing affective symptoms and de-emphasized antisocial and criminal behavior acts (Dawson et al., 2012; Sandvik et al., 2012). Although the PCL:YV is still considered the gold standard in measuring the psychopathy construct, it is important to not equate the measure with the construct. Nonetheless, the antisocial and lifestyle facets appeared important in explaining the unfolding of the criminal career. The manner in which symptoms associated with these facets act as barriers to desistance should be examined.

5.4.4. Lifestyle and Antisocial Factors in the Unfolding of the Criminal Career

Higher PCL:YV scores on the lifestyle and antisocial facets were both helpful in identifying individuals associated with the HRC trajectory. The importance of the antisocial facet seems obvious since past behavior has long been identified as a strong predictor of future behavior (Robins, 1978). In addition, the possibility of criterion contamination also

may have contributed to this finding because, although the majority of this study was prospective, most adolescents' PCL:YV ratings were assessed at age 15-16 but criminal records were examined from age 12 onward, with onset of offending for most participants occurring around age 14. However, the lifestyle facet did not have the same validity issues and emerged as an important predictor of long-term chronic offending. The items comprising the lifestyle factor (stimulation seeking, impulsivity, irresponsibility, parasitic orientation, lacks realistic goals) certainly appear, according to most individually-focused criminological theories, related both directly and indirectly to continued offending across the life course (e.g., Gottfredson & Hirschi, 1990; Moffitt, 1993). Regarding the direct relationship, the item measuring impulsivity could serve as a proxy for the essential part of the key criminological construct of low self-control (DeLisi, 2009). A parasitic orientation would also seem to drive an offender's involvement in financially-motivated crimes. Desistance for this type of offender would seem possible only in the event that the offender developed non-criminal methods of getting others to provide financial support. Highly irresponsible individuals typically have difficulty following rules, implying proneness to violating court-orders. These individuals would likely show low stake-in-conformity, and thus traditional turning points like employment (Laub & Sampson, 1993) may do little to promote desistance amongst this type of individual. Forth et al. (2003) argued that stimulation seeking individuals were prone to extensive and versatile substance use. Property crimes are not an uncommon means to sustain this drug-using lifestyle, particularly for individuals with high levels of irresponsibility and unrealistic goals. Whether specific symptoms of psychopathic personality disturbance are more strongly associated with specific types of offending is a key theme that should be addressed in future research.

5.4.5.   Implications for Offender Assessment

Effectively responding to the small group of offenders responsible for the majority of all crime remains challenging because these offenders typically have personality features, such as psychopathy, that pose significant barriers to interventions that help promote desistance (e.g., Caldwell, Skeem, Salekin, & van Rybroek, 2006). Early childhood intervention programs represent an alternative to the more reactive-based treatment and incarceration approaches that have resulted in less than favorable outcomes with adolescent populations (e.g., Frick, 2009; Frick & Ellis, 1999). The

effectiveness of early intervention programs can potentially be improved through assessments that help to identify the appropriate program for individuals with features of psychopathy. This consideration must be balanced with concerns that have been raised over the appropriateness of labeling a child or adolescent as a 'psychopath' (Edens et al., 2001; Hart, Watt, & Vincent, 2002). The most successful early interventions for the types of individuals in the HRC and SRC trajectory groups require an awareness of risk factors from multiple domains (Frick & White, 2008).

One instrument that has been designed specifically for serious and violent offenders and can aid in promoting the identification of risk factors from multiple domains is the Cracow Instrument (Corrado, Roesch, Hart, & Gierowski, 2002). The Cracow Instrument includes risk factors that have been identified to be important at different developmental stages that will allow for individual-specific interventions at the individual, familial, and community level (e.g., Corrado et al., 2002; Lussier, Corrado, Healey, Tzoumakis, & Deslauriers-Varin, 2011). These interventions are expected to be helpful in targeting factors contributing to an offender's risk for offending. By reducing these factors, individuals may be more likely to benefit from turning points thought to typically only benefit adolescent-limited offenders (Moffitt, 1993). Interventions for offenders are particularly important given that this group is also more likely to experience health problems that contribute to public health costs (Vaughn, Salas-Wright, DeLisi, & Piquero, 2014). If death is particularly likely for individuals with high symptoms of psychopathy, especially lifestyle-type symptoms, then failure to account for health or an early death may lead to an increased likelihood that individuals with high symptoms of psychopathy are found to be false desisters. Future research should examine whether early death or debilitating health outcomes are impacting the relationship between psychopathy and involvement in a chronic offending trajectory.

5.4.6. Limitations

The current study as well as many others failed follow sample members passed their thirties (Piquero, 2008). Additionally, because the current study relied on a sample of individuals who had all committed crimes in adolescence, any existence of an 'adult-onset' trajectory group could not be identified. For all but one offender, PCL:YV assessments

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were conducted after the age of twelve, which was when measurement of offending trajectories began. Jones and Nagin (2007) emphasized that risk factors should be measured prior to trajectory measurement, a principle that was violated in the current study. However, at least conceptually, symptoms of psychopathy are expected to emerge much earlier than age 12. In fact, assessment of psychopathy emphasizes that symptoms are not simply present in the recent past but rather are stable across multiple life domains. Early childhood assessments of callous-unemotional traits and other symptoms of psychopathy indicate it is rare for individuals to have high symptoms of psychopathy in adolescence but not in adulthood (Lynam et al., 2007, 2008; Obradovic et al., 2007). Therefore, even though the current study involved the assessment of psychopathy *after* measurement of offending, it is quite likely that these symptoms emerged *prior* to offending onset (save for the antisocial facet). Although the current study violated Jones and Nagin's (2007) recommendation, the use of Cooke and Michie's (2001) three factor model (which excludes the antisocial facet) helped to avoid tautological issues. Yet, the issue of the PCL:YV's emphasis on delinquent, criminal, and antisocial behavior remains (Cooke et al., 2004; Dawson et al., 2012). Future research may consider using other measures of psychopathy, such as the *Comprehensive Assessment of Psychopathic Personality* (CAPP). The CAPP includes 33 symptoms that are intended to encompass personality rather than antisocial characteristics of psychopathy (Cooke et al., 2004).

Although psychopathy is one of the strongest predictors of both adolescent and adult offending, not all adolescents scoring high on measures of psychopathy were chronic offenders, nor were all adolescents scoring low on measures of psychopathy non-frequent offenders. Moffitt (1993) hypothesized that the trajectories of life course persistent offenders were best explained through a combination of interpersonal deficits and negative family environment. As such, to better explain differences between chronic and non-chronic offenders, future research should incorporate (a) other interpersonal deficits in addition to psychopathy, and (b) negative familial outcomes such as abuse, substance abuse, mental health issues, and criminal behavior. The relative contribution of psychopathy, controlling for interpersonal deficits and negative familial outcomes, should be examined along with interaction and mediating effects (e.g., DeLisi, Peters, et al., 2014; Flexon & Meldrum, 2013). Thinking specifically about desistance, further theorizing regarding the manner in which symptoms of psychopathy act as barriers to desistance

may be helpful for developing more specific intervention and treatment programs to promote desistance amongst this group showing risk for continued offending in adulthood. For example, the lifestyle facet of the PCL:YV shows a clear need to address impulsive decision making and sensation seeking behaviors. Similarly, implied by an individual's interpersonal and affective deficits is a need for addressing motivations for crimes and providing alternatives to seeking to interpersonally dominate others.

Finally, the use of official data may also increase the prevalence of false desisters (Farrington, Ttofi, Crago, & Coid, 2014), though the lack of self-report offending measures into adulthood in the current study meant that there was nothing in the data that could help establish which desisters were false desisters. A way forward for future research is to examine whether individuals with high symptoms of psychopathy are particularly adept at avoiding police detection, thus representing a type of 'false desister'. Yet, in self-report surveys these same individuals also may be more likely to purposefully under-report the level of their involvement in criminal behavior. Further, serious offenses are the most likely to be purposefully under-reported in self-report surveys (Stouthamer-Loeber, Loeber, Stallings, & Lacourse, 2008), and individuals with psychopathic personality disturbance are most likely to be consistently involved in these types of offenses. Therefore, self-report surveys may actually have difficulty accurately capturing the rate and severity of offending patterns of individuals with psychopathic personality disturbance. Nevertheless, a research design that includes both official and self-reported offending will facilitate a more complete exploration of this theoretically complex relationship.

5.4.7. Conclusions and Future Research

Many studies have found a relationship between psychopathy and offending, and in that respect, the current study is no different. What the current study does have to offer, however, is an additional perspective on how individuals associated with a chronic offending trajectory can be differentiated from individuals associated with a desistance trajectory on the basis of scores on the PCL:YV. By presenting this perspective, three conceptual issues related to criminal trajectory research were addressed. First, using a Canadian sample of individuals who had all been incarcerated in adolescence meant that there would be sufficiently high base rates of individuals associated with a chronic offender

trajectory. This facilitated the types of multivariate analyses needed to examine whether risk factors differentiated trajectories that desisted versus persisted through mature adulthood. Second, compared to behavioral and attention disorders that are predominant amongst most adjudicated adolescent offenders (e.g., Forth, 1995; Gretton et al., 2004), measures of psychopathy provided the necessarily precise neuropsychological deficit needed to identify individuals less likely to experience/benefit typical turning points associated with desistance. Third, unlike childhood risk factors that have a more temporaneous or distal impact on offending, such as parental attachment (e.g., Chung et al., 2002; Losel & Bender, 2003), symptoms of psychopathy in adolescence are relatively stable across the life course (Lynam et al., 2007; Obradovic et al., 2007; Salihovic et al., 2013) and thus likely proximally related to negative outcomes across all life stages, including adulthood (Salekin, 2008).

The current study was a necessary initial step in explicating the relationship between psychopathy and criminal careers (see also Piquero et al., 2012). Very importantly, higher scores on the PCL:YV's three and four factor model were associated with chronic general offending even after controlling for several key criminogenic risk factors. Given the paucity of research on this theme, this study's results have several theoretical implications and related future research questions. Specifically, interpersonal and affective symptoms possibly are more appropriate in explaining persistent involvement in violent or other serious offenses compared to involvement in chronic but relatively ubiquitous offenses. There is also a need to explore more fully the extensive theorizing and research concerning comorbidity, especially given the more recent related research on genetics, epigenetics, and the more complex developmental models of personality across the life-course e.g. (DeLisi & Vaughn, 2014, 2015; Sevecke & Kosson, 2010; Viding & Larsson, 2010).

Chapter 6.

Using Duration of Incarceration to Approximate Serious Offending Trajectories

6.1. Introduction

The current study will address problems in three areas of research: (1) difficulties accurately modeling offending trajectories due to the imperfect manner in which exposure time is accounted for (or not accounted for at all), (2) how to define and measure offending severity, and (3) identifying factors that increase the likelihood of a more serious criminal career. The first area will assess the extent to which trajectories can be modeled accurately using a popular statistical package (Proc TRAJ) when offenders within the sample have spent a substantial period of time in custody. This statistical technique has grown in popularity in recent years (Jennings & Reingle, 2012; Piquero, 2008), and so it is especially important to consider how limitations of the technique might affect the testing of different criminological theories. Of specific concern is the manner in which Proc Traj accounts for exposure time, which refers to the amount of time an individual spends in the community and free to commit new crimes. This measure is referred to as an offset variable that is meant to allow for comparisons to be made in terms of the frequency in which individuals offend when these same individuals spend different lengths of time incarcerated (Nagin, 2005). Within trajectory research, controlling for exposure time ensures that offenders with serious risk factor profiles and involvement in offending across the life course are not assigned to a trajectory characterized by a low rate of offending or desistance. Failure to account for exposure time therefore increases the risk of Type II error.

Regarding the second research area that this study will address, part of the goal of examining offending trajectories is to identify which individuals are the most serious offenders that require more intensive methods of intervention. As shown in Chapter Five, the most chronic offenders are not necessarily involved in the types of offenses that are of greatest concern to the criminal justice system (e.g., violent offenses, major property or

drug offenses). In other words, offending frequency is just one element of the background of the most concerning types of offenders. This study will use incarceration time as a measure of the severity of an individual's offending pattern. By utilizing incarceration time as the outcome of interest as opposed to an offset variable, this study avoids challenges associated with accounting for exposure time. The third area of research, and very much related to the second area, deals with the need to understand adolescent characteristics associated with continued involvement in serious offenses during adulthood. In an effort to better understand the serious offender, the current study will use symptoms of psychopathy as measured by the Psychopathy Checklist: Youth Version (Forth, Kosson, & Hare, 2003) as well as a series of other risk factors measured in adolescence from within a variety of domains of functioning, in order to give treatment providers an indication of the types of offenders that should be of greatest concern to the criminal justice system in terms of the development of a serious criminal career.

6.1.1.   The Importance of Exposure Time in Trajectory Research

Although accounting for exposure time is an essential component of research on offending trajectories, often such studies fail to incorporate exposure time as part of model estimation (see Piquero, 2008). Failure to incorporate exposure time when modeling trajectories, or failure to *adequately* incorporate exposure time into trajectory analyses, leads to three research design limitation themes. First, failure to account for exposure time threatens internal validity by creating problems with (a) accurately identifying the prevalence of persistence/desistance and (b) identifying risk factors associated with serious offending. Second, these internal validity issues create a chain reaction that leads to researcher mis-specification of broader theoretical and policy issues. Third, even when exposure time is accounted for, existing statistical packages designed to model offending trajectories have shown a limited ability to accurately account for the amount of exposure time an offender has in the community.

Beginning with the first theme, in their analysis of data on serious offenders from the California Youth Authority study (*n* = 272), Piquero et al. (2001) demonstrated that failure to account for exposure time artificially inflated the proportion of offenders appearing to desist from offending during adulthood. Based on their analysis of offending

outcomes between 18 and 33, Piquero et al. (2001) observed that the proportion of offenders associated with a desistance trajectory was over-estimated by 20% when not accounting for exposure time. In other words, approximately 20% of this sample appeared to be infrequent offenders involved in serious offenses. In a study similar to Piquero et al. 2001), Eggleston, Laub, and Sampson (2004) used data from the Gluecks' Unraveling Juvenile Delinquency study to examine the impact of controlling for exposure time on offending trajectories. Eggleston et al. (2004) observed that the type of trajectory that an individual was assigned to varied depending on whether exposure time was accounted for in their model. Eggleston et al. (2004) also found that failure to account for exposure time resulted in earlier estimations of when desistance actually occurred.

In addition to these two studies, conceptually, the effects of failing to account for periods of incarceration are likely magnified by the typical methods used when performing semi-parametric group-based modeling (SPGM). Specifically, SPGM requires specification of the functional form of each trajectory, and quadratic functional form is often used (Bushway, Thornberry, & Krohn, 2003; Jones, Nagin, & Roeder, 2001; Nagin, 2005). However, quadratic functional form is unable to account for an offender's re-involvement in offending after a lengthy period of non-offending. By way of illustration, if an offender's individual trajectory is characterized by a high level of offending but due to incarceration subsequently does not offend or offends at a reduced frequency, any reversion back to a high frequency of offending cannot be captured if quadratic functional form is specified. In other words, quadratic functional form can capture the rise in this trajectory and subsequent decline, but cannot capture the individual's re-involvement in offending. At least conceptually, if exposure time was accounted for, this reduced level of offending due to incarceration would not result in a dramatic decline in the frequency of offending per person-period observation, and thus the offenders chronic re-offending would be captured by the trajectory model.

Regarding the second theme, by not accounting for exposure time, some researchers appear to have reached incorrect conclusions about the validity of certain theoretical perspectives. For example, Sampson and Laub (2003), two of the biggest critics of the notion of 'life course persistent offenders' and developmental criminology, used data from the Glueck's Unraveling Juvenile Delinquency study to examine offending

trajectories through age 70. This study is notable because of the weight the authors gave their findings despite failing to account for exposure time beyond age 32 (i.e., for 40 years of the study) [25]. Based on this data, Sampson and Laub (2003) concluded that there was no evidence for Moffitt's (1993) notion of life course persistent offenders. They also used their findings to discredit developmental criminology theoretical perspectives; specifically, they argued that their findings indicated that childhood and adolescent development were uninformative of offending outcomes in adulthood (Sampson & Laub, 2003). In contrast, Blokland, Nagin, and Nieuwbeerta (2005) did account for exposure time throughout their study period and found a group of offenders that continued to offend at a high rate through age 70, in line with Moffitt's (1993) notion of life course persistent offenders.

There are two interrelated reasons that explain why Sampson and Laub's (2003) failure to account for exposure time biased their findings in favor of rejecting developmental criminology perspectives. The first reason is related to the magnitude of the effect of failing to account for exposure time, which was exacerbated due to the nature of their sample (see Blokland, Nagin, & Nieuwbeerta's (2005) comparison of their Dutch sample to Laub and Sampson's (2003) Glueck sample). Compared to community samples, a greater proportion of individuals in offender samples come into conflict with the law and a greater proportion also receive custody sentences. As such, offender samples will be more seriously impacted by the failure to account for exposure time. As an illustration of the amount of time members of the Glueck sample likely spent incarcerated, around the time of Sampson and Laub's data collection, 25% of convictions within the state of Massachusetts were responded to with a custodial sentence (Snell, 1995), and 90% of these custody sentences spanned at least one year (Snell, 1995). From the 1920s through the 1980s, the median sentence length in Massachusetts ranged from 16 to 33 months (Cahalan & Parsons, 1986). Moreover, the above statistics were based on the 'average' offender whereas members of the Glueck sample were described by Laub and Sampson (2003) as being more serious/frequent offenders than the typical offender in Massachusetts. Considering that prior record is as an aggravating factor during sentencing (Clancy, Bartolomeo, Richardson & Wellford, 1981), offenders from the Glueck sample were (a) more likely to receive a custody sentence and (b) more likely to receive

[25] There is actually no evidence to suggest that Sampson and Laub's (2003) analysis of offending trajectories from 12 to 72 accounted for exposure time during any age period.

custody sentences that were longer than average. With this latter point in mind, it is virtually impossible for a chronic offender to not have periods of 'inactivity' during their criminal career. At some point they are going to receive a relatively lengthy custodial sentence that creates a period of inactivity. For example, if an offender has a history of serious or violent offending and is involved in even relatively common offenses such as unarmed robbery, Massachusetts Sentencing Grids specify that this offender is to receive a custody sentence between five and 7.5 years (Massachusetts Court System, 2016). Thus, looking back at the Glueck sample, it is likely that a substantial proportion of offenders spent lengthy periods of time in custody that resulted in offending inactivity. Since Sampson and Laub (2003) did not measure exposure time after age 30, assignment to a desistance trajectory was likely for offenders involved in serious offenses.

Regarding the second issue biasing Sampson and Laub's (2003) findings, the impact of their failure to account for exposure time was likely exacerbated by the statistical procedure they used when modeling offending trajectories. Although Sampson and Laub (2003) did not explicitly state the type of functional form they specified when modeling their offending trajectories, the shapes of their trajectories provides strong evidence that they selected quadratic functional form[26]. Very importantly, as discussed above, quadratic functional form cannot account for patterns of re-offending after lengthy periods of inactivity (Bushway et al., 2003). Therefore, offenders in Sampson and Laub's (2003) sample receiving lengthy periods of incarceration may re-offend after release, but this re-offending pattern was unlikely to be captured by their trajectory analysis. As a consequence, these offenders would appear to remain inactive during and after incarceration. This inactivity was not due to desistance but rather a product of (a) the lack of opportunity to offend as a result of being incarcerated and subsequently (b) the inability to account for re-offending due to model mis-specification. Trajectories characterized by 'desistance' will therefore contain offenders that are still offending (see Eggleston et al., 2004; Piquero et al., 2001). This will make it difficult for studies to identify both risk factors for persistence and protective factors for desistance. The failure to control for exposure time is therefore not simply a matter of under-estimating the prevalence of persistence; it

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[26] Had they selected cubic functional form, which is necessary to capture the re-offending after a period of incarceration, the trajectories would have been characterized by a small up-tick at the end (see Bushway, Thornberry, & Krohn, 2003 for a discussion).

is also a matter of creating unreliable tests of different theories of persistence and desistance.

Regarding the third theme, even when exposure time is accounted for, the typical analytic strategy for modeling offending trajectories, Proc TRAJ, (see Piquero, 2008), has shown limited ability to accurately classify to the appropriate trajectory those offenders that spend lengthy periods of time in custody. Specifically, even if exposure time is accounted for, Proc TRAJ is unable to accurately model trajectories due to a subgroup of offenders that have inordinate rates of offending during a particular person-period observation as a result of being convicted of several crimes and then spending a lengthy period of time incarcerated[27] (see van der Geest et al., 2009). Van der Geest et al. (2009) noted that an adjustment must be made to the Proc TRAJ analysis which involves purposefully underestimating the amount of time offenders spend in custody. This adjustment helps avoid creating inordinate levels of offending among individuals receiving lengthy sentences, which in turn helps more accurately model offending trajectories (see Chapter Five; Cale, Smallbone, Rayment-McHugh, & Dowling, 2015; Lussier, van den Berg, Bijleveld, & Hendriks, 2012). However, as a consequence of this adjustment, offenders that spent an entire age-period in custody are treated as still spending some time in the community, usually a minimum of 20 percent of the age-period (see Chapter Five). Therefore, despite reality, an offender will appear to be exposed to the community and not offend. Blokland, Nagin and Nieuwbeerta (2005) also recognized this issue in their examination of a Dutch conviction cohort. However, individuals incarcerated for six months or more in a given person-period observation were simply excluded from the analysis at that particular period (i.e., their level of offending was coded as missing). Sampson, Laub, and Wimer (2006) used a similar solution when members of the Glueck sample spent an entire person-period observation incarcerated. A potential unintended effect of this procedure is that the most concerning offenders are not considered when modeling offending trajectories.

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[27] By way of illustration, an offender participates in a crime spree one month after their birthday. The offender is convicted of ten offenses and sentenced to two years in custody. For that first year of custody, if exposure time is accounted for their offending rate will be prorated to approximately 125 convictions for that person-period observation.

In Chapter Five, individuals associated with a chronic offending trajectory were also associated with a crime mix that was dominated by involvement in relatively non-serious offenses. In contrast, some offenders involved in serious offenses were incarcerated for a substantial length of time, received adjustments to their level of exposure time that reflected greater exposure to the community, and as a consequence were likely classified to a trajectory characterized by desistance at the end of adolescence or beginning of adulthood. In effect, due to limitations of the dominant statistical package used to model offending trajectories, issues associated with studies failing to account for exposure time are also issues within studies that do account for exposure time. The current chapter avoided all three abovementioned issues. Instead of building a measure of exposure time into the Proc TRAJ analysis, which would be subject to the third limitation theme, months incarcerated per person-period observation was used as the specific unit of analysis (e.g., as opposed to the traditional approach of measuring convictions for each person-period observation). Based on the assumption that incarceration would be associated with more serious offenders, of interest was whether symptoms of psychopathy would be a strong indicator of membership in the trajectory characterized by the greatest amount of time spent incarcerated. Of additional interest was whether individuals associated with this trajectory were also the most frequent offenders, or whether this trajectory would also be comprised of individuals involved in relatively fewer offenses compared to other trajectories, but whom were involved in violent or other serious offenses that warranted receiving sentences specifying lengthy periods of incarceration. This latter line of analysis will be informative of the prevalence of false desisters, meaning those who do not offend due to inopportunity created by incarceration. First, the importance of offending severity to criminal career research is discussed. Second, attention is given to how incarceration and involvement in serious offenses will act as a barrier to desistance. Third, the expected relationship between psychopathy and greater length of time incarcerated is outlined in greater detail.

6.1.2. The Importance of Offending Severity and Methods of Measurement

Studying offending severity is important for understanding the development of offending pathways (Loeber & Hay, 1994). Individuals rarely begin with serious offenses

and then de-escalate to less severe crimes (Farrington, 1986; Le Blanc & Frechette, 1989; Le Blanc & Loeber, 1998). Despite criminologists generally agreeing on the meaning of offending severity (Warr, 1989) and the importance of offending severity to the development of offending (e.g., Le Blanc & Loeber, 1998; Loeber & Le Blanc, 1990), there is much uncertainty regarding the most appropriate method of measuring this aspect of an offender's criminal career (Ramchand, MacDonald, Haviland, & Morral, 2009). Although there is widespread agreement that not all offenses are of equal severity, there is substantial disparity regarding *which* offenses are more or less serious (Ramchand et al., 2009). Ramchand et al. (2009) attempted to determine a hierarchy of offense severity through a presumption that more serious offenses always followed less serious offenses; therefore, offenders' offending sequences could be used to define the severity of different crimes. However, this approach assumes rather than demonstrates that offenses progress in order of severity. The logic of this approach is essentially the inverse of the approach used by developmental criminologists (e.g., Loeber & Hay, 1994). Ramchand et al.'s (2009) approach is also tautological. If the purpose of studying offending severity is to understand the progression of crime (Loeber & Hay, 1994; Loeber & Le Blanc, 1990), the progression of crime cannot be used to define offending severity (i.e., the definition of offense severity cannot rely on the offending patterns that it seeks to predict). Therefore, it is necessary to ensure that offending severity not defined by the outcome that the measure is intended to help explain.

An alternative to Ramchand et al.'s (2009) approach involves developing scales that make assumptions about the severity of types of offenses (e.g., violent, property, drug crime). These scales are most commonly constructed on the basis of public perceptions (Ramchand et al., 2009) and have been criticized on several grounds (see Warr, 1989). For one, perceptions of severity may vary according to group attitudes of what is right versus wrong and thus inherent to severity scales is an element of subjectivity. As well, assessing the severity of an offense requires the balancing of two components: wrongfulness and harmfulness (Ramchand et al., 2009; Warr, 1989)[28]. Wrongfulness describes the moral blameworthiness of the action and the person associated with that

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[28] A third component examined in some research includes the economic costs associated with the crime (Cohen, 1988), though this component is more a description used to determine severity for the criminal justice system as opposed to severity of a specific offender.

action. Harmfulness describes the extent of the consequences of the action to the victim or victims (Warr, 1989). Although the latter may allow for more consistent evaluations of severity across offense scenarios, wrongfulness can very clearly differ not only by the nature of the offense but by the nature of the offender. For example, youth offenders are typically designated as being of lesser moral blameworthiness than adults; however, such nuances have not been captured within existing scales designed to measure offending severity. Warr (1989) noted that most scales have only captured the harmfulness component of severity and will often even use the terms harmfulness and severity interchangeably (Warr, 1989).

More broadly, many offense severity scales emerging from forensic psychology lacked the nuance necessary to capture how within-category differences in offense severity affect between-category comparisons (Ramchand et al., 2009). For example, violent offenses were assumed to be more serious than property offenses, but this assumption ignores within-category variation in offense severity across the two offense categories. The most minor violent offense may be less serious than the most major property offense. Sellin and Wolfgang (1964) attempted to address the problem of using broad crime categories to define offense severity by asking a sample of university students to respond to over 100 real crime event scenarios[29] described by Philadelphia police departments. Students were asked to rank scenarios on the basis of their perceived severity. Providing specific scenarios helped to distinguish between the severity of different crimes categorized within different types of offenses, and this approach has become the dominant method of determining offending severity (Ramchand et al., 2009).

However, the Sellin-Wolfgang scale and others like it relied upon public perception to define offense severity (e.g., Wolfgang, Figlio, Tracy, & Singer, 1985). Public perceptions were more recently shown to poorly differentiate between normative and non-normative behavior in evaluations of severity despite the latter being, at least conceptually, more serious. For example, according to public perceptions in Wolfgang et al. (1985), adolescent marijuana use is a particularly serious offense, at least more serious than

[29] Lynch and Danner (1993) argued that the scenarios over-simplified decisions about the severity of an offense. For example, although participants may be able to interpret the harmfulness component of the scenario, too much inference is required to interpret the wrongfulness component of the scenario.

instances of theft, despite marijuana use being a relatively normative adolescent behavior (Ramchand et al., 2009). This example illustrates that public consensus will not necessarily reflect potentially more accurate theoretical descriptions of behavioral severity. Certain sects of the population appear particularly ill-equipped to differentiate the moral blameworthiness (i.e., the wrongfulness) of actions and actors. From a theological point of view, some in the public believe that only God has the authority to assign moral blameworthiness and thus this section of the public determines offending severity solely on the basis of the perceived harmfulness of the offense (Warr, 1989). Remaining within a theological point of view, others believe that there are no shades of gray when assessing the morality of an action; behavior is either moral or immoral (Warr, 1989). As a consequence, differences in the wrongfulness of different offenses will not be captured in questionnaires administered to this section of the population.

To address prior limitations associated with offense scales, Kyvsgaard (2003) assessed severity by examining the length of time an offender spent incarcerated for a specific offense, which was argued to provide a more objective measure of severity. Through this conceptualization, public biases and determinations of severity that discount or improperly consider moral blameworthiness are also avoided. In contrast to traditional approaches, determining the amount of time that an offender should be incarcerated requires balancing the wrongfulness and harmfulness of an act. For example, decisions concerning the duration of an incarceration sentence requires that the judge weight both the harm to the victim and the wrongfulness of the offense. This latter component is captured by considering the moral blameworthiness of the offender. For example, in Canada, there is specific legislation designating young offenders (*Youth Criminal Justice Act*, 2002), Aboriginal offenders (Brzozowski, Taylor-Butts, & Johnson, 2006), and individuals with fetal alcohol spectrum disorder[30] (Chartrand & Forbes-Chilibeck, 2003; Department of Justice Canada, 2016; Douglas, 2010) as being of lower moral blameworthiness than the general population due to a variety of background circumstances at the individual and cultural level (Corrado & Mathesius, 2014). Through the inherent weighting of both wrongfulness and harmfulness in the determination of sentence length, the use of incarceration may be a more accurate approach to capture

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[30] At times; however, fetal alcohol spectrum disorder can be used as an aggravating factor during sentencing (Department of Justice Canada, 2016).

offending severity. This was the accepted rationale in the current study, and thus duration of incarceration served as the indicator of the severity of an offender's criminal career.

6.1.3. Incarceration as a Barrier to Desistance

Increases in offense severity is a concern for intervention and treatment providers because it marks a disassociation with community norms and a loosening of informal social controls (Loeber, Stouthamer-Loeber, van Kammen, & Farrington, 1991), both of which are helpful for promoting desistance (Laub & Sampson, 2003). Similar to the concept of cumulative disadvantage (Sampson & Laub, 2005), increases in crime severity will in turn create increased conflict with age-graded social controls (e.g., caregivers in childhood, school in adolescence, employment and relationships in adulthood). Therefore, lengthy periods of incarceration may act as a barrier to desistance. There is a well-established body of literature connecting (a) incarceration to unemployment (e.g., Fagan & Freeman, 1999; van der Geest, Bijleveld, Blokland, & Nagin, 2016; Western, Kling, & Weiman, 2001), and (b) employment to desistance (Laub & Sampson, 2003; Uggen, 2000; Warr, 1998). These two areas of research imply a reciprocal relationship between crime and unemployment. For example, Sampson and Laub's (1993) discussion of state dependence described how incarceration negatively impacted ties to sources of informal social control and also prevented the acquisition of new forms of informal social control and social capital that are helpful for gaining employment.

The effect of youth incarceration on unemployment has particularly concerning long-term consequences (Fagan & Freeman, 1999). Using longitudinal data from the Netherlands, van der Geest et al. (2016) showed that over a ten year period, offenders that were incarcerated spent less time employed and were less likely to have any employment compared to non-incarcerated offenders. However, using SPGM to model employment trajectories, van der Geest et al. (2016) also found that the effect of incarceration on reducing the likelihood of subsequent employment was strongest for individuals associated with a trajectory characterized by relatively normative levels of employment. In other words, offenders already characterized by low levels of employment were not affected by incarceration. Van der Geest et al. (2016) proposed that these low levels of employment were due to selection effects, where such offenders were so unlikely

to be employed due to underlying risk factors (and the highest levels of incarceration) that there was no independent effect of incarceration on employment. Instead, incarceration appeared to have the most deleterious effects for the types of offenders with the most to lose (e.g., former offenders that may have moved on from a life of crime but caught a 'snag' in the desistance process). Skardhamar and Savolainen's (2014) examination of the role of employment in influencing desistance amongst recidivists in Norway in fact showed that for most offenders, employment is a *consequence* of desistance. The policy implication here is that (a) for offenders with personal qualities suitable for employment, incarceration will act as a barrier to obtaining this type of informal social control specified as important for desistance (e.g., Sampson & Laub, 1993) and (b) for some offenders, because of selection effects traditional theories may be ineffective in identifying factors necessary for desistance.

6.1.4. Explicating the Relationship between Psychopathy and Incarceration

The tendency for psychopathy to be associated with both frequency of offending (e.g., Chapter 5) and violent offending (e.g., Hart, 1998), including more serious forms of violence (Hare, 1981) implies that psychopathy will also be associated with lengthier periods of incarceration. In fact, psychopathy is likely more informative of length of incarceration than frequency of offending. This is because other risk factors not necessarily associated with psychopathy, such as persistent drug addiction or low self-control, are more likely to contribute to involvement in frequent offending compared to serious offending (Corrado et al., 2015). However, whether psychopathy is associated with longer periods of incarceration remains empirically unexplored, though the related theoretical literature is evidence that psychopathy may increase sentence length in a couple of ways.

First, there is evidence that individuals with psychopathy will receive lengthier sentences due to both general offending patterns as well as specific circumstances associated with individual offenses. Regarding general offending patterns, in an examination of 87 male offenders incarcerated at a medium security facility in Canada, Serin (1991) found that those scoring over one standard deviation above the mean on the

PCL (a score of 28) were not just involved in a greater number of violent offenses, they were also more likely to have violent offenses comprise a larger proportion of their total number of offenses, showing a specific propensity towards violence specialization. This increased likelihood of involvement in more violent (i.e., more serious) offenses implies lengthier periods of incarceration. Second, the circumstances associated with the offenses of individuals scoring high on measures of psychopathy are likely to differ from the circumstances of offenses of other individuals. In both self-report and laboratory settings, higher scores on measures of psychopathy increased the likelihood of an instrumental act of aggression. Instrumental aggression is typically pre-planned, committed against a stranger, and often results in more serious harm to the victim (Cornell et al., 1996; Glenn & Raine, 2009; Reidy, Zeichner, Miller, & Martinez, 2007). It also appears that certain symptoms, specifically interpersonal and affective deficits, are more conducive to involvement in instrumental forms of violence (Glenn & Raine, 2009). Taken together, given the tendency for the courts to respond more punitively to instances of violence and to instrumental offenses that are pre-planned and cause more harm to the victim (Clancy et al., 1981), it follows that individuals with psychopathy are more likely to spend more time incarcerated.

6.2. Study Aims

Serious offending trajectories were defined by length of incarceration at each age between 12 and 28. As discussed in greater detail in the analytic strategy, it is important to view months incarcerated not as a unit of time but as a unit of severity. Involvement in a more 'serious' offending trajectory could occur in two ways: (1) chronic general offending resulting in multiple instances of incarceration or (2) involvement in a serious offense resulting in a long-term prison sentence. It was especially important for the current study to capture this latter group as central limitations of Chapter Five were the possibilities of (a) 'false desistance' amongst offenders incarcerated for lengthy periods of time and (b) under-estimating the strength of the relationship between psychopathy and long-term offending patterns. In effect, it was hypothesized that a trajectory characterized by lengthy periods of incarceration across adolescence and adulthood would better represent serious and violent offenders as opposed to a trajectory characterized by chronic general

offending. Following the identification of crime severity trajectories, the relationship between symptoms of psychopathy and crime severity was examined, controlling for key covariates. A second line of analysis involved examining the relationship between crime severity and crime frequency.

6.3. Methodology

6.3.1. Sample

Data were used from the Incarcerated Serious and Violent Young Offender Study, which has been ongoing in British Columbia, Canada since 1998. As part of this study, adolescent offenders (age 12-19) were interviewed in open and secure custody facilities within the Greater Vancouver Regional District and surrounding areas. This sample of Canadian incarcerated adolescent offenders is very specific and generalizing the results of the current study to non-incarcerated populations should be done with caution. Additional details of the sampling strategy have been discussed at length in prior publications (e.g., Corrado, Cohen, Glackman, & Odgers, 2003; Corrado, Vincent, Hart, & Cohen, 2004; Chapter Five). Focus within the current study was on a subsample ($n = 326$) of participants assessed using the PCL:YV. Convictions for all offenders were coded until age twenty-eight with the exception of seven percent of the sample who were 27 years old at the time of data collection. For this latter group, convictions and time incarcerated at age 28 were coded as missing. The sample is overwhelmingly composed of male (80.4%) and Caucasian (60.9%) offenders. Offenders were, on average, approximately age 16 at the time of their assessment.

6.3.2. Procedure

The British Columbia Ministry of Child and Family Development is the legal guardian to all youth in custody and provided this project with consent to recruit participants from custody centers throughout the province. Research assistants (RAs) approached youth while on their unit within the custody centre and asked if they wanted to participate in a research study. RAs interviewed participating youth in an isolated interview room to ensure confidentiality. Participants were read and given a copy of an

information sheet explaining the purpose of the study, how information would be collected (e.g. interview and file information), and that all information would be kept confidential unless the participant made a direct threat against themselves or someone else. Participants signed a form signifying that they understood the details of the study, including the fact that they could withdraw their participation at any time. Participants were informed that their involvement or non-involvement in the study would not affect their stay while in custody, nor would it affect decisions made during the court process. To improve the reliability of self-reported information, RAs referred to case management files, which contained participants' presentence reports and information concerning their behavior while in the institution. Access to file information prior to interviews ensured that RAs were aware of discrepancies between interview responses and official records. For the assessment of psychopathy using the PCL:YV, all RAs received training from a certified professional. After training, RAs were paired together to complete inter-rater reliability. The PCL:YV interview was conducted with both RAs in the room and an independent coding of interview and file information followed. This information was used by RAs to complete an independent rating of the 20 PCL:YV items. Inter-rater reliability was high based on an evaluation of a subsample of 30 randomly selected cases (Intraclass Correlation Coefficient = 0.92). Discrepancies in ratings between RAs were addressed before data entry.

6.3.3. Measures

Ethnicity and gender were measured through self-report interviews. For ethnicity, youth were asked to self-report the ethnic group that they most identified with. Youth that reported a Metis background were classified as reporting an Aboriginal background. Although some offenders in the current study were in their early thirties, criminal trajectories were only measured to age 28 and therefore it was unnecessary to control for age in subsequent analyses. Seven types of risk were measured: substance use, school behavior issues, physical and sexual abuse experiences, sexual activity, identity development, residential mobility, and aggression. All measures are outlined below in greater detail and summarized in Table 6.1.

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Psychopathy Checklist: Youth Version (PCL:YV; Forth et al., 2003).[31] The PCL:YV is a symptom rating scale that ranges from 0-2 and is scored by combining information from a 60-90 minute semi-structured interview and a review of file-based collateral information. The 20 items comprising the PCL:YV are believed to represent the fundamental personality and behavioral traits represent the construct of psychopathy in adolescence. These 20 items represent different facets of the underlying psychopathy construct. In terms of the underlying structure of the instrument, Forth et al. (2003) recommended using a four factor model that consists of an interpersonal facet, an affective facet, a lifestyle facet, and an antisocial facet. Cooke and Michie (2001) recommended a three-factor model that excludes Forth et al.'s (2003) antisocial facet based on the rationale that measures of psychopathy should not be defined by the behaviors that the measure is used to predict. Total scores, aggregated factor scores, and individual factors are presented in Table 6.1. Total scores did not differ between males and females. Approximately one third of the sample scored what could be considered 'high' on the PCL: YV (25 or higher).

Criminogenic Risk Factors. Substance use risk factors included separate measures of the age of onset of alcohol and drug use as well as an aggregate scale used to capture severity of self-reported drug use. This scale was comprised of eight dichotomized items (alcohol, marijuana, hallucinogens, ecstasy, cocaine, heroin, crack cocaine, and crystal meth). Scale reliability was high (0.88) based on the tetrachoric ordinal alpha value, which is more reliable than Cronbach's alpha for dichotomous items (Gadermann et al., 2012). School behavior issues included the age at which participants began getting into trouble at school, the age at which they started skipping school, the number of times that they changed schools, and whether they were attending school prior to their incarceration. Abuse experiences included dichotomous self-reported measures of whether the youth had experienced physical abuse and sexual abuse. Sexual activity was measured using one item on the age of onset of consensual sexual activity. Personality development was measured using Schneider's (1990) Good Citizen's Scale, a self-report inventory of 15 identity traits coded on a 1-7 scale (Cronbach's alpha = 0.74),

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[31] The manualized version of the PCL: YV (Forth et al., 2003) was not available when interviews were taking place. The version used in the current study is the same used in Forth (1995). Specific differences between the two versions are described in Vincent et al. (2008).

with all items coded so that lower scores indicated a negative identity. Aggression was assessed by asking participants about the frequency of their involvement in physical fights, whether the participant felt they got angry easily, and whether the participant reported that someone had told them they had a bad temper. To measure familial delinquency and disruption, participants were asked to report whether any of their biological parents or biological siblings had trouble with alcohol or drugs, had experienced physical or sexual abuse, had a criminal record, or had mental illness. These six items were aggregated into a global scale (tetrachoric ordinal alpha = 0.78). Residential mobility measured whether the participant had left home willingly for more than a day to live somewhere else, whether the participant had been kicked out of their home for more than a day, whether the participant was raised by their biological parents, and whether the participant lived in foster care or other forms of ministry care.

Measures of Offending. Offending was measured using official data from British Columbia Corrections' computerized system, Corrections Network (CORNET), which contains information on an offender's movement in and out of custody as well as the exact criminal offense, date of conviction, and sentence type received. Using data from this computerized system, every criminal charge that resulted in a conviction was coded for the entire sample from age 12, the age of criminal responsibility in Canada, to age 28. In line with prior studies measuring offending trajectories, for the seven percent of offenders who had not reached age 27, their offending for age 28 was coded as missing (Eggleston, Laub, & Sampson, 2004; Livingston, Stewart, Allard, & Ogilvie, 2008; van der Geest et al., 2009). Also in accordance with these studies, because 15 offenders died (4.6% of the sample) and ten (3.1%) moved outside the province[32], offending and incarceration outcomes after the age of death or move were coded as missing rather than as 'zero' for these offenders. This approach avoided an artificially high rate of desistance. For this sample, the average number of charges for which the individual was convicted was 23.28 (SD = 17.46). The median number of convictions was 19.5, showing that the high number of convictions was not an artifact of a small subgroup of individuals involved in an inordinate rate of offending. The vast majority of the sample (84.0%) had been convicted of a violent offense. Age of onset, based on age at first court appearance was, on average,

[32] CORNET data includes only offenses committed within the province of British Columbia, convictions incurred in another province were not measured.

fourteen years old. In total, approximately 40 percent of the sample first appeared in court at age 12 or 13 (13.5 % and 27.0 % of the sample, respectively.

Description of Incarceration Patterns. On average, offenders spent 1,166 (SD = 1167) days in custody. The median number of days in custody was 771 and twenty-five percent of the sample spent at least 1,875 days in custody from age 12 to 28. In other words, a quarter of the sample spent five years in custody during adolescence and the beginning stages of adulthood. From age 12-17, 25 different offenders spent an entire age-period in custody (e.g., one offender spent all of age 13 in custody, three offenders spent all of age 15 in custody, etc.). From age 18-28, 89 different offenders spent an entire age-period in custody. Throughout the entire study period (12-28), 99 offenders spent an entire age-period in custody. Altogether, offenders in this sample spent an entire age-period in custody on 221 occasions. Similar to the continuity of high rate offending between adolescence and adulthood (see Chapter Five), 60% of offenders that spent an entire age-period in custody during adolescence also spent an entire age-period in custody during adulthood. In contrast, only approximately 25% of offenders that did not spend an entire age-period in custody during adolescence did spend one full period in custody during adulthood.

Table 6.1: Descriptive information of the sample (*n* = 326)

Individual characteristics	n (%)	Mean (SD)
Demographic Characteristics		
Gender		
Male	262 (80.4)	
Female	64 (19.6)	
Ethnic origin		
Caucasian	196 (60.7)	
Aboriginal	81 (25.1)	
Other	46 (14.2)	
Measures of psychopathy		
Total PCL: YV Score		21.19 (6.37)
Four factor model		19.50 (5.82)
Three factor model		12.41 (4.56)
Interpersonal factor		3.00 (2.04)
Affective factor		4.36 (2.01)
Lifestyle factor		5.04 (2.03)
Antisocial factor		7.09 (2.26)
Criminogenic risk factors- offender		
Age of onset – alcohol use		11.97 (2.14)
Age of onset – drug use		11.75 (2.15)
Substance use versatility scale		4.32 (2.11)
Enrolled in school	161 (50.0)	
Age of onset – skipping school		12.29 (1.98)
Age of onset – trouble at school		9.73 (3.14)
Number of different schools		6.31 (6.17)
Physical abuse	148 (46.5)	
Sexual abuse	72 (22.9)	
Age of onset – sexual activity		13.05 (1.67)
Positive self-identity		71.16 (10.41)
Prosociality		19.06 (4.09)
Obedience		24.53 (5.14)
Hyper-masculinity		19.58 (3.81)
Fighting – weekly basis	82 (28.0)	
Angers easily	176 (56.6)	
Bad temper	234 (74.8)	
Criminogenic risk factors- family		
Family disruption scale		2.76 (1.48)
Left home for 24hr	240 (76.4)	
Kicked out of home for 24hr	141 (45.8)	
Raised by biological parents	203 (65.3)	
Criminal career measures		
Days in custody		1,126 (1079)
Age of onset		14.06 (1.41)
Offending frequency		23.29 (17.46)

6.3.4.   Analytic Strategy

PROC TRAJ for SAS 9.4 was used in the current study to model the severity of an individual's offending trajectory, which requires pre-specification of the distribution of the outcome of interest (months incarcerated over age). It is important to clarify that what is being modeled is not simply the number of times that an individual was incarcerated in a particular year. This type of an approach would likely create 'serious' offending trajectories defined solely by chronic minor offenders frequently moving in and out of custody. The specific aim of this study was to model the severity of an individual's criminal career by capturing within the same trajectory both chronic general offenders as well as infrequent offenders receiving lengthy sentences that preclude movement in and out of custody. The trajectory analysis involved modeling time spent incarcerated over each age. In interpreting this analysis, it is important to not view time incarcerated as a specific unit of time. This is because the amount of time incarcerated is not measured consecutively. Hypothetically, an individual could never be incarcerated for two days in a row over a particular age period yet still spend half of that age period incarcerated. Again, the goal of the current analysis was to capture two types of offenders: the chronic general offender and the non-frequent offender involved in serious crime-types.

There are several challenges to confront before continuing with this line of analysis. In Proc TRAJ, the outcome of interest can be specified as following a zero-inflated poisson (ZIP), logit, or censored normal distribution. Of these distributions, none are a particularly accurate representation of the current study's measurement of offense severity. Although censored normal might appear the most logical choice, the distribution of custody time per age-period was non-normally distributed at each age from age 12-28 as per both Kolmogorov-Smirnov and Shapiro-Wilk tests of normality. A logarithmic transformation of this variable was especially inappropriate given that non-incarceration was frequently observed. Moreover, although technically time incarcerated at each age period must be a censored variable (i.e., length incarcerated cannot exceed one year) censoring impacted only 221 of a total of 5,542 person-period observation points (4.0% of cases), implying that the conceptually restrictive nature of the outcome variable typically did not translate into actual restrictions placed upon the data.

A decision was made to specify a ZIP distribution to model trajectories of offending severity. A count of the number times that an individual spent a month incarcerated per person-period observation was used as the event being modeled[33]. This decision requires some justification and clarification since what is being counted as an event is a measure of time and usually the only measure of time in this type of analysis is when it is used to provide a fixed interval to determine when an event should be counted. Here, it is best not to view 'months' as a conceptualization of time. Each 'month' incarcerated should be viewed as a count of the number of times in a year that an offender was associated with a relatively serious offending pattern. Although the number of months that an offender can be incarcerated per person-period observation is fixed at 12, as noted above, reaching this ceiling was rare. Using a ZIP distribution to model a censored variable is somewhat analogous to prior uses of a ZIP distribution to describe trajectories of offending as measured by censored self-report scales (e.g., Mulvey et al., 2010).

The number and shape of the offending severity trajectories that best fit the data were identified using semi-parametric group based modeling (SPGM; Nagin & Land, 1993). Unlike cluster analysis and other grouping methods that identify groups *ex ante*, the SPGM method allows developmental trajectories to emerge from the data (Nagin, 2005). In this study, trajectories were measured from age 12 to 28. Very important, it was not necessary for the number of months spent in custody to be consecutive. For example, an offender identified as spending four months in custody may have entered custody on five different occasions at various time-points during a particular person-period observation. Unlike typical trajectory analyses, controlling for exposure time was unnecessary. Similar to Chapter Five, the association between trajectories, psychopathy, and criminogenic factors were initially examined in a series of bivariate analyses. All significant criminogenic risk factors and measures of psychopathy were then included in

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[33] By specifying a ZIP distribution, it is important to consider whether the measure of offending severity violated the independence of events assumption. The question to address is whether spending one month in custody increases or decreases the likelihood of spending a second month in custody. If month two was dependent upon month one, then the assumption is violated. However, in this case, an individual does not spend a second month in custody because they spent an initial month in custody. Although both month one and month two may stem from the same sentence, this is no different from an offender receiving two convictions or arrests that stemmed from the same crime event.

\a multinomial logistic regression analysis to examine whether these factors helped predict a particular trajectory pattern of incarceration time.

6.4. Results

6.4.1. Model Identification and Interpretation

The SPGM analysis proceeded first with model identification, which involved identifying the number and shape of the offending trajectories that best fit the data. Trajectory analyses were conducted in SAS 9.4 using the Proc TRAJ add-on developed by Jones and colleagues (2001; see also Jones & Nagin, 2007). A ZIP distribution with quadratic functional form was used to estimate the shape of the offending trajectories and Bayesian Information Criteria (BIC) values were used to identify the number of offending trajectories that best represented the data. A six group quadratic model resulted in a BIC value of -8208, which was closer to zero than both a five group model (BIC = -8986) and a seven group model (BIC = -8294). Jeffrey's scale of evidence based on the Bayes factor approximation was used to determine whether there were substantive differences in BIC values between the four, five, and six trajectory group models (e.g., Nagin, 2005). Jeffrey's scale of the evidence of the Bayes factor is calculated as $e^{\ BICi - BICj}$ where values of B_{ij} greater than ten indicate strong evidence for model 'i' (see Nagin, 2005). There was strong evidence for a six group model over a seven group model ($B_{ij} > 10$) but not for a five group model over a six group model ($B_{ij} < 10$). Additionally, as the difference in BIC values between the six and seven group models was greater than 10, according to Raftery (1995), the posterior odds favoring the six group model would be greater than 150:1, meaning strong evidence for a six group model. The parameters outlined in Table 6.2 help support the retention of a six group model. Classification accuracy based on the average posterior probability of accurately assigning individuals to a particular trajectory was high for all six trajectories (range of 0.85-0.96). Finally, odds of correct classification (OCC) was used to help provide confidence that individuals were assigned to the appropriate trajectory group. OCC values for each trajectory group were calculated as:

$$OCC_g = (AvePP_g / (1-AvePP_g)) / (\textstyle\prod_g / (1-\textstyle\prod_g))$$

where $\prod_g$ is the estimated size of group g (see Skardhamar, 2010).

As indicated in Table 6.2, OCC values for the six trajectories ranged from 5.58-23.48. All values indicated high classification accuracy according to both Nagin (2005) and Skardhamar's (2010) recommendations.

Table 6.2: Fit statistics for zero-inflated poisson model (*n* = 326)

	Offending Trajectories					
	Low Rate	Bell Shaped	EOFD	High Rate Persistent	Low Level Persistent	High Rate Escalating
n (%)	68 (20.9)	69 (21.2)	49 (15.0)	64 (19.6)	46 (14.1)	30 (9.2)
Estimated model parameters						
Intercept	6.72	-20.62	-9.10	-1.52	5.90	-0.50
Linear	-0.53	2.60	1.24	0.28	-0.46	0.23
Quadratic	0.01	-0.08	-0.04	0.01	0.01	-0.01
Model fit characteristics						
Peak age	17	16	17	25	25	27
Median group probabilities	0.90	0.95	0.97	0.99	1.00	0.99
Range	0.50-1.00	0.52-1.00	0.48-1.00	0.60-1.00	0.62-1.00	0.56-1.00
Mean probability-Low Rate	0.85 (0.15)	0.14 (0.15)	0.00 (0.02)	0.00 (0.00)	0.01 (0.02)	0.00 (0.00)
Mean probability-Bell Shaped	0.10 (0.13)	0.88 (0.14)	0.02 (0.05)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)
Mean probability-EOFD	0.02 (0.06)	0.02 (0.08)	0.88 (0.16)	0.01 (0.03)	0.07 (0.12)	0.00 (0.01)
Mean probability-High Rate Persistent	0.00 (0.00)	0.00 (0.00)	0.01 (0.04)	0.95 (0.08)	0.02 (0.06)	0.02 (0.06)
Mean probability-Low Level Persistent	0.00 (0.00)	0.00 (0.00)	0.00 (0.01)	0.02 (0.05)	0.95 (0.08)	0.03 (0.06)
Mean probability-High Rate Escalating	0.00 (0.00)	0.00 (0.00)	0.01 (0.08)	0.05 (0.08)	0.00 (0.00)	0.94 (.11)
OCC	5.58	7.23	7.18	18.70	23.48	15.11
Criminal career parameters						
Age of onset	15.09 (1.55)[bcdef]	14.01 (1.17)[a]	13.67 (1.30)[a]	13.70 (1.29)	14.26 (2.01)[af]	13.20 (1.22)[ae]
Total convictions	8.87 (7.01)[cdef]	9.80 (6.43)[cdef]	26.61 (13.46)[abd]	41.80 (12.78)[abce]	28.50 (15.19)[abd]	34.07 (18.25)[ab]
Total custody length (days)	140 (119)[bcdef]	348 (212)[acdef]	1,041 (461)[abdf]	2,210 (465)[abcef]	957 (391)[abdef]	3,243 (913)[abcde]
Homicide offense	1 (1.5%)	2 (2.9%)	3 (6.1%)	3 (4.7%)	2 (4.3%)	10 (33.3%)

Note. EOFD = Early Onset Fast Desister. [a] Significantly different from Low Rate, [b] Significantly different from Bell Shaped, [c] significantly different from EOFD, [d] Significantly different from High Rate Persistent, [e] Significantly different from Low Level Persistent, [f] Significantly different from High Rate Escalating

The six trajectories are presented in Figure 6.1. Although technically the model examined a count of the number of times that an individual was incarcerated for one month or more, the trajectories will simply be interpreted by their overall amount of time incarcerated at each age period. The low rate trajectory (20.9% of the sample) represented offenders whose duration of incarceration remained low even at the trajectory's peak, with offenders spending an average of one month in custody between ages 15-17. After this period, these offenders were rarely incarcerated for substantive periods of time. The bell shaped trajectory (21.2%) was similar to the low rate trajectory in terms of spending little time in custody, but the arc of the bell shaped trajectory was slightly higher and demonstrated a sharper peak over the mid-adolescent period. However, by age 20, the bell shaped trajectory was virtually indistinguishable from the low rate trajectory. A third trajectory group, referred to as low level persistent (14.1%) resembled the bell shaped trajectory during the latter stages of adolescence, but the two trajectories diverged after this point, with the low level persistent trajectory maintaining a relatively stable length of time incarcerated throughout the period of adulthood, at least through age 28.

The final three trajectories, early onset fast desister (EOFD; 15.0%), high rate persistent (19.6%), and high rate escalating (9.2%) all spent a relatively similar length of time incarcerated during adolescence. However, as the names imply, one showed a sharp decrease in the length of time spent in custody after adolescence (EOFD), one showed a relatively stable duration of incarceration through adulthood (high rate persistent), and one escalated in terms of the length of time spent incarcerated through the 'emerging adulthood' (age 18-23) period of development (high rate escalating). Overall, three trajectories appeared to show a pattern of desistance at the end of adolescence (the low rate, bell shaped, and EOFD trajectories) and three trajectories showed a pattern of continued incarceration between adolescence and adulthood (the low level persistent, high rate persistent, and high rate escalating trajectories. It should be clarified that offenders associated with incarceration trajectories described as showing a pattern of desistance were not necessarily desisting from offending. The term desistance is simply used to describe the shape of the incarceration trajectory and not meant to describe the overall nature of an offender's criminal career.

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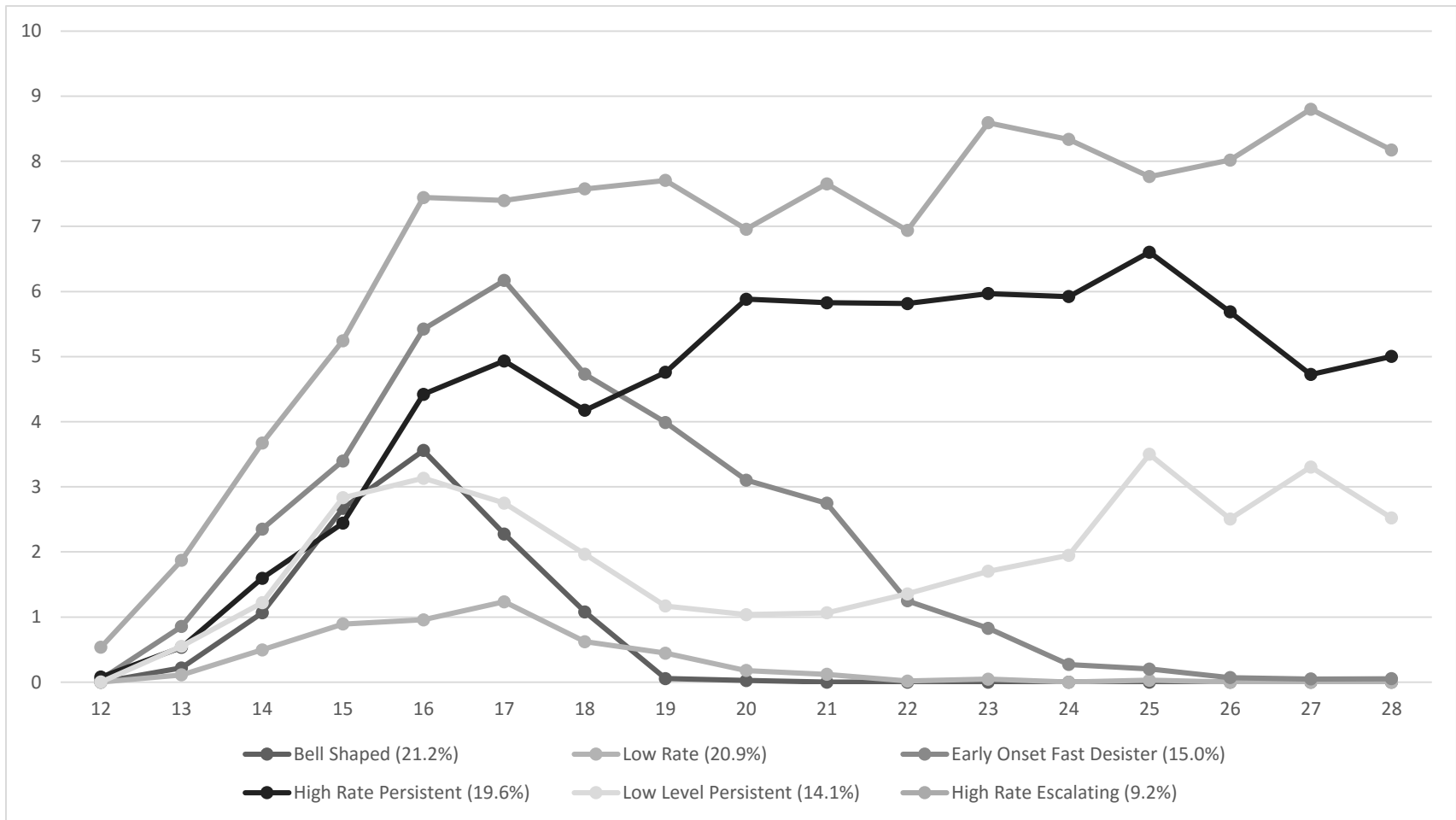
Figure 6.1: Offending trajectories defined by duration of incarceration from ages 12-28

As indicated in Table 6.2 (see above), in contrast to the findings in Chapter Five, especially when inspecting the most serious incarceration trajectories, the age at which length of incarceration peak was much later on in adulthood. Offenders associated with the two trajectories characterized by desistance in adolescence (low rate and bell shaped) differed from all other trajectories in terms of both frequency of offending and length of time incarcerated. Although the EOFD trajectory averaged a non-significantly greater amount of time incarcerated compared to the low level persistent trajectory, the shapes of the two trajectories imply that this relationship would change if the study period was longer. Specifically, the low level persistent trajectory would be associated with a greater length of time spent incarcerated. As such, the low level persistent trajectory was viewed as a more concerning trajectory from a criminal justice system perspective. In line with the findings in Chapter Five, the trajectory associated with greatest number of convictions (high rate persistent) was not the trajectory associated with the greatest amount of time incarcerated (high rate escalating). This finding is evidence of the assertion that the most frequent offenders are involved in less serious offenses.

Looking at average number of convictions, the high rate escalating trajectory had the highest standard deviation (18.25), indicating that this group contained a mix of chronic offenders and non-chronic but serious offenders. Approximately 20 percent of offenders in the high rate escalating trajectory had fewer than 15 convictions. Furthermore, having a homicide offense (attempted murder, manslaughter, second degree homicide, or first degree homicide) was significantly associated with trajectory group membership (χ^2 (5) = 40.89, p < .001), with the highest proportion of homicide offenders found in the high rate escalating trajectory (33.3%). The high rate escalating trajectory therefore appeared to contain some of the most serious offenders in the sample. The second stage of the SPGM analysis involved comparing trajectories across a variety of demographic characteristics, criminogenic risk factors, and measures of psychopathy (see Table 6.3).

Table 6.3: Comparing demographic characteristics, psychopathy, and criminogenic risk factors across trajectories

			Trajectories				
	Low Rate	Bell Shaped	EOFD	High Rate Persistent	Low Level Persistent	High Rate Escalating	χ^2/F, p, Φ/η^2
Demographic characteristics							
Male	51 (75.0%)	42 (60.9%)	41 (83.7%)	61 (95.3%)	40 (87.0%)	27 (90.0%)	χ^2 (5)=30.3, p < .001, Φ=.31
Ethnicity							
Caucasian	42 (61.8%)	42 (63.6%)	29 (59.2%)	41 (64.1%)	20 (44.4%)	21 (70.0%)	n.s.
Aboriginal	10 (14.7%)	14 (21.2%)	16 (32.7%)	17 (26.6%)	17 (37.8%)	7 (23.3%)	χ^2 (5)=10.7, p < .10, Φ=.18
Other	16 (23.5%)	10 (15.2%)	4 (8.2%)	6 (9.4%)	8 (17.8%)	2 (6.7%)	χ^2 (5)=9.4, p < .10, Φ=.17
Measures of psychopathy							
Four factor model	16.01 (5.27)[cdef]	18.42 (6.07)[f]	21.32 (5.35)[a]	20.84 (5.27)[a]	20.05 (5.15)[a]	23.23 (4.98)[ab]	F (5) = 11.0, p < .001, η^2 = .15
Three factor model	10.69 (4.15)[cf]	11.71 (4.96)[f]	13.34 (4.47)[a]	12.88 (4.52)	12.81 (3.97)	14.81 (418)[ab]	F (5) = 4.8, p < .001, η^2 = .07
Interpersonal factor	2.47 (1.89)	2.86 (2.08)	3.20 (2.17)	3.12 (2.08)	3.22 (1.87)	3.70 (2.07)	F (5) = 2.0, p < .10, η^2 = .03
Affective factor	4.00 (2.04)	4.17 (2.11)	4.91 (1.94)	4.21 (1.99)	4.30 (1.90)	5.13 (1.76)	F (5) = 2.3, p < .05, η^2 = .07
Lifestyle factor	4.22 (1.96)[df]	4.68 (2.18)[f]	5.24 (1.93)	5.55 (1.84)[a]	5.28 (1.95)	5.98 (1.76)[ab]	F (5) = 5.3, p < .01, η^2 = .08
Antisocial factor[†]	5.32 (2.35)[bcdef]	6.71 (2.28)[acdf]	7.98 (1.66)[ab]	7.96 (1.71)[ab]	7.26 (1.91)[a]	8.42 (1.80)[ab]	F (5) = 18.0, p < .001, η^2 = .22
'High' PCL:YV score	7 (10.3%)	18 (26.1%)	20 (40.8%)	25 (39.1%)	15 (32.6%)	15 (50.0%)	χ^2 (5)=23.8, p < .001, Φ=.27
Criminogenic factors							
Age of onset-alcohol use	12.56 (1.96)	11.87 (2.18)	11.72 (2.39)	11.95 (2.08)	11.53 (2.37)	12.00 (1.65)	n.s.
Age of onset- drug use	12.23 (2.26)	11.74 (2.07)	11.49 (2.30)	11.61 (2.20)	11.72 (1.99)	11.55 (2.05)	n.s.
Substance use versatility scale	4.08 (2.09)	4.03 (2.09)	4.39 (2.30)	4.80 (1.95)	4.54 (2.04)	4.04 (2.24)	n.s.
Enrolled in school	39 (58.2%)	33 (47.8%)	24 (50.0%)	30 (47.6%)	17 (37.8%)	18 (60.0%)	n.s.
Age of onset- skipping school	13.11 (1.81)[d]	12.27 (2.00)	12.11 (1.68)	11.73 (2.08)[a]	11.92 (2.21)	12.58 (1.60)	F (5) = 3.4, p < .01, η^2 = .06
Age of onset – school trouble	11.10 (2.99)[cd]	10.05 (3.19)	8.70 (2.83)[a]	9.05 (2.80)[a]	9.16 (3.59)	10.42 (2.87)	F (5) = 4.3, p < .01, η^2 = .07
Number of different schools	6.11 (6.53)	5.58 (5.32)	7.49 (8.08)	7.12 (6.43)	5.47 (5.22)	6.10 (4.30)	n.s.
Physical abuse	31 (47.7%)	35 (50.7%)	23 (48.9%)	26 (41.9%)	23 (51.1%)	10 (33.3%)	n.s.
Sexual abuse	15 (23.1%)	27 (39.1%)	12 (26.1%)	7 (11.9%)	6 (13.3%)	5 (16.7%)	χ^2 (5)=17.6, p < .01, Φ=.24
Age sexually active	13.97 (1.31)[cdf]	12.85 (1.85)	12.90 (1.36)[a]	12.83 (1.89)[a]	12.76 (1.50)	12.71 (1.56)[a]	F (5) = 4.7, p < .01, η^2 = .08
Positive self-identity	73.04 (11.28)	72.26 (8.53)	70.80 (11.39)	70.07 (10.68)	70.25 (11.51)	68.22 (7.67)	n.s.
Fighting – weekly basis	9 (15.3%)	14 (21.9%)	16 (38.1%)	21 (35.6%)	14 (34.1%)	8 (28.6%)	χ^2 (5)=10.5, p < .10, Φ=.19
Angers easily	33 (51.6%)	42 (61.8%)	27 (57.4%)	40 (64.5%)	17 (40.5%)	17 (60.7%)	n.s.
Bad temper	46 (71.9%)	48 (70.6%)	36 (76.6%)	52 (82.5%)	33 (78.6%)	19 (65.5%)	n.s.
Family disruption scale	2.46 (1.61)	2.52 (1.54)	3.07 (1.27)	2.79 (1.33)	3.10 (1.51)	2.93 (1.51)	n.s.
Left home for 24hr	50 (76.9%)	55 (80.9%)	37 (78.7%)	47 (74.6%)	30 (73.2%)	21 (70.0%)	n.s.
Kicked out of home for 24hr	28 (44.4%)	32 (48.5%)	27 (57.4%)	28 (45.2%)	16 (40.0%)	10 (33.3%)	n.s.
Raised by biological parents	47 (72.3%)	43 (65.2%)	30 (65.2%)	37 (58.7%)	22 (53.7%)	24 (80.0%)	n.s.

Note. EOFD = Early Onset Fast Desister. [a] Significantly different from Low Rate, [b] Significantly different from Bell Shaped, [c] significantly different from EOFD, [d] Significantly different from High Rate Persistent, [e] Significantly different from Low Level Persistent, [f] Significantly different from High Rate Escalating
[†] Asymptotically *F* distributed

6.4.2. Association between Incarceration Trajectories and Risk Factors

For the bivariate ANOVA analyses in Table 6.3 (see above), Bonferroni (equal variances assumed) or Tamhane (equal variances violated) post-hoc comparisons were used to determine whether two trajectories significantly differed. Eta squared was used as a measure of effect size, with values of 0.01-0.05, 0.06-0.13, and 0.14 and greater interpreted as small, medium, and large effect sizes, respectively (Cohen, 1988). In terms of demographic characteristics, there was a clear relationship between being male and being associated with a trajectory characterized by lengthy periods of incarceration through adulthood. Similar to Chapter Five, if a female chronic incarceration trajectory does exist, it is likely characterized by shorter periods of incarceration relative to male chronic incarceration trajectories. If within-group differences in different measures of trajectories do exist for female offenders, it is likely that identifying such patterns requires conducting SPGM separately by gender. Overall, contrary to Moffitt and Caspi's (2001) assertion that offending patterns for males and females would not differ at the level of the serious and violent offender, the results here are strong evidence that female incarcerated adolescent offenders show less serious offending patterns than their male counterparts.

Trajectory membership varied marginally ($p < .10$) by ethnicity. Individuals identifying with the 'Other' ethnic category (e.g., Indian, Asian, African-Canadian) were particularly unlikely to be associated with the high rate escalating trajectory. In terms of criminogenic risk factors, five characteristics distinguished incarceration trajectory membership. Individuals in the high rate persistent trajectory averaged a significantly ($p < .01$) earlier onset of sexual activity, skipping school, and getting into trouble at school compared to the low rate incarceration trajectory. The high rate escalating trajectory also averaged a significantly ($p < .01$) earlier onset of sexual activity compared to the low rate trajectory. The EOFD trajectory averaged a significantly ($p < .01$) earlier onset of sexual activity and getting into trouble at school compared to the low rate trajectory. Regarding the dichotomous measures examined in Table 6.3, individuals experiencing sexual abuse were more likely to be assigned to incarceration trajectories associated with less time in custody. On the one hand, this may seem counter-intuitive as abuse experiences are

frequently included in risk assessment tools/mentioned within research on the risk factor paradigm (Andrews & Bonta, 2010). On the other hand, this finding is consistent with research on judicial decision making showing that abuse experiences are considered a mitigating factor during sentencing (Barnett, Brodksy, & Davis, 2004) and as such may result in a non-custodial sentence or a shorter custody sentence. Finally, involvement in fights on a weekly basis was marginally ($p < .10$) related to involvement in a more serious incarceration trajectory.

Regarding the bivariate relationship between psychopathy and incarceration trajectories, the most serious incarceration trajectory (high rate escalating) averaged the highest scores on all measures of psychopathy (Table 6.3); however, this average was significantly higher only in comparison to the low rate and bell shaped trajectories. In other words, at the bivariate level, psychopathy scores did not differ between the most serious incarceration trajectories. As well, similar to Chapter Five, the differences between trajectories appeared predominantly due to differences in scores on the antisocial and lifestyle facets of the PCL:YV as opposed to the interpersonal and affective facets. Moving beyond bivariate comparisons, all significant ($p < .05$) and marginally significant ($p < .10$) criminogenic factors and PCL:YV measures were included in a series of multivariate logistic regression analyses with incarceration trajectory membership as the outcome of interest.

Psychopathy and other Covariates of Offending Trajectories

In Table 6.4, two models were examined that differed only on the basis of the measure of psychopathy used. Model 1 presents the findings of a multinomial logistic regression model where a four factor model of psychopathy was included, whereas Model 2 presents the results of the same analysis but with a three factor model included. Table 6.5 presents a third and fourth model where each of the individual facets of the PCL:YV were examined (Model 3) and then collapsed into two factors (Model 4) where the interpersonal and affective facets were combined and the lifestyle and antisocial facets were combined. In all models, gender was not controlled for because of the extremely low base rate of females associated with trajectories characterized by a substantial amount of time incarcerated. Correlations between all variables were examined to assess potential concerns with multicollinearity, especially because of the potential that the four individual

PCL:YV facets would be highly correlated with one another. All correlations were low to moderate (none over 0.5).

The low rate trajectory averaged the least amount of time incarcerated over age, and was therefore used as the reference category in all models. In the first regression model in Table 6.4, as scores on the four factor model increased, the odds of being in the EOFD, high rate persistent, low level persistent, and high rate escalating trajectories all significantly increased, with the odds ratio (OR) being strongest for the high rate escalating trajectory (OR = 1.32, p < .001). Although psychopathy did not increase the odds of membership in the bell shaped trajectory compared to the low rate trajectory, an earlier start to sexual relations significantly increased the odds of membership in the bell shaped trajectory. As well, consistent with the bivariate analyses, sexual abuse significantly decreased the odds of membership in the high rate persistent trajectory compared to the low rate trajectory. Lastly, an earlier onset of getting into trouble at school increased the odds of membership in the EOFD trajectory compared to the low rate trajectory.

The general findings in Model 1 were replicated in Model 2. Psychopathy scores, this time measured with the three factor model, had the strongest effect on increasing the odds of membership in the high rate escalating trajectory (OR = 1.24, p < .01). In terms of other covariates in the model, results mirrored those in Model 2, with the only difference being that an earlier onset of trouble at school also significantly increased the odds of membership in the low level persistent trajectory relative to the low rate trajectory These results were in contrast with results presented in Chapter Five related to psychopathy and trajectories defined by general convictions. Specifically, symptoms of psychopathy measured using the PCL:YV were more informative of incarceration trajectories as opposed to general offending trajectories. In Chapter Five, symptoms of psychopathy influenced the odds of membership in only one of the chronic offending trajectories, whereas here symptoms of psychopathy had a more robust effect as evidenced by the fact that significant odds ratios were obtained for four different offending trajectories compared to the low rate trajectory.

Table 6.1.4: Multinomial logistic regression analysis examining effects of covariates on trajectory membership

| | Model 1 | | | | | Model 2 | | | | |
| | Bell Shaped | EOFD | High Rate Persistent | Low Level Persistent | High Rate Escalating | Bell Shaped | EOFD | High Rate Persistent | Low Level Persistent | High Rate Escalating |
Covariates	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
Demographics										
Caucasian	0.55	**0.15****	0.35	**0.18****	0.66	0.63	**0.18****	0.41	**0.20****	0.78
Psychopathy Measures										
Four factor model	1.01	**1.23****	**1.19****	**1.18****	**1.32*****	.	.	.	.	.
Three factor model	.	.	.	.	.	0.95	**1.16***	**1.14***	**1.18***	**1.24****
Criminogenic Factors										
Age of onset- skip school	0.90	0.86	0.78	0.85	0.97	0.89	0.84	0.76	0.84	0.94
Age of onset- trouble	0.94	**0.77***	0.89	0.83	1.14	0.93	**0.76***	0.87	**0.82***	1.11
Sexual abuse	2.63	1.08	**0.19***	0.47	0.33	2.94	1.37	**0.22***	0.53	0.43
Age sexually active	**0.57****	0.92	0.84	0.81	0.71	**0.55****	0.86	0.80	0.79	0.67
Fighting – weekly basis	0.49	0.58	0.82	0.79	0.35	0.57	0.79	1.11	1.06	0.56
Model Fit	-2LL = 586.65, χ^2= 107.1, df = 35, p<.001					-2LL = 599.55, χ^2= 94.2,df = 35, p<.001				

Note: Low rate trajectory group is the reference category. EOFD = Early Onset Fast Desister.
* p < .05, ** p < .01, *** p < .001. All significant OR do not contain '1' based on 95% Confidence Intervals. Bold-faced type indicates a significant odds ratio.

To better understand the contribution of individual facets, an additional set of analyses were conducted (not shown), where each facet of the PCL:YV was included in the same model. Again, all relevant covariates that were included in Models 1 and 2 were also included in this analysis (see Table 6.5). Of the four facets of the PCL:YV, only the antisocial facet was significant (see Model 3). This facet increased the odds of membership in the EOFD, high rate persistent, and high rate escalating trajectories compared to the low rate trajectory. Thus, in contrast to Chapter Five, the effect of the antisocial facet was more robust; that is, this facet increased the odds of membership in a greater number of trajectories. In Model 4 of Table 6.5, of the two PCL:YV factors, only Factor Two significantly increased the odds of membership in more serious incarceration trajectories relative to the low rate incarceration trajectory. In effect, although the three factor model clearly increased the odds of membership in a more serious incarceration trajectory compared to the low rate trajectory, the antisocial and lifestyle facets of the PCL:YV continued to be the symptom clusters most strongly related to longer periods of incarceration. Nevertheless, to illustrate the importance of scoring high on *all* symptoms of psychopathy, a dichotomous variable used to denote 'high' PCL:YV scores (≥ 25) was entered into an additional model (not shown) that included the same demographic characteristics and criminogenic factors that were included in previous models. Individuals with a 'high' PCL:YV score were 6.40 times more likely to be in the EOFD trajectory, 7.03 times more likely to be in the high rate persistent trajectory, 6.38 times more likely to be in the low level persistent trajectory, and 15.28 times more likely to be in the high rate escalating trajectory (all comparisons made against the low rate trajectory, [$p < .01$]).

Table 6.5: Examining the relationship between different symptoms of psychopathy and incarceration trajectories

	Model 3					Model 4				
	Bell Shaped	EOFD	High Rate Persistent	Low Level Persistent	High Rate Escalating	Bell Shaped	EOFD	High Rate Persistent	Low Level Persistent	High Rate Escalating
Covariates	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
Demographics										
Caucasian	0.59	**0.16****	0.42	**0.19****	0.76	0.53	**0.15****	0.35	**0.17****	0.69
Psychopathy Measures										
Interpersonal facet	0.88	0.97	1.11	1.11	0.99	.	.	.	.	.
Affective facet	1.03	1.39	0.88	1.20	1.24	.	.	.	.	.
Lifestyle facet	0.79	0.88	1.25	1.13	1.19	.	.	.	.	.
Antisocial facet	**1.39***	**1.99*****	**1.65****	1.25	**2.26*****	.	.	.	.	.
Factor 1	.	.	.	.	.	0.94	1.12	0.99	1.14	1.09
Factor 2	.	.	.	.	.	1.09	**1.36****	**1.48*****	1.22	**1.67*****
Criminogenic Factors										
Age of onset- skip school	0.92	0.88	0.81	0.87	1.02	0.94	0.92	0.84	0.89	1.07
Age of onset- trouble	0.94	**0.77***	0.90	0.83	1.19	0.95	**0.78***	0.91	0.84	1.19
Sexual abuse	2.78	1.21	**0.15***	0.43	0.34	2.30	0.94	**0.16***	0.43	0.28
Age sexually active	**0.55****	0.89	0.86	0.80	0.73	**0.57****	0.92	0.85	0.79	0.71
Fighting – weekly basis	0.33	0.34	0.71	0.80	0.25	0.51	0.61	0.82	0.85	0.44
Model Fit	-2LL = 555.95, χ^2= 139.2, df = 50, p<.001					-2LL = 574.41, χ^2= 119.3, df = 40, p<.001				

Note: Low rate trajectory group is the reference category. EOFD = Early Onset Fast Desister.
* $p < .05$, ** $p < .01$, *** $p < .001$. All significant OR do not contain '1' based on 95% Confidence Intervals. Bold-faced type indicates a significant odds ratio.

6.4.3.   Assessing the Prevalence of False Desisters

The final analysis in this study examined the extent to which individuals associated with a serious incarceration trajectory overlapped with the individuals associated with a chronic general conviction offending trajectory identified in Chapter Five. As shown in Table 6.6, defining trajectories by general convictions appeared to result in several instances of false desistance. Specifically, in Chapter Five, two trajectories were found to be associated with desistance that occurred during emerging adulthood (e.g., between ages 18-23), the bell shape trajectory and the slow desister trajectory. A total of 15.8% of offenders in this type of trajectory ($n = 29$) were associated with one of the three most serious incarceration trajectories (the low level persistent, high rate persistent, or high rate escalating trajectories). In effect, approximately one of every six 'desisters' according to trajectories defined by general convictions were still spending a substantial period of time in custody through their mid-twenties. Furthermore, of the 81 offenders that received zero convictions during emerging adulthood (i.e., ages 18-23), 11.1% ($n = 9$) were associated with the two most serious incarceration trajectories. Similarly, of the 127 offenders with zero convictions during mature adulthood (i.e., 24-28), 7.1% ($n = 9$) were associated with the three most serious incarceration trajectories. Taken together, the findings from Table 6.5 are an indication that false desistance should be a concern even when analyses examining general offending convictions account for exposure time, as was the case in Chapter Five. Not only is this concerning in terms of the accuracy of SPGM in determining the prevalence of desistance, it also implies that tests of different theoretical perspectives, including theories of desistance, will likely underestimate effect sizes or, even more concerning, lead to Type II error.

Table 6.6: Assessing the prevalence of false desistance by comparing two types of trajectories

	Low Rate	Bell Shaped	EOFD	High Rate Persistent	Low Level Persistent	High Rate Escalating	χ^2/F, p, Φ/η^2
				Incarceration Trajectories			
General Offending Trajectories							
Bell Shape	37 (40.7%)	47 (51.6%)	4 (4.4%)	0 (0.0%)	1 (1.1%)	2 (2.2%)	χ^2 (5)=135.3, p < .001, Φ =.64
Slow Desister	29 (31.2%)	22 (23.7%)	16 (17.2%)	4 (4.3%)	18 (19.4%)	4 (4.3%)	χ^2 (5)=29.0, p < .001, Φ =.30
Slow Rising Chronic	1 (1.6%)	0 (0.0%)	7 (11.3%)	35 (56.5%)	16 (25.8%)	3 (4.8%)	χ^2 (5)=92.4, p < .001, Φ =.53
High Rate Chronic	1 (1.3%)	0 (0.0%)	22 (27.5%)	25 (31.3%)	11 (13.8%)	21 (26.3%)	χ^2 (5)=93.7, p < .001, Φ =.54
Zero convictions (18-23)	29 (35.8%)	41 (50.6%)	2 (2.5%)	0 (0.0%)	7 (8.6%)	2 (2.5%)	χ^2 (5)=96.5, p < .001, Φ =.55
Zero convictions (24-28)	51 (40.2%)	48 (37.8%)	19 (15.0%)	1 (0.8%)	2 (1.6%)	6 (4.7%)	χ^2 (5)=148.0, p < .001, Φ =.73

Note. EOFD = Early Onset Fast Desister. [a] Significantly different from Low Rate, [b] Significantly different from Bell Shaped, [c] significantly different from EOFD, [d] Significantly different from High Rate Persistent, [e] Significantly different from Low Level Persistent, [f] Significantly different from High Rate Escalating

To illustrate the likelihood of Type II error, PCL:YV scores for the 'false desisters' (n = 29) from the two desistance trajectories in Chapter Five (i.e., those that were in the slow desister or bell shape general conviction trajectory but also one of the three high rate/persistent incarceration trajectories from the current study) were compared to PCL:YV scores for 'true desisters' from these same two general conviction trajectories (n = 155) as well as individuals in the two chronic general conviction trajectories (the SRC and HRC trajectories; n = 142). Scores are presented graphically in Figure 6.2. Based on a Bonferroni post-hoc analysis stemming from the results of an ANOVA analysis (F(2) = 18.30, p < .001), individuals associated with a chronic general conviction trajectory had significantly higher total PCL:YV scores compared to 'true desisters' (p < .001) but not 'false desisters' (p = .140). In other words, false desisters scored similarly high on the PCL:YV compared to chronic offenders, which suggests that the analyses in Chapter Five may have under-estimated the relationship between psychopathy and offending.
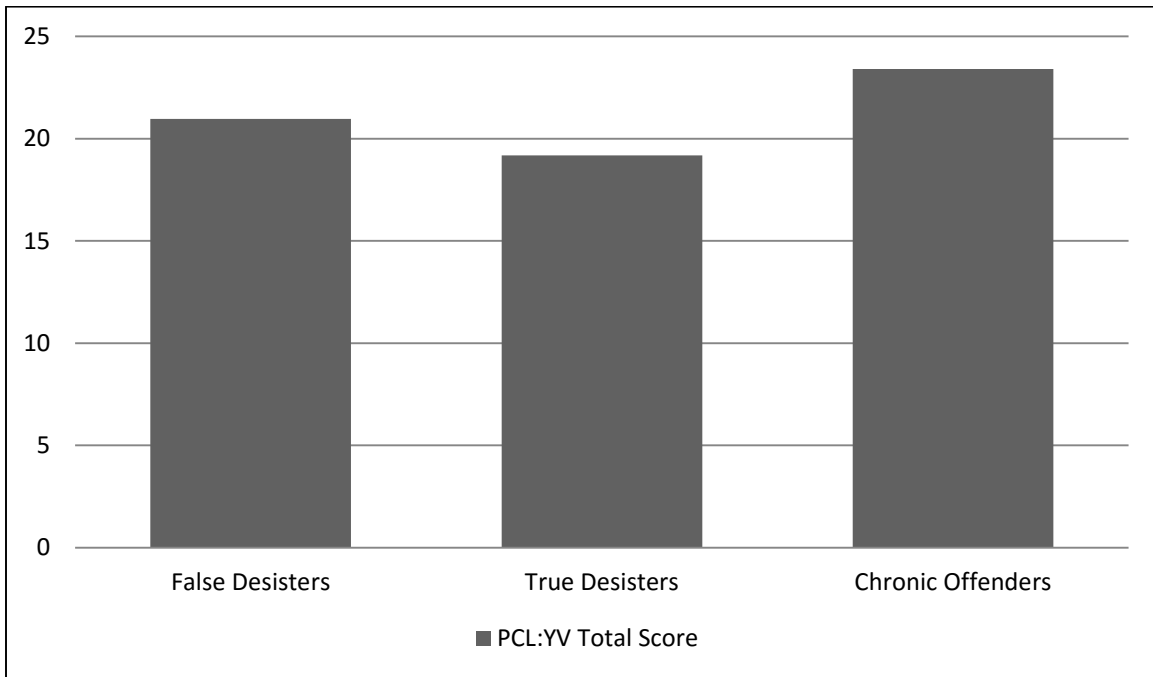
Figure 6.2: PCL:YV total scores across three types of offenders

6.5. Discussion

By using incarceration time as the outcome variable of interest, the line of analysis taken in the current study was a departure from typical trajectory analyses of offending outcomes. In prior research, accounting for exposure time has been difficult. Some studies using SPGM have been forced to artificially inflate the degree of exposure time experienced by an offender (e.g., van der Geest et al., 2009). Other studies have excluded offenders from analysis in instances where exposure time was particularly low (Blokland, Nagin, & Nieuwbeerta, 2005). Other studies failed to account for exposure time altogether (Sampson & Laub, 2003). Due to these difficulties, 'serious' criminal careers are imperfectly captured via measures of general offending (see Chapter Five). A rational next step was to consider how these issues could be addressed within the same study. Of particular concern was the inability of prior uses of SPGM to handle offenders characterized by theoretically-informed risk factors but whom were associated with general conviction trajectories characterized by low levels of offending. Offenders were associated with such trajectories not because of their desistance from crime, but because of their inopportunity to re-offend due to low or non-existent levels of exposure to

opportunities for offending other than those occurring within custody settings. The strategy used in the current study operated under the assumption that incarceration was not just an offset variable used to control for differences in offending opportunity, but rather an indicator of the severity of an offender's criminal career. Conceptually, lengthier durations of incarceration across person-period observations were assumed to capture, within the same trajectory, both high rate offenders and offenders involved in the types of crimes that the criminal justice system responds to in a more punitive manner. Again, previous research on trajectories (e.g., Piquero, 2008) has largely failed to capture these two groups within the same trajectory.

Six incarceration trajectories were identified within the current sample ($n = 326$), which was composed mostly of serious and violent young offenders interviewed during a period of their incarceration in adolescence. The criminal histories of this group were recorded through age 28 to capture longer-term patterns of offending and incarceration. This sample was especially appropriate given recent policy studies and calls for more attention to long-term offenders within criminal career research, including the call for greater attention to the impact of long-term incarceration as a barrier to desistance (Kazemian & Travis, 2015; Loeber & Ahonen, 2014). After establishing the fit of the SPGM model to the sample, three trajectories were found to be characterized by continued incarceration through adulthood and three trajectories were characterized by a near-zero level of incarceration by the end of adolescence or emerging adulthood. A series of multinomial logistic regression analyses supported the conclusion that symptoms of psychopathy, measured using the PCL:YV, were associated with a longer durations of incarceration.

However, similar to prior research concerning symptoms of psychopathy ad offending (Corrado et al., 2004; Gretton et al., 2004; Walters, 2003), when controlling for the lifestyle and antisocial PCL:YV facets, the interpersonal and affective PCL:YV facets, individually and combined as Factor 1, were unrelated to involvement in more serious incarceration trajectories. Still, excluding the controversial antisocial facet via the use of a three factor model (Cooke & Michie, 2001), higher PCL:YV scores were informative of more serious incarceration trajectories, with the strongest effect size observed for the most serious incarceration trajectory. The maintenance of a significant odds ratio between the

four and three factor models illustrates, contrary to prior studies (e.g., Corrado et al., 2004), that the relationship between psychopathy and offending is not solely due to the antisocial facet, even though the antisocial facet was most strongly related to incarceration trajectories. The current focus on incarceration rather than convictions or arrests is perhaps one reason for the difference across studies. A second reason for the difference could be related to the current study's emphasis on measuring long-term offending outcomes as opposed to recidivism. The former approach better captures the heterogeneity of offending outcomes, especially when it comes to studying offender samples. By focusing on incarceration to establish offending trajectories, the current study contributed to the extant literature on psychopathy and offending in two ways. First, the study expanded upon the nomological net concerning how symptoms of psychopathy influence different offending outcomes. Second, the current study illustrated that time incarcerated is not simply 'noise' that must be accounted for to better understand criminal career parameters. Rather, theories specifying the relationship between risk factors and *serious* crime over the life course may be accurately tested via analyses that take better care to understand incarceration as a *direct* measure of offending severity.

6.5.1. The Extent to which Incarceration is an Indicator of Offending Severity

The analyses in the current study were undertaken based on the premise that lengthier periods of time incarcerated indicated that an offender was involved in a more serious offense. However, other factors can also influence sentence length. For example, prior criminal record may be used as an aggravating factor that warrants a lengthier sentence (Clancy et al., 1981). Additionally, individuals that show a lack of remorse towards their offense may be responded to with a more serious sentence (Heilbrun, 1990). Given that lack of remorse is a prototypical symptom of psychopathy (Cooke et al., 2012), it is quite likely that the types of individuals scoring high on the PCL:YV in the current study also are the types of individuals most likely to receive a lengthier sentence irrespective of the type of offense they committed. For example, in some jurisdictions, psychopathy will be treated as an aggravating circumstance (e.g., Monahan, 1996) based on research showing this disorder's association with an increased likelihood of recidivism (Hare, 1996).

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At the extreme end of this argument, Davidson (2015) suggested that high scores on instruments such as the PCL-R warranted life sentences.

This is important, because the length of time an offender is incarcerated for may be partially determined by the nature of their offense and partially determined by a nature of (a) their prior criminal record, and (b) their attitude or behavior during the court process. As such, the current study may have used a somewhat imprecise measure of offending severity, and this susceptibility for imprecision may be greatest among individuals scoring high on the PCL:YV. That said, given both Canadian Criminal Code sentencing guidelines (*Criminal Code,* 1985, s 718) and case law serving as precedent for the sentencing of a given offense, the offender's prior criminal record and attitude or behavior during the court process will likely have only a marginal effect on their length of time incarcerated. For example, looking at Figure 6.1, the high rate escalating trajectory, which was also associated with the highest PCL:YV scores, averaged over half of an age-period incarcerated by age 15. It is therefore unlikely that prior criminal record became a serious aggravating factor at sentencing during this early stage of the offender's criminal career.

As mentioned, the current study did not follow offenders into middle adulthood. Additionally, by defining trajectories solely on the basis of incarceration, the types of offenses leading up to incarceration were missing from this measure of the severity of an offender's criminal career. In effect, reliance on incarceration means that offenses preceding the age at which an offender was first incarcerated were not captured by the trajectories in the current study. Understanding the types of offenses that lead into a more lengthy incarceration trajectory are likely important from a crime prevention perspective. It is quite rare for an individual's first offense to result in incarceration; the criminal activity of most individuals tends to gradually increase in severity over a period of several years (Farrington, 1986; Blumstein, Cohen, Das, & Moitra, 1988; Le Blanc and Loeber, 1998). Understanding the development of serious offending trajectories should therefore consider the role of prior behavioral pathways specified by developmental criminologists (e.g., Loeber & Hay, 1994).

Despite some of the problems associated with a reliance on incarceration to define offense severity, the approach used in the current study helped clarify some discrepancies

associated with prior trajectory research. Specifically, modeling incarceration may be helpful for understanding why offending appears to peak at the same age regardless of the type of offending trajectory an individual is associated with. Sampson and Laub (2003) recognized that their high rate trajectory's peak frequency of offending occurred at the same time as their adolescence limited-type trajectory. These authors questioned the utility of life course persistent theories (e.g., Moffitt, 1993) when crime for this type of offender peaks at the same age as adolescence limited trajectories, albeit at a higher level. Table 6.2 helps reconcile this discrepancy between theory and research. The most serious incarceration trajectories were associated with a peak age of incarceration that occurred during the mid to late twenties. As these trajectories were also characterized by more frequent general offending, it follows that offenders associated with a chronic general conviction trajectory will appear to show peak levels of offending towards the end of adolescence, but only because after this point these individuals tend to spend less time in the community due to increases in the amount of time spent incarcerated. In effect, these individuals appear to commit fewer offenses, but in large part this may be due to spending a greater amount of time in custody. Future research should examine whether crime frequency for individuals associated with a high rate trajectory peaks at a later age once crime frequency is prorated by identifying the expected number of convictions an offender would have received had they spent a full year in the community. For example, an offender with six convictions and six months exposure time would be given a pro-rated score of 12 convictions.

6.5.2. Explicating the Importance of Incarceration Trajectories for Desistance through Informal Social Controls

Offenders following longer-term incarceration trajectories should be of particular concern to practitioners within the criminal justice system. Although van der Geest et al.'s (2016) study indicated that incarceration does not directly impact employment for serious offenders, it appears that this is the case only because employment is so rare within this group of individuals. Van der Geest et al. (2016) explained that this group of offenders for a variety of reasons likely lacked employable skills to begin with. As such, for this group labeling effects (e.g., Becker, 1963) are likely to be secondary to specific personality (e.g., psychopathy) and other characteristics that (a) decrease an individual's likelihood of

seeking employment, or (b) decrease an employer's likelihood of hiring that individual irrespective of criminal record. For offenders characterized by high levels of incarceration, substantive ties to the community that are helpful for gaining employment and other sources of informal social control are likely completely missing[34]. Two unaddressed questions include the degree to which individuals characterized by symptoms of psychopathy are part of the non-participating employment trajectory identified by van der Geest et al. (2016) and somewhat relatedly, whether the role of employment on desistance operates similarly across different incarceration trajectories. The latter question has implications for life course theorists' assertions that the effect of informal social controls operate the same way across different offending trajectories (Laub & Sampson, 2001).

6.5.3.   Limitations and Future Research

Generalizability

Generalizability issues can be divided into three categories: research design, sample demographics, and international variations in sentencing practices. Beginning with research design issues, like Chapter Five, the current study was limited by the duration of the follow-up period. For many of these offenders, their criminal careers are still incomplete. For example, the low level persistent trajectory may appear to be a much more serious incarceration trajectory compared to the EOFD incarceration trajectory if the study continued to measure incarceration into middle adulthood. Further, although the selection of a sample of incarcerated adolescent offenders helped address issues associated with prior trajectory studies in terms of low base rates of serious offenders (e.g., Sampson & Laub, 2003), the use of this sample precluded the identification of an 'adult-onset' incarceration trajectory. Creating incarceration trajectories as opposed to accounting for exposure time within Proc TRAJ may be unnecessary for non-offender samples given that the magnitude of the effect of exposure time on offending trajectories is weaker in community-based samples (e.g., Wiesner & Capaldi, 2003). At the same time,

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[34] Given the short term but not long term impact of incarceration on unemployment demonstrated by van der Geest et al. (2016), for offenders who have been employed and spend less time in custody, their incarceration may simply temporarily disconnect them from informal social controls.

the type of offender sample used in the current study was necessary for addressing certain theoretical perspectives, especially desistance theories (see Chapter Five).

The demographic characteristics of the sample may also impact generalizability. The current study was conducted in British Columbia, Canada and therefore the percentage of Aboriginal offenders was dissimilar from incarcerated adolescent offenders in the United States (e.g., Teplin et al., 2013). However, the over-representation of Aboriginal offenders in Canada is not dissimilar to the over-representation of African American and Hispanic offenders in the United States (Teplin et al., 2013). The over-representation of Aboriginal youth may still be generalizable to some jurisdictions in the United States, such as Alaska, North Dakota, South Dakota, and Montana, where Native Americans account for 29–42% of all youth in custody (Cross, 2008). Looking beyond North America, the over-representation of Aboriginal offenders is also typical within other jurisdictions such as Australia (Blagg, 1997) and New Zealand (e.g., Fergusson, Horwood, & Swain-Campbell, 2003). As well, although both males and females were included in the study, the findings may be male-specific. There is a long history in criminology that involves either excluding females from sampling strategies, or simply treating gender as a control variable. Greater attention to within-group differences in female offending patterns and associated risk/protective factors is needed (Odgers et al., 2007). This may require examining offending trajectories specifically for female offenders.

The duration of incarceration associated with the trajectories in the current study must be reflected upon with consideration of how macro and micro-level explanations for jurisdictional variations in sentencing policies may affect study generalizability. At the macro-level, consideration must be given to how Canadian sentencing policies might differ from those in other jurisdictions. For example, Blokland et al. (2005) mentioned that lengths of incarceration in the Netherlands were substantively shorter compared to the United States. Sentence lengths is Kyvsgaard's (2003) examination of offending severity also appeared to be more similar to those in the Netherlands compared to those in the United States. Andrews and Bonta (2010) noted that Canada's sentencing philosophy, although formally acknowledging the importance of rehabilitation, was moving more towards the United States' tough-on-crime approach. As such, a replication of this study within a sample of offenders from the Netherlands or Scandinavian countries may find

trajectories associated with less time incarcerated whereas replications in the United States may find trajectories associated with greater time incarcerated. At the micro-level, consideration must be given to how racial and other prejudices affect sentence severity (Kleck, 1981; Sampson & Laub, 1993)[35], and what this means for the assumption that offenders spending more time in custody are more serious offenders. There was no evidence in the current study that minority status was associated with more punitive sentences, but research in the United States reflects a different conclusion (e.g., Kleck, 1981). Racial prejudices will increase the likelihood of Type II error when studying the relationship between theoretically-informed risk factors and offending severity measured via incarceration.

Measurement of Psychopathy

By using a three factor model to assess the relationship between symptoms of psychopathy and incarceration trajectories, the current study was able to avoid tautological issues associated with the use of delinquent, criminal, and antisocial behavior to score the PCL:YV (e.g., Cooke, Michie, Hart, & Clark, 2004; Dawson, McCuish, Hart, & Corrado, 2012). However, concerns remain about whether the PCL:YV adequately captures the interpersonal and affective deficits associated with the psychopathy construct. Very importantly, as Cooke et al. (2012) discussed, the PCL:YV cannot be equated with the psychopathy construct. As such, the lack of a relationship between interpersonal and affective deficits and a more serious incarceration trajectory may have been moreseo a product of the limitations of the PCL:YV's ability to measure psychopathy as opposed to the fact that these dimensions of psychopathy are not related to involvement in serious offending. This concern can be addressed in future research by examining other psychopathy instruments, such as the Comprehensive Assessment of Psychopathic Personality (CAPP). The CAPP was developed with the intention of better capturing *personality* symptoms of psychopathy (Cooke et al., 2004). Sandvik et al. (2012) demonstrated that the CAPP more strongly emphasized affective symptoms of psychopathy compared to the PCL-R.

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[35] This is discussed as a micro-level problem because sentences are ultimately determined by an individual or small group of individuals. It is not being argued here that racial prejudice is solely explained at the micro-level.

Capturing the Severity of an Offender's Criminal Career

Researchers should consider using joint trajectory modeling in future studies to examine, simultaneously, an individual's trajectory of both incarceration and general convictions (see Brame, Mulvey, & Piquero, 2001 for an example). Compared to the examination of offending severity and offending frequency shown in Table 6.6, joint trajectory modeling may be a more nuanced method of examining the extent to which individuals incarcerated for lengthy periods of time are also more frequent offenders, more serious offenders, or both. As an alternative to using incarceration time to directly measure offense severity, future research could identify the average sentence length for a variety of different offense categories (e.g., Kyvsgaard, 2003). This would allow offenses to be ranked on a scale of increasing severity. In turn, escalation in an offender's trajectory could be captured where, instead of frequency, yearly outcomes would be defined by an offender's most serious offense. Thus, using SPGM, trajectories could be evaluated in terms of which individuals showed escalation in their criminal career through adolescence, which individuals committed serious offenses across adolescence and adulthood, and which individuals remained involved in non-serious offenses. For such an analysis, it will be necessary to ensure substantial variation in the range of severity scores in order to accurately capture escalation in an offender's trajectory. To ensure objectivity in rankings of offending severity, researchers should consult the relevant case law and criminal code legislation. For example, although violent offenses are generally viewed as more serious than property offenses, minor assault may be viewed by the courts as a less serious offense compared to theft of a motor vehicle.

SPGM was considered appropriate for the modeling of incarceration trajectories despite challenges finding the appropriate method in Proc TRAJ for modeling the distribution of months incarcerated over age. The gravity of the limitation of this approach should not be decided upon without first giving consideration to the intent behind the analysis. The intention in this chapter was not to describe the process of incarceration, it was to use incarceration as a proxy for offending severity. As many have previously warned, the trajectories observed here should not be reified (e.g., Nagin & Tremblay, 2005). Rather, SPGM was simply a tool used to help make sense of differences in the severity of criminal careers and as a way to deal with the elusive challenge of incorporating exposure time into Proc TRAJ analyses.

Conclusion

Instead of artificially inflating the degree of exposure time that offenders experienced, which is a typical necessity for studies controlling for exposure time within offender samples (e.g., van der Geest et al., 2009), the current study used incarceration time as the outcome of interest. This approach had the dual benefit of addressing limitations in prior research while also providing an indication of the severity of an offender's criminal career. Modeling offense severity was missing from prior trajectory analyses, which almost exclusively focused on general offending (Piquero, 2008). By capturing offense severity, the current study contributed to the extant literature by demonstrating that: (1) symptoms of psychopathy were associated with a more serious offending trajectory (interpreted via length of incarceration), and (2) offenders associated with the most serious offending trajectory were not necessarily the most frequent offenders. This latter point supports the conclusion that it is difficult to identify chronic life course persistent offenders because eventually these offenders will receive lengthy custodial sentences that prohibit their involvement in additional crimes. From a desistance theory perspective, attention should be given to the manner in which time incarcerated weakens existing forms of informal social control (e.g., connections to family) or functions to make obtaining informal social controls (e.g., employment) more difficult. Attention should also be given to van der Geest et al.'s (2016) finding that incarceration will only impact employment for offenders with employable skills who are associated with a less serious offending pattern. As such, desistance theories need to be wary of one-size-fits-all policy solutions. For some offenders, consideration should be given to how incarceration will negatively influence their likelihood of employment. For other offenders, consideration should be given to providing treatment/intervention to improve offender deficits that were initially preventing employment and then developing programs that help these offenders establish employable skills.

Chapter 7.

Study 3: The Role of Symptoms of Psychopathy in Persistent Violence over the Criminal Career

7.1. Introduction

Several criminal career studies have indicated that violent offending and general offending can be explained by the same risk factors (e.g., Capaldi & Patterson, 1996; Farrington, 1989). Not surprisingly, parsimonious theories that view violence as part of a general antisocial tendency have been predominant (Capaldi & Patterson, 1996; DeLisi & Vaughn, 2014; Farrington, 1991, 1998). However, Hart (1998) argued that explanations of violence were insufficient if they did not consider the role of psychopathic personality disturbance (PPD). Given that measures of psychopathy have been notably absent in criminal career research (Farrington, 2005), it may be premature to conclude that specific explanations of violent offending are unwarranted. As violent offending is common within incarcerated samples, it is important to distinguish between offenders that eventually desist from violent offending and offenders that persist in their involvement in violence throughout adulthood. Symptoms of psychopathy was introduced in the current study as a factor that can potentially differentiate individuals that persist or desist from violent offending.

The importance of symptoms of psychopathy in predicting violence outcomes is well recognized within the literature on risk assessment. Some have argued that psychopathy is the single best predictor of violent offending (e.g., Douglas, Vincent, & Edens, 2006; Harris, Rice, & Lalumière, 2001). Consequently, this construct has been included in several violence risk assessment tools, such as the SAVRY (Borum, Bartel, & Forth, 2002), HCR-20 (Webster, Douglas, Eaves, & Hart, 1997), and VRAG (Quinsey, Harris, Rice, & Cormier, 1998). Just as the risk assessment literature can help guide criminal career researchers' incorporation of PPD as a key covariate of offending trajectories, the criminal career paradigm can help guide risk assessors' measurement of offending outcomes. Specifically, there is a tendency within the violence risk assessment

literature to focus only on the 'next offense' (i.e., recidivism outcomes), instead of on the development of violent offending over the life course (Lussier, McCuish, & Corrado, 2015). For example, practitioners administering these different risk assessment instruments do not differentiate between individuals that recidivated as part of an escalating trajectory and individuals that recidivated while in a process of desistance. From both a theoretical (e.g., Blumstein, Cohen, Roth, & Visher, 1986; DeLisi & Piquero, 2011) and empirical (Lussier & Davies, 2011) perspective, identifying 'risk' based on recidivism is misleading as an indicator of the seriousness of an offender. In addition, focusing more narrowly on recidivism outcomes likely also underestimates the strength of the relationship between symptoms of psychopathy and violence. Recidivism amongst incarcerated offenders is common, but in the same sample, high symptoms of psychopathy is less common (Gretton et al., 2004). As a consequence, recidivism outcomes are too common and psychopathy too precise for the former to be expected to fully explain the latter (see Figure 3.2 in Chapter Three). Hart (1998) argued that more sophisticated analytic strategies that better modeled the complexity of offending over time were necessary to adequately capture this relationship. Modeling violent offending trajectories is one method of capturing the complexity of patterns of violence over time (see Brame et al., 2001; MacDonald, Haviland, & Morral, 2009; Piquero, Brame, Mazerolle, & Haapanen, 2002). Thus far; however, the role of symptoms of psychopathy in helping to explain the unfolding of a trajectory characterized by persistent involvement in violence has not been examined.

7.1.1.   Evidence for the Relationship between PPD and Violence

Although not all individuals with symptoms of psychopathy are violent, and not all violent offenders have high symptoms of psychopathy, individuals with high symptoms of psychopathy are disproportionately involved in violence (Hare & Neumann, 2008; Hart & Hare, 1997; Ribeiro da Silva, Rijo, & Salekin, 2012). The relationship between symptoms of psychopathy and an earlier time to violence recidivism has been demonstrated in both youth and adult incarcerated populations (Corrado, Vincent, Hart, & Cohen, 2004; Douglas et al., 2006; Harris; Rice, & Cormier, 1991; Serin, 1996; Vaughn & DeLisi, 2008; Vaughn, Howard, & DeLisi, 2008). Despite being one of the most important individual-level risk factors for violent offending, Vitacco et al. (2006) noted a clear lack of prospective longitudinal studies examining the relationship between PPD and persistent violence.

Overall, there has been a general lack of research on the long-term predictive validity of PPD. As indicated in Chapter Five, high scores on both the three and four factor models of the PCL:YV were indicative of involvement in chronic general offending from age 12 to 28 even after controlling for several important criminogenic covariates. However, contrary to expectation, the affective and interpersonal facets of the PCL:YV did not differentiate persisters from desisters. As such, these prototypical symptoms of PPD (see Cooke, Hart, Cohen, & Michie, 2012; Hoff, Rypdal, Mykletum, & Cooke, 2012; Kreis & Cooke, 2011) were asserted to perhaps be more well-suited to explaining persistent violent offending. The specific mechanisms in which symptoms of psychopathy appear to operate on the unfolding of a trajectory characterized by persistent violence is described below.

7.1.2.   The Relationship between Symptoms of Psychopathy and Persistent Violence: A Situational Action Perspective

The relatively few criminological theories offering specific explanations for involvement in violent behavior may be due to the assertion that general theories of serious criminality sufficiently explain violent offending too (Capaldi & Patterson, 1996; Farrington, 1991, 1998). Not surprisingly, there are even fewer criminological theories that specify the relationship between personality types, such as PPD, and persistent violence. If a relationship between PPD and persistent violence does exist, theories that help to explain the causal mechanisms responsible for this relationship are critical, as prediction alone cannot sufficiently explain the development of persistent violence (e.g., Laub, 2006). Wikström's situational action theory of violence (Wikström, 2006; Wikström & Treiber, 2007, 2009), at least potentially, provides a framework for specifying the complex hypothesized relationship between high symptoms of psychopathy and violence. Although situational action theory is an event-based perspective, Wikström and Treiber's (2009) description of the conditions that precipitate violent events are conditions that appear consistently present among individuals with high symptoms of psychopathy.

In situational action theory, the two main conditions facilitating violence are propensity and situational context (e.g., environment), whereas the absence of deterrence acts as an disinhibiting factor as opposed to a facilitating factor (Wikström & Treiber, 2009). In reference to propensity, Wikström and Treiber (2009) asserted that an

individual's set of moral rules combined with their low levels of self-control increases their propensity to use violence as an action alternative (e.g., as an alternative to walking away from a conflict or diffusing a dispute). Wikstrom and Treiber (2009) also argued that situational contexts such as intoxication, provocation, and peer-influence facilitated violent offenses by increasing an offender's level of disinhibition. In a situational context not conducive to violence, an individual with a high propensity for violence will still offend, provided that external deterrent factors (e.g., presence of police, responsible adults) are absent or not recognized by the offender (Wikström & Treiber, 2009). A high-propensity individual may, therefore, be more likely to be involved in persistent violence than individuals with a low propensity for violence, because the latter are dependent upon specific situational contexts to occur consistently across the life course. In other words, desistance from violent offending is possible by changing the types of situational contexts that an individual is exposed to or by creating factors that will act as a deterrent to involvement in such activities even when exposed to a particular situational context. However, a high propensity for violence will act as a barrier to desistance because removal of typical situational contexts will not be sufficient for reducing involvement in violence. As well, the high propensity individual may be less likely to recognize factors that should deter them from violence, or, alternatively, may recognize this factor but not care about the consequence (e.g., a lack of empathy for a potential victim).

Although a direct test of situational action theory is not the purpose of the current study, through its concepts of propensity, situational context, and deterrence, this theory provides a framework for explaining why individuals with symptoms of psychopathy are more likely to be involved in persistent violence. Regarding Wikström and Treiber's (2009) concept of violence propensity, Gretton, Hare, and Catchpole (2004) noted that adolescent offenders with PPD were characterized by a strong and long-term risk for involvement in violence that distinguished them from other offenders. High symptoms of psychopathy may also increase the likelihood of situational contexts that are conducive to violence. For example, individuals with PPD tended to commit violence indiscriminately (e.g., against strangers and persons known to them, against both males and females), and in response to both instrumental and reactive motivations. In contrast, individuals without strong symptoms of psychopathy tended to require specific situational contexts, such as a victim previously known to them or an event that elicited a strong emotional

response, to facilitate involvement in violence (see Hart & Dempster, 1997; Serin, 1991; Williamson, Hare, & Wong, 1987). In effect, the conditions necessary for violence are set at a lower threshold for individuals with PPD, making desistance less likely. Furthermore, regarding Wikström and Treiber's (2009) emphasis on factors that may deter even high propensity individuals in situational contexts conducive to violence, it is noteworthy that several studies have found that individuals with high symptoms of psychopathy were less sensitive to the possibility of punishment (Lykken, 1995; Newman, MacCoon, Vaughn, & Sadeh, 2005) and thus factors known to promote desistance amongst other offenders may have less of an impact on individuals with PPD.

Finally, because symptoms of PPD are asserted to be at least moderately stable over time (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Vachon, Lynam, Loeber, & Stouthamer-Loeber, 2012), from a developmental perspective on violence, it is likely that violence involvement will continue over the life course. In sum, situational action theory, although an event-based perspective, can help guide the specification of how individuals with symptoms of psychopathy (a) have a high risk for violence, (b) have personality profiles that create situational contexts that keep them primed for violence, and (c) have personality symptoms associated with a lack of concern for consequences to themselves and others that limits the effectiveness of factors that may typically promote desistance (e.g., act as turning points) amongst other types of offenders. However, there are several conceptual challenges associated with assessing the hypothesized association between symptoms of psychopathy and persistent violence.

7.1.3. The Association between PPD and Persistent Violence: Some Conceptual Challenges

The specific risk factors associated with persistently violent offenders are relatively unknown, in part because this type of offender is rarely found within the types of samples typically examined within criminal career research (Farrington, 1997; Piquero et al., 2002). Given the low prevalence of both PPD and persistent violence in general population samples identifying risk factors for persistent violence likely requires research using adjudicated samples with sufficient base rates of both symptoms of psychopathy and violence (DeLisi, 2001). By using a sample of formerly incarcerated serious and violent

young offenders whose offending histories were coded from age 12 to 28, the current study was unaffected by low base-rate concerns.

As another conceptual challenge to the study of PPD and persistent violence, many argue that violent offending occurs within the context of a versatile criminal career characterized primarily by non-violent offending (Barnes, 2014; Doherty & Ensminger, 2014; Farrington, Snyder, & Finnegan, 1988; Loeber et al., 2008; Weiner, 1989). If persistent violent offenders are simply chronic general offenders, then any relationship between PPD and persistent violence may simply reflect the relationship between PPD and general offending. Controlling for an offender's involvement in non-violent offending is necessary in order to make conclusions about the relationship between PPD and persistent violence. One way to control for involvement in non-violent offending is through a statistical analysis known as joint trajectory modeling, which is an extension of the traditional semi-parametric group-based model, and can be used to facilitate the simultaneous modeling of violent and non-violent offending trajectories (Piquero, Jennings, & Barnes, 2012). In effect, this analysis allows for a determination of whether all individuals following a chronic/persistent violent trajectory are also following a chronic/persistent non-offending trajectory. If this result were observed, it would essentially indicate that explanations of chronic general offenders sufficiently explain chronic violent offenders.

Using joint trajectory modeling, Brame et al. (2001) examined violent and non-violent offending patterns among participants from the Philadelphia Birth Cohort study. Their results indicated that persistent violent offenders were also chronic non-violent offenders. However, Brame et al. (2001) constrained their model in a manner that required individuals in a specific violent trajectory to also be assigned to a specific non-violent trajectory. This may have artificially inflated the degree of concordance between offenders belonging to high-violence/high-non-violence trajectories (see MacDonald et al., 2009). In contrast, using a sample of serious young offenders from the California Youth Authority (CYA) study, Piquero et al. (2002) allowed trajectories of violent and non-violent offending to be measured independently. These authors found that not all chronic violent offenders were also chronic non-violent offenders. However, support for specific explanations of chronic violent offending were not found in this study. Specifically, negative life

circumstance and other covariates examined were not helpful in distinguishing offenders associated with continued violent offending or desistance from violent offending. At the same time, perhaps negative life events and other risk factors measured in the CYA lacked the specificity needed to explain chronic violent offending (e.g., such factors were too common among offenders to differentiate between offenders). To explore this issue in greater detail, joint trajectory modeling was used in the current study to simultaneously estimate violent and non-violent offending trajectories. With the expectation that findings would be in line with the Piquero et al. (2002) study, the second step planned of the analytic strategy involved the incorporation of symptoms of psychopathy measured via the PCL:YV as well as other covariates to help explain association with a trajectory characterized by continued violent offending but desistance from non-violent offending between adolescence and adulthood (age 12-28).

7.2. Methodology

7.2.1. Sample

Data for the current study were derived from the Incarcerated Serious and Violent Young Offender Study conducted in British Columbia, Canada. As part of this study, adolescent offenders between the ages of 12 and 19 were interviewed in open and secure custody facilities within the Greater Vancouver Regional District and surrounding areas. Focus within the current study was on the sub-sample of offenders ($n = 326$) that had been assessed using the PCL:YV. With the exception of seven percent of the sample who were between age 25 and 27 at the time of data collection, violent and non-violent convictions for all offenders were coded until age 28. The sample is overwhelmingly composed of male (80.4%) and Caucasian (60.9%) offenders. On average, offenders were approximately 16 years old at the time of their assessment (see Table 7.1 for sample characteristics).

Table 7.1: Descriptive information for the sample (*n* = 326)

Individual characteristics	% (*n*)	Mean (SD)
Demographic Characteristics		
Gender		
Male	80.4 (262)	
Female	19.6 (64)	
Ethnic origin		
Caucasian	60.9 (196)	
Aboriginal	24.8 (80)	
Other	14.3 (46)	
Measures of psychopathy		
Total PCL: YV Score		21.19 (6.37)
Four factor model		19.50 (5.82)
Three factor model		12.41 (4.56)
Interpersonal factor		3.00 (2.04)
Affective factor		4.36 (2.01)
Lifestyle factor		5.04 (2.03)
Antisocial factor		7.09 (2.26)
Criminogenic risk factors		
Age of onset – alcohol use		11.97 (2.14)
Age of onset – drug use		11.75 (2.15)
Substance use versatility scale		4.31 (2.11)
Enrolled in school	50.0 (161)	
Age of onset – skipping school		12.29 (1.98)
Age of onset – trouble at school		9.73 (3.14)
Number of different schools		6.31 (6.17)
Physical abuse	46.5 (148)	
Sexual abuse	22.9 (72)	
Age of onset – sexual activity		13.05 (1.67)
Positive self identity		71.16 (10.41)
Fighting – weekly basis	28.0 (82)	
Angers easily	56.6 (176)	
Bad temper	74.8 (234)	
Family disruption scale		2.76 (1.48)
Left home for 24hr	76.4 (240)	
Kicked out of home for 24hr	45.8 (141)	
Raised by biological parents	65.3 (203)	
Criminal career measures		
Days in custody		1,166 (1,167)
Age of onset		14.09 (1.55)
Non-violence frequency		20.51 (16.55)
Violence frequency		2.72 (2.53)
Continuity of violence	36.2 (118)	

7.2.2. Procedure

The purpose of the Incarcerated Serious and Violent Young Offender Study was to conduct interviews with juvenile offenders and collect file-based information on risk factors associated with adolescent criminal activity and the continuation of this activity, or desistance from this activity, into adulthood. The British Columbia Ministry of Child and Family Development (MCFD) provided the informed consent required to recruit participants. MCFD serves as the legal guardian to all youth in custody, and their consent allowed the research team to approach all youth in custody centers throughout the province of British Columbia. Youth were approached while they were incarcerated and asked whether they wished to participate. Specific procedures involved in recruitment have been discussed at length in the two previous chapters.

7.2.3. Measures

Ethnicity and gender were measured through self-report interviews. Although some offenders in the current study were in their early thirties, criminal trajectories were only measured to age 28 and therefore it was unnecessary to control for age in subsequent analyses. The primary focus within the current study was on whether higher symptoms of psychopathy measured via the PCL:YV, controlling for other criminogenic factors, were associated with persistent violent offending, controlling for involvement in non-violent offending. In addition to adolescent symptoms of psychopathy, seven domains of risk factors were examined: substance use, school behavior issues, abuse experiences, sexual activity, personality development, residential mobility, and aggression. PCL: YV scores and all criminogenic risk factors were measured at the time of the participant's interview during their incarceration in adolescence (see Table 7.1 above).

Psychopathy Checklist: Youth Version

The PCL:YV[36] is a symptom rating scale that ranges from 0-2 (0 = *item does not apply*; 1 = *item applies somewhat*; 2 = *item definitely applies*) and is scored using

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[36] The manualized version of the PCL: YV (Forth et al., 2003) was not available when interviews were taking place. The version used in the current study is the same used in Forth (1995).

information from a 60-90 minute semi-structured interview as well as a review of file-based collateral information. Inter-rater reliability was not conducted in this particular study; however, Vincent (2002) evaluated inter-rater reliability in a subsample of 30 randomly selected cases and the intraclass correlation coefficient was high ($ICC_1 = 0.92$). The 20 items comprising the PCL:YV were identified by Forth et al. (2003) as the fundamental personality and behavioral traits believed to represent the construct of PPD in adolescence. These 20 items are asserted to represent different facets of the underlying psychopathy construct, though the appropriate number of facets has been debated. Forth et al. (2003) recommended using a four factor model that consists of an interpersonal facet, an affective facet, a lifestyle facet, and an antisocial facet. Cooke and Michie (2001) recommended a three-factor model that excludes Forth et al.'s (2003) antisocial facet to avoid relying on measures of prior criminal behavior to predict future criminal behavior. Total scores, factor scores, and scores on individual facets are presented in Table 7.1. Approximately 30% of males and 34% of females scored what could be considered 'high' on the PCL:YV (25 or higher). Independent sample *t*-tests indicated that total PCL:YV scores did not significantly differ between males and females ($p > .05$).

Criminogenic Risk Factors

Descriptive information for each risk factor from different domains of functioning is reported in Table 5.1. Substance use included separate measures of the age of onset of alcohol and drug use as well as eight dichotomized items (alcohol, marijuana, hallucinogens, ecstasy, cocaine, heroin, crack cocaine, and crystal meth) used to create an aggregate scale of self-reported substance use. Scale reliability was high (0.88) based on the tetrachoric ordinal alpha value, which is more reliable than Cronbach's alpha for dichotomous items (Gadermann et al., 2012). School behavior issues included the age at which participants began getting into trouble at school, the age at which they started skipping school, the number of times that they changed schools, and whether they were attending school prior to their incarceration. Abuse experiences included dichotomous self-report measures of whether the youth had experienced physical abuse and sexual abuse. Sexual activity was measured as the age of onset of consensual sexual activity. Personality development was measured using Schneider's (1990) Good Citizen's Scale, a self-report inventory of 15 identity traits coded on a 1-7 scale (Cronbach's alpha = 0.74).

Items on this scale were coded so that lower scores indicated a negative identity. Aggression was assessed by asking participants about the frequency of their involvement in physical fights, whether the participant felt they got angry easily, and whether the participant reported that someone had told them they had a bad temper. To measure familial delinquency and disruption, participants were asked to report whether any of their biological parents or biological siblings had trouble with alcohol and/or drugs, had experienced physical and/or sexual abuse, had a criminal record, or had mental illness. These six items were aggregated into a global scale (tetrachoric ordinal alpha = 0.78). Residential mobility measured whether the participant had left home willingly for more than a day to live somewhere else, whether the participant had been kicked out of their home for more than a day, whether the participant was raised by their biological parents, and whether the participant lived in foster care or other forms of ministry care.

Measures of Offending

All measures of offending were based on official data from British Columbia Corrections' computerized system, Corrections Network (CORNET), which contains information on an offender's movement in and out of custody as well as the exact criminal offense, date of conviction, and sentence type received. CORNET data includes only offenses committed within the province of British Columbia, meaning that if a participant committed new crimes outside of the province, nothing in the data could account for these offenses. The primary focus within the current study was on examining violent criminal careers. Using data from CORNET, every type of violent criminal charge that resulted in a conviction was coded for the entire sample from age 12, the age of criminal responsibility in Canada, to age 28. A violent offense was defined as any offense that involved physical contact or use of a weapon to threaten physical harm. Uttering threats was not included in the operationalization of a violent offense because of the relative ubiquity of this crime-type. Sexual offenses, although violent, were also treated as distinct crime-type given prior interest in comparing differences between sexual offenders and violent offenders (Cale et al., 2015; Lussier, Corrado, & McCuish, 2015). Types of violent offenses in this study included assault, assault with a weapon, aggravated assault, and manslaughter/murder.

As an indication of the extent of violence involvement among this sample, approximately 85% of the sample received a conviction for some form of violent crime and approximately 36% committed at least one violent crime in both adolescence and adulthood. This latter finding is helpful for understanding why recidivism is too broad of an offending outcome for this sample. Indeed, the average offender in this sample was convicted of nearly three violent crimes (see Table 7.1). As an indication of the severity of the types of violent crimes committed, 20 offenders (6.1%) had been charged with murder or manslaughter during the study period. For this sample, the average number of non-violent charges that resulted in conviction was 20.51 (SD = 16.55). The median number of non-violent convictions was 17.00, showing that the higher number of convictions was not an artefact of a small subgroup of individuals. Total time spent in custody was also calculated in order to control for exposure time in the semi-parametric group-based model (SPGM). On average, offenders spent 1,166 days in custody (SD = 1,167). The average frequency of violent and non-violent offending at each age is presented in Figure 7.1.
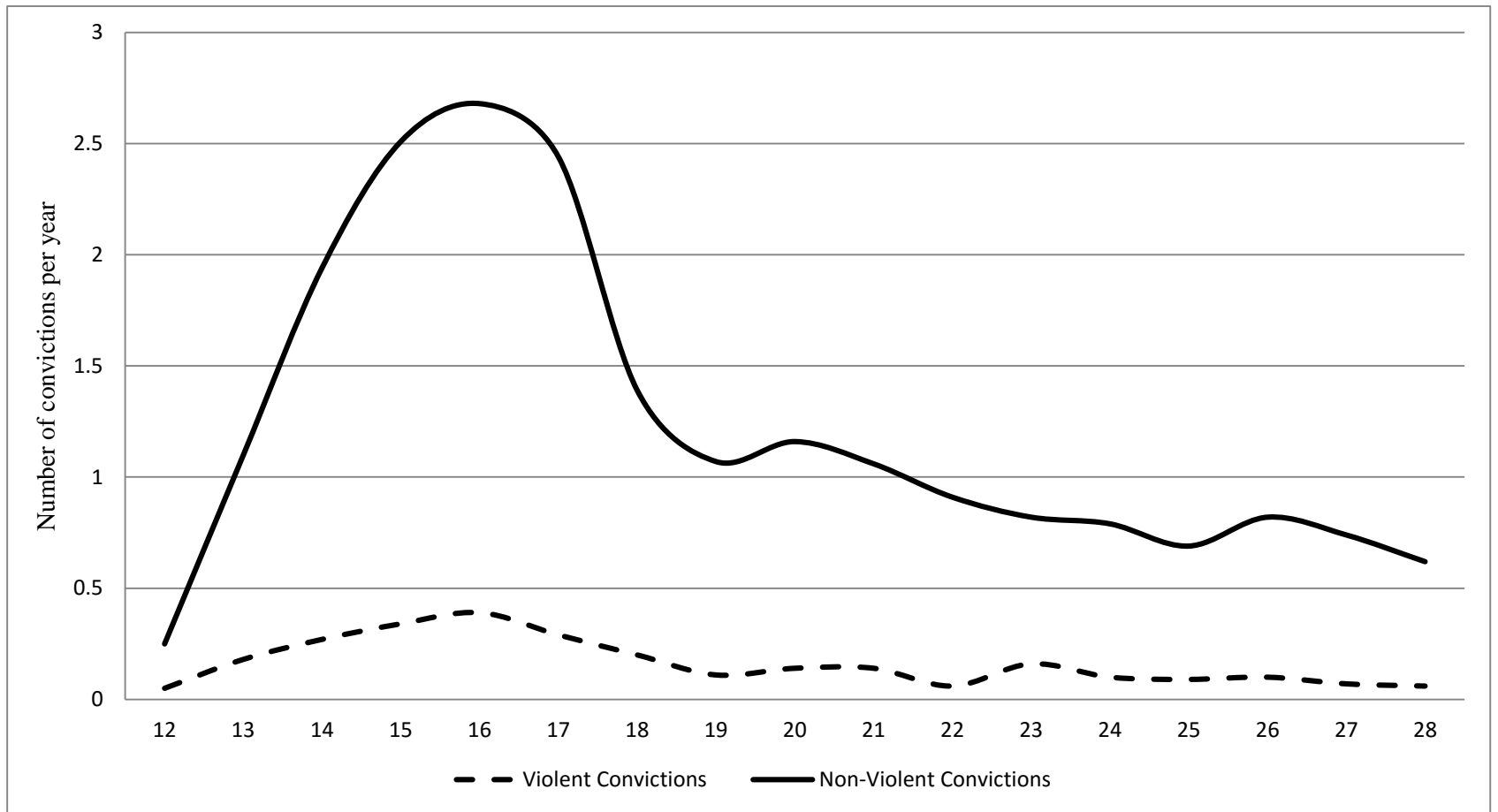
Figure 7.1: Distribution of violent and non-violent offending convictions from age 12-28

7.2.4.   Analytic Strategy

SPGM, developed by Nagin and Land (1993), was used to identify the number and shape of violent and non-violent offending trajectories that best fit the data. Analyses were conducted in SAS 9.4 using the Proc TRAJ add-on developed by Jones, Nagin, and Roeder (2001). Separate trajectories of violent and non-violent offending were modeled simultaneously using the joint trajectory modeling extension (Nagin & Jones, 2007). Trajectories were measured using all violent and non-violent convictions incurred at each age-period from ages 12 to 28. During this period, eleven offenders died (3.4% of the sample) and six (1.8%) moved outside the province. Convictions for these offenders after the age of death or move were coded as missing (see Eggleston et al., 2004). Unlike cluster analysis and other grouping methods that identify groups *ex ante*, the SPGM method allows developmental trajectories to emerge from the data (Nagin, 2005). To control for time at risk, exposure time was built into the SPGM model by adapting Piquero et al.'s (2001) original formula. This adaptation adjusted for high standard errors and improbable rates of offending by inflating the minimum exposure time[37] to a value of 0.2:

$$\text{Exposure}_{ji} = 1 - (\text{Number of Days Incarcerated}/455)$$

where j is the respondent and i is the year of observation.

In SPGM, the functional form of the trajectories is specified to estimate the distribution of offenses over age. Quadratic functional form specifies a more parsimonious distribution that captures one major change in the patterning of an offending trajectory over time. Cubic functional form specifies a more complex distribution that captures two major changes in the patterning of offending (Bushway, Thornberry, & Krohn, 2003). To illustrate, if a trajectory was marked by a steep decline in level of offending followed by a steep increase, a model that specified quadratic functional form would only adequately capture the steep decline. In effect, specification of quadratic functional form risks mis-labeling persisters as desisters. Cubic functional form seemed more appropriate for the current study. When modeling general offending trajectories, if an offender is involved in

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[37] The minimum exposure time (0.20) equates to spending approximately three months in the community if the offender was incarcerated for one year.

a period of chronic property offending followed by a period of chronic violent offending, both offending patterns are captured by the general offending trajectory. In contrast, if this same pattern of offending occurred when modeling *only* violent offending trajectories, a period where an individual did not stop offending but committed only property offenses would result in an indication that the offender was desisting from violent offending, when in reality this was simply a period of intermittency prior to an offender continuing to commit violent offenses. A model with quadratic functional form thus would not capture the increase in violent offending after a period of frequent non-violent offending. Although this offending pattern scenario is highly specific, offenders from the Philadelphia Birth Cohort typically transitioned from early versatility to greater specialization (Piquero, Paternoster, Mazerolle, Brame, & Dean, 1999). Early versatility means that an offender may engage in a violent offense, then several property offenses, then a drug offense, then a violation of a court order. If this offender then transitioned to a period of violence specialization, a model with quadratic functional form may not capture the upturn in violence characterized by this offender's true trajectory. Ensuring that these transitions were captured by the SPGM analysis was critical to accurately describing both violent and non-violent trajectories among the sample.

After identifying the number and shape of violent and non-violent offending trajectories that best fit the data, attention was given to whether chronic violent offenders were all simply chronic general offenders, or whether a specific subgroup of violent offenders emerged that seemed to specifically engage in a disproportionate number of violent offenses. Following this, in a series of bivariate analyses attention was given to the association between violence trajectories, symptoms of psychopathy, and criminogenic factors. All significant criminogenic risk factors and measures of PPD were then included in a series of multinomial logistic regression analyses, controlling for the non-violent offending trajectories, to examine whether these factors helped predict a particular course of violent offending.

7.3. Results

7.3.1. Model Identification and Interpretation

The first stage of the SPGM analysis involved identifying the number and shape of violent and non-violent offending trajectories that best fit the data. A zero-inflated Poisson (ZIP) model with cubic functional form was used to estimate the distribution of violent and non-violent offending trajectories. Bayesian Information Criteria (BIC) values were used to identify the number of trajectories that best represented the data. Similar to prior studies examining joint trajectories, the same number of violent and non-violent trajectories were specified for each model (e.g., Brame et al., 2001). A five trajectory-group model resulted in a BIC value of -10233, which was closer to zero than both a four group model (BIC = -10255) and a six group model (BIC = -10421). BIC values for a five group solution with quadratic functional form were further from zero (BIC = -10378) compared to the model with cubic functional form, despite the quadratic model being the more parsimonious model. To further examine the fit of the five group cubic model, Jeffrey's scale of evidence based on the Bayes factor approximation was used to determine whether there were substantive differences in BIC values between models specifying a different number of trajectories (see Nagin, 2005). The Bayes factor is calculated as $e^{BICi - BICj}$ where values of B_{ij} greater than ten indicate strong evidence for model 'i' according to the Jeffrey's scale (Nagin, 2005). The five group model was retained as there was strong evidence for this model over both a four group model and a six group model ($B_{ij} > 10$).

The parameters of the five group model are outlined in Table 7.2. Classification accuracy, based on the average posterior probability of accurately assigning individuals to a particular trajectory, was good for each of the five violent trajectories (range 0.79-0.92) and non-violent trajectories (range 0.87-0.94). Odds of correct classification (OCC) values, which are a more conservative estimate of trajectory assignment compared to average posterior probabilities, were calculated as:

$$OCC_g = (AvePP_g/ (1-AvePP_g)) / (\textstyle\prod_g/ (1-\textstyle\prod_g))$$

where $\prod_g$ is the estimated size of group g (see Skardhamar, 2010).

OCC values for the five violent trajectories ranged from 3.7-11.4 and the values for the five non-violent trajectories ranged from 6.6-15.4 (see Table 7.2). Nine of the ten OCC values were higher than both Nagin (2005) and Skardhamar's (2010) recommendation that values of at least five be interpreted as an indicator of excellent classification accuracy.

Table 7.2: Fit statistics for dual trajectory zero-inflated poisson model ($n = 326$)

	Violent trajectory model					Non-violent trajectory model				
	Bell-Shaped $n = 77$	EOFD $n = 100$	Stable Persister $n = 75$	HRC $n = 19$	HRSD $n = 55$	Low-Rate $n = 81$	Bell-Shaped $n = 89$	HRC $n = 41$	Stable Persister $n = 70$	SRC $n = 45$
Model parameters										
Intercept	-31.29	-36.47	72.48	22.34	-26.29	35.06	56.44	-18.22	-19.74	-23.79
Linear	6.84	6.05	-10.87	-3.38	2.93	-5.28	9.43	3.41	3.31	3.56
Quadratic	-0.44	-0.32	0.52	0.16	-0.08	0.27	-0.49	-0.18	-0.17	-0.16
Cubic	0.01	0.01	-0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Model fit										
Peak age	16	14	15	14	16	17	15	14	16	16
Mdn. probability	0.97	0.98	0.93	0.9	0.84	0.98	0.99	1.00	0.96	1.00
Range	0.53-1.00	0.30-1.00	0.45-1.00	0.46-1.00	0.42-1.00	0.53-1.00	0.26-1.00	0.41-1.00	0.50-1.00	0.55-1.00
Avg. probability	**0.92**	0.05	0.00	0.00	0.00	**0.93**	0.07	0.00	0.00	0.00
Avg. probability	0.06	**0.89**	0.02	0.02	0.05	0.05	**0.91**	0.00	0.01	0.00
Avg. probability	0.01	0.01	**0.88**	0.04	0.09	0.00	0.01	**0.93**	0.05	0.02
Avg. probability	0.00	0.01	0.03	**0.84**	0.07	0.01	0.01	0.05	**0.87**	0.04
Avg. probability	0.01	0.03	0.07	0.11	**0.79**	0.00	0.00	0.02	0.06	**0.94**
OCC	11.4	8.0	7.3	5.0	3.7	13.2	10.0	12.9	6.6	15.4
Non-violent trajectory	% (n)	% (n)	% (n)	% (n)	% (n)					
Low-rate	100.0 (77)	0.0 (0)	0.0 (0)	0.0 (0)	7.3 (4)	-	-	-	-	-
Bell-shaped	0.0 (0)	88.0 (88)	0.0 (0)	0.0 (0)	1.8 (1)	-	-	-	-	-
High-rate chronic	0.0 (0)	12.0 (12)	0.0 (0)	47.4 (9)	36.4 (20)	-	-	-	-	-
Stable persister	0.0 (0)	0.0 (0)	44.0 (33)	52.6 (10)	49.1 (27)	-	-	-	-	-
Slow-rising chronic	0.0 (0)	0.0 (0)	56.0 (42)	0.0 (0)	5.5 (3)	-	-	-	-	-

Note. EOFD = Early-Onset Fast Desister; HRC = High-Rate Chronic; HRSD = High-Rate Slow Desister; SRC = Slow-Rising Chronic

Figure 7.2 presents the violent trajectory model and Figure 7.3 presents the non-violent trajectory model. Beginning with the violent trajectories, a bell-shaped trajectory (23.6% of the sample) represented a group of offenders who were involved in violent offending at a very low rate and for only a short period between age 12 and 28. For this group, desistance began shortly after age 16 and reached a near-zero rate of offending by age 20. A group of early-onset fast desisters (EOFD; 30.7% of the sample) had the second highest rate of violent offending between age 12-14. However, by age 17, this group had the lowest rate of violent offending of the five trajectories. A group labeled stable persisters (23.0% of the sample) peaked at age 15, although this peak was relatively low compared to other trajectories. However, the offenders associated with this trajectory showed minimal decline from this peak between ages 15 and 28. A high-rate chronic group (HRC; 5.8% of the sample) averaged a higher rate of violent offending at age 12 than the bell-shaped, EOFD, and stable persister trajectories at their highest rate of offending from age 12-28. However, a sharp decline in violent offending was observed for the HRC group as they entered late adolescence and early adulthood. Through the mid-twenties; however, fluctuations in the rate of violent offending were observed. This course of this trajectory speaks to the importance of specifying cubic functional form[38]. Finally, the high-rate slow desister (HRSD) trajectory (16.9% of the sample) had the highest rate of violent offending for any particular year compared to all other trajectories (see age 16 in Figure 7.2). By early adulthood, this group's involvement in violence was relatively low, but remained stable through age 28. In effect, the HRC and HRSD trajectories represented two trajectories characterized by persistent involvement in violence, but the trajectories took on different shapes.

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[38] There is concern in the trajectory literature that cubic functional form creates an unnatural 'uptick' in offending trajectories (Blokland et al., 2005). In the case of the current study, the HRC trajectory averaged 0.33 convictions at age 28. Therefore, the HRC group's 'uptick' at age 28 was not created artificially by the nature of cubic functional form.
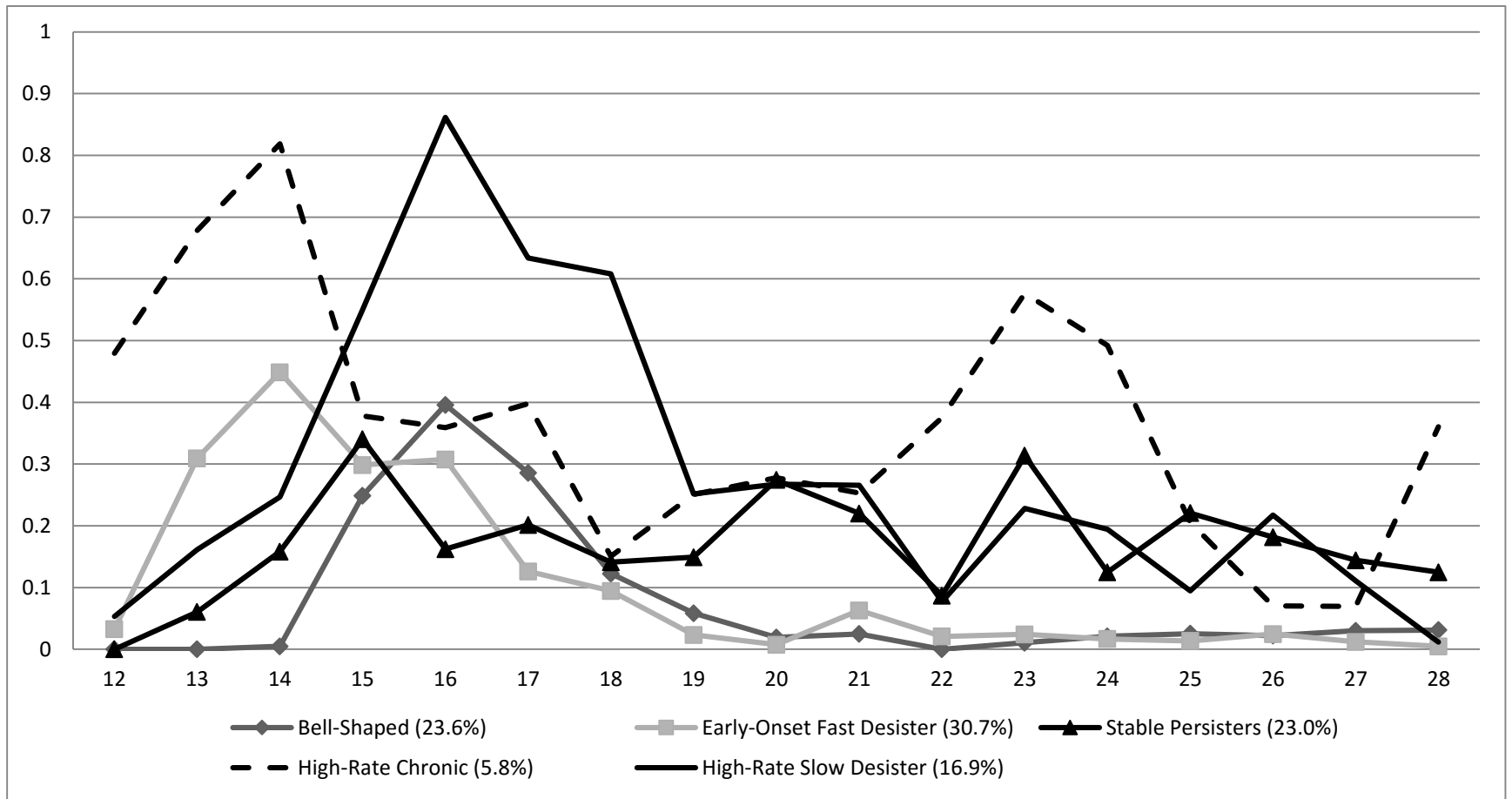
Figure 7.2: Trajectories of violent offending from age 12 to 28 (*n* = 326)

The shapes of the non-violent trajectories (Figure 7.2) were highly similar to the shapes of the general offending trajectories identified in Chapter Five that used the same sample of offenders. A low-rate group (24.8% of the sample) never averaged more than one non-violent conviction through the study period. By approximately age 18, this group reached a near-zero rate of offending. A bell-shaped non-violent trajectory (27.3% of the sample) also reached a near-zero rate of offending by age 18, but unlike the low-rate group, this group averaged at least one non-violent conviction at each person-period observation between age 13 and 17. A non-violent stable persister group (21.5% of the sample) mirrored the shape of the violent stable persister trajectory, but non-violent offenses were committed at a higher rate. Similar findings were observed for the high-rate chronic (HRC) non-violent trajectory (12.6% of the sample), which mirrored the HRC violent trajectory, but non-violent convictions were committed at a higher rate over each year. Finally, a slow-rising chronic (SRC) non-violent trajectory was observed (13.8% of the sample) that continued to offend through adulthood at a high rate. As the primary interest in the current study was on violent offending trajectories, subsequent analyses were focused on this portion of the joint trajectory analysis.
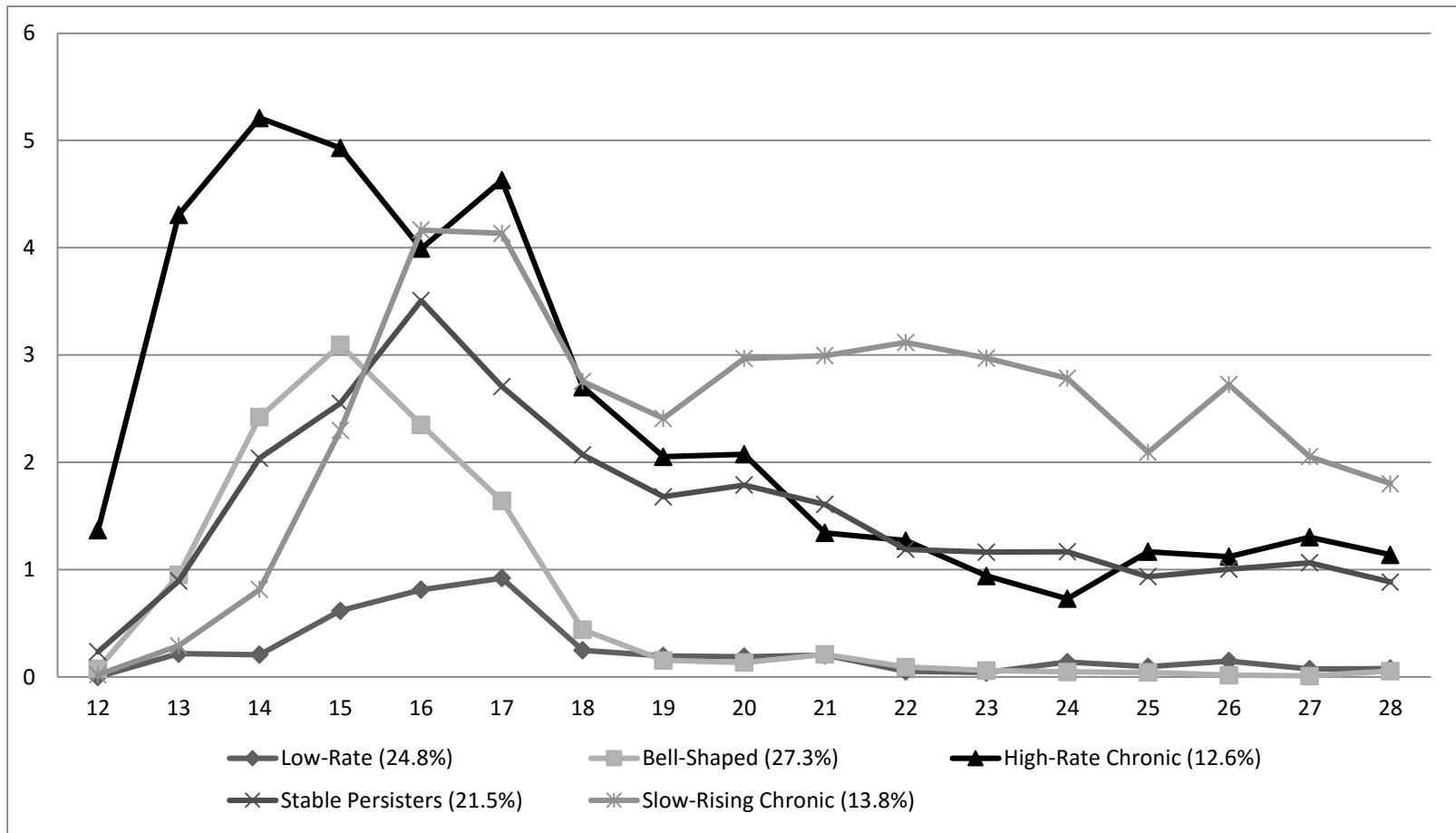
Figure 7.3: Trajectories of non-violent from age 12 to 28 (n = 326)

7.3.2. Association between Violent and Non-violent Trajectories

Of the trajectories in Figures 7.2 and 7.3, four were interpreted as indicative of 'chronic' offending: the HRC and HRSD trajectories in Figure 7.2, and the HRC and SRC trajectories in Figure 7.3. Chi-square analyses were used to examine whether chronic violent offenders were simply chronic general offenders. As can be seen at the bottom of Table 7.2 (see above), individuals assigned to the two chronic violent trajectories were not necessarily also assigned to the two chronic non-violent trajectories. Indeed, less than 50 percent of violent HRC and HRSD offenders were in the non-violent HRC and SRC trajectories. The majority of chronically violent offenders were assigned to the stable persister non-violent trajectory. It was also clear that many offenders associated with chronic non-violent trajectories were not also associated with either of the two chronic violent trajectories (e.g., this group showed continued non-violent offending but desisted from violent offending).

To reflect this finding in subsequent analyses, the trajectories of violent and non-violent offending were combined to create four joint trajectories. The first group, referred to as the Low Violence/Low Non-Violence (Low-V/Low-NV) trajectory (60.7% of the sample), included offenders associated with both a low rate violent offending trajectory (i.e., one of the bell-shaped, EOFD, or stable persister trajectories) and a low rate non-violent offending trajectory (i.e., one of the low-rate, bell-shaped, or stable persister trajectories). The second group, referred to as the Low Violence/High Non-Violence (Low-V/High-NV) trajectory (16.6% of the sample), included offenders associated with one of the low rate violent offending trajectories as well as one of the high rate non-violent offending trajectories (i.e., one of the HRC or SRC trajectories). The third group, referred to as the High Violence/Low Non-Violence (High-V/Low-NV) trajectory (12.9% of the sample), included offenders associated with one of the high rate violent trajectories (i.e., one of the HRC or HRSD trajectories) as well as one of the low rate non-violent offending trajectories. The fourth group, referred to as the High Violence/High Non-Violence (High-V/High-NV) trajectory (9.8% of the sample), included offenders associated with both a high rate violent trajectory and a high rate non-violent trajectory.

The four joint trajectories differed on several criminal career parameters, which helped validate the decision to merge different violent/non-violet trajectories (see Table 7.3). The three groups comprised of at least one chronically violent or non-violent trajectory (Low-V/High-NV, High-V/Low-NV, or High-V/High-NV) all averaged a significantly greater number of days in custody compared to the trajectory group without any chronically violent/non-violent offenders (Low-V/Low-NV). The High-V/Low-NV and High-V/High-NV trajectories also averaged a significantly earlier age of onset of offending compared to the Low-V/Low-NV trajectory. The Low-V/High-NV trajectory averaged the most non-violent convictions, significantly more than the Low-V/Low-NV and High-V/Low-NV trajectories. In contrast, the High-V/Low-NV trajectory averaged the most violent convictions, significantly more than the Low-V/Low-NV and Low-V/High-NV trajectories. The High-V/Low-NV group was also the most likely to show a pattern of continued violent offending from adolescence to adulthood. Very importantly, the Low-V/High-NV trajectory averaged a significantly greater number of general convictions compared to the High-V/Low-NV trajectory, showing that high rate violent offenders were not necessarily the most frequent general offenders. It could be argued that this finding resulted from forcing high rate violent offenders into a lower-rate non-violent offending trajectory. However, overall, looking at average number of general convictions for all high rate violent offenders (excluding those that were also high rate non-violent offenders) compared to all high rate non-violent offenders (excluding those that were also high rate violent offenders) revealed that this latter group averaged a significantly ($p < .001$) greater number of general convictions (44.69 versus 29.67). Moreover, even when high rate violent offenders that were also high rate non-violent offenders were added to the high rate violent offender group, the high rate non-violent offender group still averaged a statistically significantly ($p < .001$) greater number of general convictions (44.69 versus 35.76, respectively). Significant differences between joint trajectories also emerged regarding demographic characteristics, symptoms of psychopathy, and criminogenic risk factors.

Table 7.3: Combined violent and non-violent trajectories and association with other criminal career parameters

	Combined trajectories				
	Low Violence/ Low Non-Violence n = 198 m (sd)/ % (n)	Low Violence/ High Non-Violence n = 54 m (sd)/ % (n)	High Violence/ Low Non-Violence n = 42 m (sd)/ % (n)	High Violence/ High Non-Violence n = 32 m (sd)/ % (n)	χ^2/F, p, φ / η^2
Offense history					
Days in custody[†]	641 (890)[bcd]	2,017 (920)[a]	1,701 (1295)[a]	2,275 (949)[a]	$F^*(3)$= 44.1, p < .001, η^2 = .33
Age of onset	14.73 (1.49)[cd]	14.33 (1.34)[d]	13.88 (1.52)[a]	13.14 (1.78)[ab]	$F(3)$= 12.1, p < .001, η^2 = .11
Non-violent frequency[†]	11.19 (9.65)[bcd]	41.33 (13.38)[ac]	24.14 (11.29)[abd]	38.28 (12.22)[ac]	$F^*(3)$= 118.8, p < .001, η^2 = .58
Violence frequency[†]	1.84 (1.73)[cd]	2.35 (2.12)[cd]	5.41 (3.02)[ab]	5.22 (2.65)[ab]	$F^*(3)$= 34.5, p < .001, η^2 = .32
Total convictions	13.30 (10.69)[bcd]	44.69 (14.84)[ac]	29.67 (12.98)[abd]	43.75 (12.66)[ac]	$F(3)$= 138.8, p < .001, η^2 = .11
Continuity of violence	21.2 (42)	33.3 (18)	81.0 (34)	75.0 (24)	$\chi^2(3)$ = 76.7, p < .001, φ = .49

Note. [a] = significantly different from Low-V/Low-NV; [b] = significantly different from Low-V/High-NV; [c] = significantly different from High-V/Low-NV; [d] = significantly different from High-V/High-NV.
[†] Levene's test of equal variance violated; Brown-Forsythe statistic (F*) interpreted.

7.3.3. Joint Trajectories, Symptoms of Psychopathy, and Criminogenic Risk Factors

Initial bivariate comparisons were made between the joint trajectories (see Table 7.4). Males were significantly more likely than females to be in the High-V/Low-NV, Low-V/High-NV, and High-V/High-NV trajectories. Non-Caucasian/non-Aboriginal offenders were the least likely to be involved in the High-V/Low-NV, Low-V/High-NV, and High-V/High-NV trajectories. Importantly, symptoms of psychopathy, based on the four factor model of the PCL:YV, were significantly higher among the three joint trajectories comprised of at least one chronically violent or non-violent trajectory compared to the Low-V/Low-NV trajectory. However, only the High-V/Low-NV trajectory had significantly higher scores on the three factor PCL:YV model compared to the Low-V/Low-NV joint trajectory. Equally important, the High-V/Low-NV trajectory also had significantly higher scores on the affective facet of the PCL:YV compared to the Low-V/Low-NV trajectory. This latter finding is incredibly important given that that previous research typically only observes a relationship between lifestyle/antisocial facets and offending (see Chapter Five; Corrado et al., 2004; Walters, 2003). Scores on the antisocial facet of the PCL:YV were significantly higher among the three joint trajectories comprised of at least one chronically violent or non-violent trajectory compared to the Low-V/Low-NV trajectory.

Different domains of criminogenic risk factors emerged as more or less important for different joint trajectories. Risky lifestyles and local life circumstances seemed to best characterize the High-V/High-NV trajectory. This group, compared to the Low-V/Low-NV trajectory, had an earlier onset of both skipping school and sexual activity, as well as the highest prevalence of fighting on a weekly basis. The High-V/High-NV trajectory also had the highest scores on the family disruption scale, though differences between the other groups only trended toward significance ($p < .10$). The Low-V/Low-NV and Low-V/High-NV trajectories did not differ on any risk factor measures. Scores on the scale measuring positive identity were significantly higher for the Low-V/Low-NV trajectory compared to the High-V/Low-NV trajectory. Interestingly, the trajectories that included chronically violent or chronically non-violent offenders were not necessarily characterized by an increased likelihood of being associated with a particular risk factor or a higher intensity of certain

risk factors. For example, the prevalence of sexual abuse was highest amongst the Low-V/Low-NV group, although differences between groups only trended towards significant.

Table 7.4: Combined trajectory groups and their association with psychopathy and other criminogenic risk factors

	Low Violence/ Low Non-Violence m (sd)/ % (n)	Low Violence/ High Non-Violence m (sd)/ % (n)	High Violence/ Low Non-Violence m (sd)/ %(n)	High Violence/ High Non-Violence m (sd)/ % (n)	χ^2/F, p, φ / η^2
Male	73.7 (146)	90.7 (49)	85.7 (36)	96.9 (31)	$\chi^2(3)$ = 15.5, p < .001, φ = .22
Caucasian	54.6 (106)	66.7 (36)	69.0 (29)	78.2 (25)	$\chi^2(3)$ = 9.1, p < .05, φ = .17
Aboriginal	25.8 (50)	27.8 (15)	19.0 (8)	21.9 (7)	$\chi^2(3)$ = 1.3, n.s., φ = .06
Other ethnicity	19.6 (38)	5.6 (3)	11.9 (5)	0.0 (0)	$\chi^2(3)$ = 13.3, p < .01, φ = .20
Psychopathy symptoms					
Four factor model	18.10 (5.75)[bcd]	20.40 (5.55)[a]	22.51 (5.46)[a]	22.71 (4.02)[a]	F(3)= 12.5, p < .001, η^2 = .10
Three factor model	11.64 (4.49)[c]	12.92 (4.57)	14.37 (4.55)[a]	13.77 (3.93)	F(3)= 12.5, p < .01, η^2 = .05
Interpersonal factor	2.85 (2.02)	2.98 (1.98)	3.66 (2.06)	3.19 (2.13)	F(3)= 1.9, n.s., η^2 = .02
Affective factor	4.10 (1.99)[c]	4.33 (2.07)	5.17 (1.97)[a]	4.91 (1.71)	F(3)= 4.4, p < .01, η^2 = .04
Lifestyle factor	4.69 (2.03)[b]	5.58 (2.00)[a]	5.54 (2.00)	5.68 (1.61)	F(3)= 5.5, p < .01, η^2 = .05
Antisocial factor[†]	6.46 (2.35)[bcd]	7.50 (1.81)[ad]	8.14 (1.69)[a]	8.94 (1.01)[ab]	$F^*(3)$= 29.3, p < .001, η^2 = .15
Criminogenic factors					
Onset – alcohol use	11.97 (2.33)	12.23 (1.72)	12.06 (1.73)	11.40 (1.87)	F(3)= 0.8, n.s., η^2 = .01
Onset – drug use	11.86 (2.23)	11.83 (2.06)	11.50 (1.88)	11.34 (2.19)	F(3)= 0.7, n.s., η^2 = .00
Substance use versatility	4.26 (2.13)	4.86 (2.03)	4.12 (2.07)	4.04 (2.14)	F(3)= 1.5, n.s., η^2 = .01
Enrolled in school	52.3 (103)	38.5 (20)	50.0 (21)	54.8 (17)	$\chi^2(3)$ = 3.5, n.s., φ = .10
Onset-skip school	12.62 (1.89)[d]	11.83 (2.30)	12.24 (1.58)	11.12 (1.90)[a]	F(3)= 5.5, p < .01, η^2 = .06
Onset- school trouble	9.99 (3.25)	9.47 (2.88)	9.69 (2.93)	8.58 (3.00)	F(3)= 1.7, n.s., η^2 = .102
# of different schools	6.12 (6.56)	7.12 (6.33)	6.10 (4.77)	6.36 (5.06)	F(3)= 0.4, n.s., η^2 = .00
Physical abuse	49.7 (95)	36.5 (19)	41.5 (17)	56.7 (17)	$\chi^2(3)$ = 4.1, n.s., φ = .11
Sexual abuse	27.6 (54)	18.4 (9)	15.8 (6)	9.7 (3)	$\chi^2(3)$ = 7.1, n.s., φ = .15
Age sexually active	13.33 (1.68)[d]	12.79 (1.43)	12.78 (1.38)	12.11 (1.95)[a]	F(3)= 5.3, p < .01, η^2 = .05
Positive self identity	70.96 (9.76)[c]	69.11 (8.99)	64.95 (7.91)[a]	67.05 (9.72)	F(3)= 5.3, p < .001, η^2 = .05
Fighting- weekly basis	21.9 (39)	37.3 (19)	35.1 (13)	40.7 (11)	$\chi^2(3)$ = 8.6, p < .05, φ = .17
Angers easily	53.4 (102)	59.6 (31)	57.5 (23)	71.4 (20)	$\chi^2(3)$ = 3.5, n.s., φ = .11
Bad temper	71.9 (138)	82.7 (43)	75.0 (30)	79.3 (23)	$\chi^2(3)$ = 2.9, n.s., φ = .10
Family disruption scale	2.37 (1.69)	2.63 (1.42)	2.70 (1.64)	3.22 (1.40)	F(3)= 2.5, n.s., η^2 = .03
Left home	75.4 (144)	71.2 (37)	80.5 (33)	86.7 (26)	$\chi^2(3)$ = 3.0, n.s., φ = .10
Kicked out of home	48.1 (90)	39.2 (20)	45.0 (18)	43.3 (13)	$\chi^2(3)$ = 1.4, n.s., φ = .07
Raised by parents	66.7 (126)	60.8 (31)	58.5 (24)	73.3 (22)	$\chi^2(3)$ = 1.6, n.s., φ = .07

Note. [a] = significantly different from Low-V/Low-NV; [b] = significantly different from Low-V/High-NV; [c] = significantly different from High-V/Low-NV; [d] = significantly different from High-V/High-NV.

[†] Levene's test of equal variance violated; Brown-Forsythe statistic (F^*) interpreted.

7.3.4. Covariates of Joint Violent and Non-Violent Trajectories

Demographic characteristics, measures of PPD, and all significant criminogenic factors from Table 7.4 were entered into a series of multinomial logistic regression (MLR) analyses. This allowed for an examination of whether symptoms of psychopathy increased the risk of involvement in one of the two chronic violent joint trajectories, controlling for other important demographic and criminogenic factors (see Table 7.5). Given the controversy surrounding the theoretically appropriate number of factors underlying the PCL:YV (Cooke & Michie, 2001; Forth et al., 2003), three separate models were produced to examine the predictive utility of the four factor structure, three factor structure, and the four individual facets: interpersonal, affective, lifestyle, and antisocial. Multicollinearity was not an issue as all correlations between the covariates included in the models were lower than 0.400. Moreover, when all covariates were entered into a linear regression model predicting frequency of violence, variance inflation factor values were all less than two. Gender was not included as a control variable in any of the three models because of the low base rate of females in the chronically violent trajectories. Ethnicity was dichotomized as Caucasian or non-Caucasian due to the low base rate of non-Aboriginal and non-Caucasian offenders in the High-V/High-NV trajectory.

With the Low-V/Low-NV trajectory as the reference category, all three models were statistically significant (see Table 7.5). Regardless of whether a four factor model, three factor model, or individual factors were examined, scores did not differ between the Low-V/Low-NV trajectory and the Low-V/High-NV trajectory. In effect, symptoms of psychopathy were unrelated to being a chronic offender if this type of offender desisted from violent offending in adulthood. In Model 1, controlling for other criminogenic risk factors, the PCL:YV four factor model significantly increased the odds of membership in the High-V/Low-NV (OR = 1.16) and High-V/High-NV (OR = 1.17) trajectories compared to the Low-V/Low-NV trajectory. In Model 2, controlling for other criminogenic risk factors, the PCL:YV three factor model significantly increased the odds of membership in the High-V/Low-NV (OR = 1.18), but not the High-V/High-NV trajectory, compared to the Low-V/Low-NV trajectory. Keeping in mind that the High-V/Low-NV trajectory was the most frequently violent trajectory group but not the most frequent general offending group, this

finding is particularly important from a criminal career paradigm perspective. In effect, stronger symptoms of psychopathy increased the odds of membership in a trajectory where violent offending was not only more frequent but also disproportionately engaged in by individuals associated with this trajectory.

In Model 3, when other criminogenic risk factors were controlled for, only the antisocial facet was significant. Scores on this factor significantly increased the odds of being in the High-V/High-NV trajectory compared to the Low-V/Low-NV trajectory (OR = 2.36). The lack of a relationship between other PCL:YV facets and combined trajectories may have been due to shared variance between the four factors. When the four facets were entered separately, still controlling for the other criminogenic factors in the model, multiple differences emerged (not shown). Specifically, higher scores on the interpersonal and affective facets increased the odds of membership in the High-V/Low-NV trajectory compared to the Low-V/Low-NV trajectory (OR = 1.34, 1.37, and 1.37, respectively). In addition to symptoms of psychopathy, two criminogenic risk factors remained significant in the three models in Table 7.5. In each of the three models, a one unit increase in scores on the positive self-identity scale were associated with a six percent decrease in the odds of membership in the High-V/Low-NV trajectory (OR = 0.94). An earlier onset of skipping school was also associated with increased odds of being in the Low-V/High-NV trajectory and the High-V/High-NV trajectory relative to the Low-V/Low-NV trajectory.

Table 7.5: Coefficients of risk factors by combined trajectories (*n* = 326)

	Model 1			Model 2			Model 3		
	Low Violence/ High Non-Violence	High Violence/ Low Non-Violence	High Violence/ High Non-Violence	Low Violence/ High Non-Violence	High Violence/ Low Non-Violence	High Violence/ High Non-Violence	Low Violence/ High Non-Violence	High Violence/ Low Non-Violence	High Violence/ High Non-Violence
Covariates	OR	OR	OR	OR	OR	OR	OR	OR	OR
Controls									
Caucasian	1.38	1.27	2.25	1.36	1.21	2.38	1.46	1.26	2.69
Psychopathy									
Four factor model	1.06	**1.16**[**]	**1.17**[**]	-	-	-	-	-	-
Three factor model	-	-	-	1.06	**1.18**[**]	1.11	-	-	-
Interpersonal	-	-	-	-	-	-	0.93	1.18	1.03
Affective	-	-	-	-	-	-	1.09	1.23	1.06
Lifestyle	-	-	-	-	-	-	1.16	0.98	0.94
Antisocial	-	-	-	-	-	-	1.11	1.26[+]	**2.36**[**]
Criminogenic factors									
Onset- skip school	0.83[+]	0.93	**0.71**[**]	**0.82**[*]	0.92	**0.70**[**]	0.84[+]	0.92	**0.71**[*]
Onset- sexual activity	0.92	1.07	1.01	0.90	1.03	0.92	0.95	1.06	1.00
Positive self identity	0.99	**0.94**[*]	0.97	0.99	**0.94**[*]	0.97	1.00	**0.94**[*]	0.98
Fighting- weekly basis	1.01	1.47	1.42	1.08	1.66	1.54	0.99	1.36	1.04
Model Fit	-2LL = 423.68, df = 18, p<.001			-2LL = 429.98, df = 18, p<.001			-2LL = 407.70, df = 27, p<.001		

Note: Low Violence/Low Non-Violence = reference group.

[+] p < .10, [*] *p* < .05, [**] *p* < .01, [***] *p* < .001. All significant OR do not contain zero based on 95% CI.

7.4. Discussion

Research on offending trajectories is quite common (Jennings & Reingle, 2012; Piquero, 2008), as is research on the relationship between psychopathic personality disturbance (PPD) and offending (DeLisi, 2005, 2009; Edens, Skeem, Cruise, & Cauffman, 2001; Gretton et al., 2004; Hare, McPherson, & Forth, 1988; Salekin, 2008). Yet, the former research often does not examine risk factors underlying trajectories and the latter research is typically concerned with violent recidivism rather than describing desistance/persistence in the form of offending trajectories. The purpose of the current study was to help merge these two lines of empirical study by examining whether PPD and other covariates were associated with long term patterns of violence. Using the joint trajectory modeling extension for Proc TRAJ (Nagin & Jones, 2007), five violent and five non-violent trajectories were identified, and then these trajectories were combined to create joint trajectories of violent and non-violent offending. Of the two violence trajectories characterized by a high level of violence, one was also associated with a high rate of non-violent offending (the High-V/High-NV trajectory), whereas the other high rate violence trajectory was associated with a lower rate of non-violent offending (the High-V/Low-NV trajectory). Thus, in contrast to some earlier assertions (Capaldi & Patterson, 1996; Farrington, 1991, 1998), being a chronic violent offender did not necessarily imply that the offender was also involved in chronic non-violent offending.

For offenders associated with a chronic violent trajectory, distinguishing this group on the basis of their involvement in non-violent offending was important for understanding the relationship between symptoms of psychopathy, measured using the PCL:YV, and violent offending. As another indication of the need for specific explanations of persistent violent offending, the association between PPD and persistent violence was not simply due to violent offenders having a tendency to be involved in a high rate of general offending. Results from the multinomial logistic regression analysis indicated that scores on the PCL:YV three factor model significantly increased the odds of membership in the High Violence/Low Non-Violence trajectory compared to the Low Violence/Low Non-Violence trajectory. Equally important, scores on the PCL:YV three factor model were not significantly higher for the High-V/High-NV trajectory compared to the Low-V/Low-NV

trajectory. This finding was consistent with the postulation made in Chapter Five that PPD is a better indicator of persistent violence than of a high rate of general offending. In effect, the higher overall PCL:YV scores that were observed when comparing the High-V/Low-NV trajectory to the Low-V/Low-NV appeared to be driven by the antisocial facet, implying a tautological concern, where past involvement in violence (measured by the antisocial facet) predicted involvement in future violence. Thus, offenders with higher symptoms of psychopathy seemed to have a specific proclivity for involvement in violent but not non-violent offending (i.e., the High-V/Low-NV trajectory), which is further support for the need for specific theories, models, and explanations of persistent violent offenders. To help move the field beyond prediction of persistent violence and toward explanation, situational action theory is revisited in the next section, and specific symptoms of psychopathy are linked to key concepts from this theory.

7.4.1.   Explaining why Persistent Violence Occurs: The Role of Specific Symptoms of Psychopathy

Although it is clear that situational action theory is an event-based theory of violence, as Cullen (2011) asserted, more research is needed regarding the nexus between propensity (e.g., the individual) and opportunity (e.g., the event). Symptoms of psychopathy seem to be a particularly useful covariate for illustrating this connection. Specifically, the three core conditions of this event-based theory: propensity, low deterrence, and situational context (Wikström & Treiber, 2009) are all seemingly influenced by symptoms of psychopathy. As psychopathy is asserted to be relatively stable, these conditions will likely remain present over the life course, thus serving as a barrier to desistance from involvement in violence. In Figure 7.4, the symptoms of psychopathy that are hypothesized to influence the presence and magnitude of these three conditions are outlined. Symptoms were identified from prototypicality studies aimed at identifying the core features of the psychopathy construct (Cooke et al., 2012; Hoff et al., 2012; Kreis & Cooke, 2011).

Regarding individual propensity, a sense of entitlement and intolerance towards others may provide conceptual grounds for the moralistic component of propensity as described by Wikström and Treiber (2009). Behavioral styles associated with impulsivity,

disruption, recklessness, and aggression were identified, conceptually, as symptoms that may increase the low self-control component of propensity (Wikström & Treiber, 2009). The persistent symptoms of impulsivity associated with psychopathy are contrary to the expectation of some desistance theories that, with age, offenders mature (Maruna, 2001) or become biologically different (Gottfredson & Hirschi, 1990). In effect, the expectation that offenders will 'grow out' of their impulsive behavior or undergo some form of a cognitive transformation is inconsistent with what is known about psychopathy.

In terms of situational context, it was hypothesized that an interpersonal style characterized by domineering, manipulative, and antagonistic symptoms would have such an effect on an individual's environment as to create conditions conducive to violence. Cognitive deficits such as inflexibility and suspiciousness, and emotional deficits such as a lack of emotional stability were also included, as these symptoms may be associated with poor coping strategies even when the degree of conflict in an individual's environment is low. These interpersonal deficits combined with emotional dysregulation may also be associated with failure to gain or benefit from turning points such as marriage and employment. These latter life events have long been hypothesized to play a central role in the desistance process (Blokland et al., 2005; Sampson & Laub, 2003). For example, Laub and Sampson's (2003) qualitative accounts of key turning points among males from the Glueck study highlighted the positive value of a caring and supportive marriage partner. Yet, individual's scoring high on the PCL:YV are often uncommitted in their relationships, engage in impersonal sexual relationships, fail to take responsibility for their actions, and lack long term goals. These qualities are likely not conducive to the classic description of key life course turning points.

Finally, individuals with sensation seeking tendencies, a sense of invulnerability, and a lack of forethought are unlikely to recognize external forms of deterrence. Instead, these symptoms allow offenders to act on offending opportunities without hesitation. Moreover, deterrence is likely to be low for individuals that are unconcerned with how their actions may have negative consequences for others. Therefore, affective deficits (e.g., being detached, uncommitted uncaring, unempathic, and uncommitted) and emotional deficits (e.g., lack of anxiety and lack of emotional depth) were specified as being conceptually related to low levels of deterrence. Regarding this latter point, as Cusson

and Pinsonneault (1986) pointed out, deterrence was central to their theory of desistance. Given what is known about prototypical symptoms of psychopathy, it is therefore expected that traditional deterrence-based philosophies of desistance will likely be unsuccessful for individuals with strong symptoms of psychopathy.

```
Symptoms Influencing Propensity:

    -   Sense of entitlement
    -   Inflexibility
    -   Impulsivity
    -   Disruptive
    -   Recklessness
    -   Aggression
```

```
Symptoms Influencing Situational
            Context:
    -   Domineering
    -   Manipulative
    -   Antagonistic
    -   Intolerance
    -   Suspiciousness
    -   Lack of emotional stability
```

```
Symptoms Influencing Deterrence:

    -   Sensation seeking
    -   Sense of invulnerability
    -   Lack of planfulness
    -   Detached
    -   Uncommitted
    -   Uncaring
    -   Unempathic
    -   Uncommitted
```

```
Persistent Violent
    Offending
```
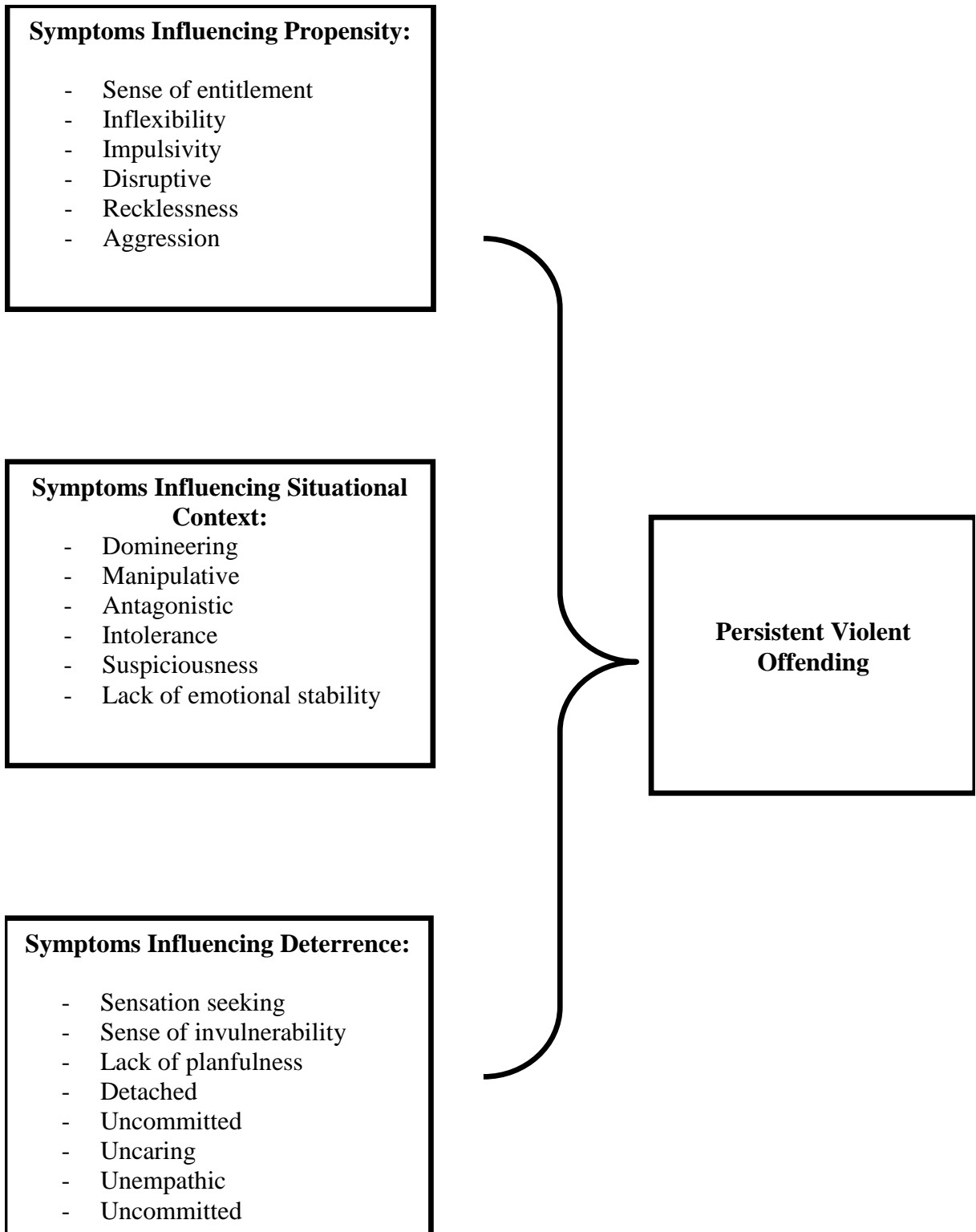
Figure 7.1: Conceptual outline of CAPP symptoms mapping onto situational action theory conditions for involvement in violence

It is important to re-emphasize that the specification of these symptoms is purely conceptual and the symptoms described should not be considered an exhaustive list of those contributing to propensity, situational context, or lack of deterrence. To test situational action theory, event-based data is needed. This means focusing on why a specific offense occurred, as opposed to examining an individual's frequency of violent offending over the life course. Thus, nothing in the current data could have been used to test this theory. The purpose here was simply to demonstrate how symptoms of psychopathy appear particularly conducive to involvement in persistent violence given their association with the propensity, deterrence, and situational contexts described in situational action theory (Wikström & Treiber, 2009). If this conceptual specification of the relationship between PPD, situational action theory conditions, and persistent violence is to be successfully examined in the empirical literature, some methodological issues associated with the current study need to be highlighted and addressed in future research.

7.4.2. Limitations and Future Research

Although the PCL:YV is considered the 'gold standard' of the assessment tools, perhaps the standard is not set high enough and thus it is necessary to move towards an improved measure. Results of several prototypicality studies have indicated a much broader conceptualization of PPD than the PCL:YV's 20 items (Cooke et al., 2012; Hoff, et al., 2012; Kreis & Cooke, 2011). Being over-inclusive of the symptoms of psychopathy, rather than assuming that just 20 items comprise this construct, may lead to a fuller understanding of the relationship between PPD and offending. This concern was noted in both Chapter Five and Chapter Six. Findings from Chapter Six regarding the challenges associated with accounting for exposure time in SPGM, at least potentially, are informative of limitations of the analyses performed in the current study. Although SPGM can account for exposure time, in offender samples the combination of a high rate of offending with lengthy/frequent periods of incarceration leads to inordinate estimations of the rate of offending over each year. To avoid model estimation issues it is therefore necessary to artificially inflate the amount of time that individuals are exposed to the community (see van der Geest, Blokland, & Bijleveld, 2009). Due to this procedure; however, the rate of offending for individuals involved in the most serious offenses is likely underestimated. For example, a homicide offender may be sentenced to ten years in custody, but through

procedures that inflate exposure time, is treated as spending several months in the community each year without committing a new offense. Unless the homicide offense occurred at the end of this offender's criminal career, they are likely be associated with a lower-rate trajectory. Individuals with PPD and other high-risk individuals are perhaps most likely to be identified as this type of 'false desister' since they are most likely to be involved in serious offenses and spend more time in custody. Using symptoms of psychopathy to predict involvement in chronic offending trajectories will likely result in lower than expected effect sizes. In essence, a limitation of SPGM is that it cannot be assumed from the analysis that the most serious offenders have been classified as chronic offenders. Some of these serious offenders, regardless of their level of risk, will be associated with low-rate trajectories because of the analysis' inability to account for the full period of time that they are incarcerated. Alternative analytic strategies that involve the construction of 'seriousness' metrics may be helpful in this regard. For example, the average length of time spent in custody per crime committed could be measured at each year to create a trajectory of offending severity.

This sample of Canadian incarcerated adolescent offenders is very specific, and likely cannot be generalized to non-incarcerated populations. At the same time, the type of research questions addressed by this study could not have been accomplished with a population-based sample. A continuing problem in trajectory studies is the exclusion of female offenders, or a failure to identify which female offenders are involved in a high rate of offending. Future research should examine female offending trajectories separately from male offending trajectories to identify the female 'chronic' offender. Despite the limitations of the current study, the line of analysis taken was important given that very little is known about chronic violent offenders despite the serious harm they cause. It is not sufficient to simply understand that individuals with PPD are involved in violence. A deeper understanding of the symptoms of PPD contributing to different mechanisms associated with violence (e.g., propensity, situational context, deterrence) is required. The CAPP model of PPD may provide the complexity needed to specify the symptoms associated with these different mechanisms (see Chapter Three).

Chapter 8.

Re-Connecting the Three Studies to Desistance Research

8.1. A Review of Key Findings and Implications

Although the current study sampled from a population that does not represent the 'typical' offender, none of the three studies presented in Chapters Five through Seven included research aims that involved addressing questions about this typical offender. This sample consists of offenders at the 'deep end' of the justice system, which helps address the noted lack of longitudinal research on the types of offenders that present the greatest challenge to practitioners in the criminal justice system (Mulvey et al., 2004; Sweeten, Piquero, & Steinberg, 2013). Desistance is meant to be studied amongst serious offenders followed across multiple developmental periods (Kazemian, 2007) and the current dissertation addressed this research need. The studies in Chapters Five through Seven were the first to use symptoms of psychopathy, measured in adolescence, to help understand the unfolding of chronic, serious, and violent (CSV) offending trajectories. This line of analysis importantly indicated that incarcerated adolescent offenders scoring high on the PCL:YV were significantly less likely to be associated with a trajectory characterized by (1) desistance from general offending, (2) serious offending (via time incarcerated), and (3) violet offending. A description of the three studies, including the study questions, analytic strategy, key findings, and implications for research on desistance are outlined in Table 8.1.

Table 8.1: Summary of three studies on psychopathy and the development of offending from adolescence to adulthood

	Study Description		
	Chapter Five	**Chapter Six**	**Chapter Seven**
Study Aims	-Address three conceptual issues in prior trajectory research: (1) low base rates of serious offenders, (2) mis-specification of key risk factors, and (3) inattention to the distinction between proximal and distal risk factors	-Address issues regarding measurement of exposure time in Proc TRAJ -Measure serious as opposed to frequent non-serious crimes -Address conceptual argument that psychopathy more informative of serious offending than frequent offending	-Address whether chronic violent offending virtually requires involvement in chronic general offending -Examine whether symptoms of psychopathy influenced continued violent offending from adolescence through adulthood
Analytic Strategy	-Semi-parametric group-based modeling -Identify most serious offending trajectory -Multinomial logistic regression (MLR) analysis with psychopathy used to predict offending trajectories, controlling for criminogenic factors	-Semi-parametric group-based modeling -MLR analysis with psychopathy used to predict association with a trajectory characterized by a lengthy period of incarceration, controlling for criminogenic factors	-Joint trajectory model of violent and non-violent offending trajectories -Cross-tabulation of the proportion of chronic violent offenders that were also chronic non-violent offenders -MLR analysis with psychopathy used to predict violent trajectories, controlling for criminogenic factors and non-violent trajectories
Key Results	-Four offending trajectories identified -Higher symptoms of psychopathy predicted association with a chronic offending trajectory	-The most serious offenders are not always the most chronic offenders -Higher symptoms of psychopathy associated with a more serious offending trajectory	- Many chronic violent offenders were not chronic non-violent offenders -Higher symptoms of psychopathy most strongly associated with joint trajectory characterized by involvement in chronic violent offending but not chronic non-violent offending
Contribution to Desistance Research	-For individuals with high symptoms of psychopathy, crime did not decline with age/maturation, at least through emerging adulthood, contrary to expectations from Gottfredson and Hirschi (1990) and Maruna (2001). Also contradicted Laub and Sampson's (2001) life course desistance perspective; adolescent development important for adult offending outcomes	-Individuals with higher symptoms of psychopathy spend a greater amount of time incarcerated, increasing the likelihood of state dependent effects that may act as a barrier to desistance	-Factors typically deterring involvement in violence may not be present for individuals with high symptoms of psychopathy -Cusson and Pinsonneault's (1986) deterrence-based hypothesis may find less support amongst individuals with high symptoms of psychopathy

| Future Directions | -Different measures of psychopathy are needed that give greater attention to measurement of interpersonal/affective deficits
-Other strategies for measuring desistance (e.g., dynamic classification tables) | -Use of escalation measures to have a more developmentally-informed model of offending (e.g., individuals still in a process of escalation least likely to be heading towards desistance process) | -Integrate psychopathy within event-based theories of violence such as situational action theory. Examine whether the violent events of individuals with high symptoms of psychopathy occurred despite an appropriate situational context or despite the presence of deterrence factors |

8.2. Re-visiting the Integration of the Psychopathy Construct within Desistance Theories

Fox et al. (2015) illustrated the relative ease at which the psychopathy construct could be integrated within a variety of well-established developmental and life course criminology theories. Certain other theories, such as the general theory of crime (Gottfredson & Hirschi, 1990), however, were not well suited for the incorporation of the psychopathy construct. Incorporation of this construct requires axiomatic assumptions about the factors influencing onset, persistence, and desistance (e.g., Loeber & Le Blanc, 1990). Blokland et al. (2005) described certain classic criminological theories, including theories based on informal social control[39], as mono-causal theories. Such mon-causal theories likely do not have the flexibility for the incorporation of the psychopathy construct. Given that psychopathy is a personality disorder, its symptoms are expected to influence an individual's interactions with themselves, their environment, and others in a manner that is markedly different from how personality influences the general population (Cooke & Michie, 2001; Rutter, 1987). Mono-causal theories may not be appropriate for descriptions of desistance given that explanations of desistance for most offenders may not work for individuals with high symptoms of psychopathy given their unique pattern of functioning. As outlined in Table 8.1, the analyses in the current dissertation have implications for the efficacy of different theories of desistance. These concerns are expanded upon in the sections that follow.

8.2.1. Psychopathy and Maturation/Identity Change-Based Theories of Desistance

For Gottfredson and Hirschi (1990), the biological effects of aging are solely responsible for the observed decline in level of offending demarcated by the aggregate age-crime curve. However, in each of Chapters Five, Six, and Seven, individuals with

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[39] Although Fox et al. (2015) described how psychopathy could be integrated into informal social control theories (e.g., Laub & Sampson, 2001), it seems unlikely that Laub and Sampson (2001) would agree with this incorporation given their comments about informal social controls being able to explain both persistence and desistance (also see Blokland et al., 2005).

strong symptoms of psychopathy were typically involved in a stable level of offending after the typical decline in crime according to the age-crime curve (i.e., after the individual exits late adolescence/early adulthood). Regardless of whether the focus was on general offending, time incarcerated, or involvement in violent crimes, individuals with symptoms of psychopathy did not appear affected by biological effects of aging in a manner that promoted a slowing down in level of offending. Whether this is an indication that individuals with high symptoms of psychopathy are resistant to biological effects of aging, or whether the biological effects of aging are simply a mere correlate rather than cause of the decline in levels of crime over time (see Sweeten, Piquero, & Steinberg, 2013) was not verified in the current study.

Similarly, for those advocating that the role of identity change is central to the desistance process (Maruna, 2001), the age period covered in the current dissertation should have been sufficient to witness the process of desistance as a result of changes in identity. According to Arnett's (2000) description of emerging adulthood, from approximately age 18-25, new opportunities are presented that allow individuals to shape their identity in different ways. These identity changes are primarily related to perspectives on relationships, work, and worldviews. Regarding relationships, during emerging adulthood individuals begin to ask what they are looking for in a long-term partner. Regarding work, employment becomes less of a transient experience and individuals begin to look for occupations that can contribute to long-term goals and interests. Finally, regarding world views, individuals in emerging adulthood tend to become more open to new perspectives. Once individuals enter full or mature adulthood, change is less likely to occur (see Arnett, 2000).

As outlined in Chapter Three, prototypical symptoms of psychopathy seem particularly contrary to notions of identity change. Lack of long term goals and a lack of perseverance contradict the newfound emphasis on stable employment. A detached, uncaring, and uncommitted attitude towards others combined with more self-centered and entitled attitudes seem to be barriers to the desire to form lasting, meaningful, and mutually respectful relationships. Finally, an inflexible response style, intolerant attitudes towards others, and a lack of emotional depth combined with a belief that personal qualities require others to cater to them will very likely contribute to an unwillingness to alter personal views

of the world. Results from Chapters Five, Six, and Seven appear to confirm that adolescents with strong symptoms of psychopathy did not appear to undergo a process of change during emerging adulthood. Although not examining change in self-identity, the use of Schneider's (1990) Good Citizen Scale showed that regardless of an individual's self-identity, high symptoms of psychopathy still predicted chronic, serious, and violent offending. Future research examining repeated measures of self-identity should examine whether higher scores on measures of psychopathy are associated with a lack of within-individual change in identity during emerging adulthood. For desistance theories specifying the importance of cognitive transformation and identity change (e.g., Maruna, 2001), given that change is less likely to occur after the period of emerging adulthood, individuals continuing to offend after this period may be particularly less likely to show a pattern of desistance. Therefore, desistance occurring after this developmental period may require explanation of other desistance theories.

8.2.2.   Psychopathy and Rational Choice/Deterrence-Based Theories of Desistance

According to Cusson and Pinsonneault (1986), desistance is brought about by formal responses by the criminal justice system, including increased police surveillance and the challenges of dealing with incarceration, including difficult doing the time, spending lengthy periods of time incarcerated, worrying about getting caught, and worrying about the impact of incarceration on other life domains. Findings from Chapters Five, Six, and Seven all indicate that individuals with high symptoms of psychopathy consistently come into contact with the justice system with little sign of being deterred by prior involvement. Chapter Six is most clearly indicative of the lack of an effect that incarceration has on deterring individuals with strong symptoms of psychopathy. Specifically, through the late stages of an individual's twenties, time incarcerated commonly remained high and stable for individuals scoring high on the PCL:YV. As shown in both Chapters Five and Six, individuals scoring high on the PCL:YV were not only more likely to spend more time in custody, they were more likely to receive lengthier sentences per each crime committed. In effect, individuals with high symptoms of psychopathy were receiving the harshest sentences yet least likely to show signs of desistance, very much in contrast with Cusson and Pinsonneault's (1986) perspective. For future research

examining deterrence perspectives on desistance, attention should be given to measuring where perceptions of punishment and fear of punishment vary across individuals with or without strong symptoms of psychopathy.

8.2.3. Psychopathy and Life Course-Based Theories of Desistance

The current study did not have repeated measurements of risk and protective factors and therefore it was not possible to test classic life course theories describing the manner in which informal social controls that are acquired over time work to promote a desistance process (e.g., Laub & Sampson, 2001). All three studies in the current dissertation did have adolescent measures of informal social control (connection to school and family), and symptoms of psychopathy remained associated with chronic, serious, and violent offending controlling for these factors. Future research should examine (a) whether individuals with high symptoms of psychopathy are likely to get married, employed, or have children. This research should also examine the quality of these informal social controls and whether individuals with high symptoms of psychopathy spend less time in these roles compared to others. Another important question is whether individuals with high symptoms of psychopathy benefit from turning points such as marriage. For example, given these individuals tend to be uncaring, detached, uncommitted, and lack empathy and remorse (Kreis et al., 2012), it is difficult to foresee scenarios in which these individuals care about how their actions may jeopardize their bonds with others.

Also important to life course theories/theorists is the notion of state dependence/cumulative disadvantage. Here, persistent involvement in crime leads to an attenuating connections to sources of informal social control (Sampson & Laub, 1997). Incarceration, which is typical for individuals with strong symptoms of psychopathy, essentially creates a 'knifing off' from opportunities to maintain sources of informal social control or find new sources. There are also reciprocal effects, where repeat incarceration also has labeling effects that diminish adult social bonds (Sampson & Laub, 1997). Chapter Three discussed how individuals with strong symptoms of psychopathy likely showed little concern for, as an example, their relationships with others. Chapter Six in particular indicated that individuals with strong symptoms of psychopathy may also be

particularly prone to labeling effects due to lengthy and frequent periods of incarceration. Moreover, some individuals in the sample with strong symptoms of psychopathy as per research assistant ratings on the PCL:YV may also have received similar but 'official' ratings from practitioners within the criminal justice system. The negative effects of labeling an adolescent with a high score on a measure of psychopathy (Edens et al., 2001) may additionally contribute to cumulative disadvantage that prolongs continued offending over the life course.

8.2.4. Psychopathy and Developmental-Based Theories of Desistance

Understanding the role of heterotypic continuity is key to describing the unfolding of psychopathy symptoms over time (Blonigen, Hicks, Krueger, Patrick, & Iacono, 2006; Vitacco & Vincent, 2006). In the psychopathy literature, heterotypic continuity deals with the notion that expressions of symptoms of psychopathy will be different at different developmental stages. For example, in childhood, manifestations of callous and unemotional symptoms are expressed by a difficulty connecting and playing with peers, such as an unwillingness to share toys (Frick & Hare, 2001), in adolescence these same symptoms manifest as a disregard for the effect of overt antisocial behavior on their victims (Forth et al., 2003), and in adulthood these symptoms manifest as an inability to understand the emotional needs of a partner (Hare, 2003). Relying on heterotypic continuity to justify the adoption of developmentally appropriate tools to measure the same symptoms is supported by the lack of evidence for measurement invariance across developmental stages. Obradovic et al. (2007) found that measures of interpersonal callousness drawn from the Child Behavior Checklist (Achenbach, 1991) and the Teacher Report Form (Achenbach & Edelbrock, 1986) contained items that did not function to measure callous-unemotional (CU) traits in the same way over time. Specifically, factor loadings for individual items during childhood (8-11) differed compared to factor loadings in adolescence (12-16). In effect, symptoms of psychopathy manifest in different ways, but because these differences are age-based, different manifestation unfold in a relatively predictable/measurable manner. An interesting parallel can be drawn between the specification of the unfolding of symptoms of psychopathy and developmentalists' specification of the unfolding of criminal behavior.

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Heterotypic continuity is also taken into account as part of the long term assessment of antisocial behavior (see Moffitt & Caspi, 2001). According to developmental criminologists, different criminal career patterns unfold in a relatively predictable manner (Le Blanc & Loeber, 1998; Loeber & Le Blanc, 1990). This manifestation of different criminal career parameters is at least in part influenced by an individual's age. Thus, both manifestations of both crime patterns and symptoms of psychopathy are at least partially defined by age. To this point in the psychopathy literature, however, heterotypic continuity has been primarily viewed as a problem for the measurement of the construct and the generalizability of different instruments to different age stages. Consideration has not been given to whether changes in the expression of symptoms of psychopathy impact changes in the expression of antisocial or criminal behavior. One way to illustrate the developmental synchronicity of expressions of psychopathy symptoms and offending stages is to examine overlap between age-specific measurement tools associated with psychopathy and age-specific stages of offending specified by developmental criminologists (e.g., Loeber & Le Blanc, 1990). For example, is the transition from offending initiation to offending versatility influenced by changes in how symptoms of psychopathy manifest over time?

Loeber and Le Blanc (1990; also Le Blanc & Loeber, 1998) described activation as the first stage of offending. At this stage, the antisocial behavior of persistent offenders becomes more frequent and more diversified but also remains relatively non-serious (e.g., a lack of escalation). At this stage, persistent offenders are involved in a variety of authority conflict, covert, and overt forms of antisocial behavior[40] (Loeber & Hay, 1994). For most persistent offenders the emergence of this generalized behavior pattern begins prior to the teenage years (McCuish, Lussier, & Corrado, 2014). Quite similarly, personality characteristics that define symptoms of psychopathy at this late childhood/early adolescent stage are relatively broad and non-serious. For example, Frick and Hare (2001) developed the Antisocial Process Screening Device (APSD) to measure symptoms of psychopathy in early adolescence. Within this instrument, items such as 'keeps the same friends', 'is concerned about feelings and emotions', 'acts without thinking of the consequences', and 'engages in illegal activities' are all broad behavioral or personality

[40] The term 'antisocial' is used because very often these behaviors occur prior to the age at which an individual can be held criminally responsible for their behavior.

symptoms associated with psychopathy. Most factor analyses of the APSD reveal only two to three distinct factors (Fite, Greening, Stoppelbein, & Fabiano, 2009; Frick, Barry, & Bodin, 2000; Vitacco, Rogers, & Neumann, 2003), indicating that more specified/nuanced symptom clusters do not emerge at this stage. Moreover, scores from the APSD are associated with a greater frequency and variety of conduct problems (Christian, Frick, Hill, Tyler, & Frazer, 1997), which shows some synchronicity between broad measures of symptoms of psychopathy and broad measures of behavioral problems.

As persistent offenders begin to escalate as per Loeber and Le Blanc's (1990) second developmental stage of offending, crimes committed become more serious and more frequent. Similarly, descriptions of symptoms of psychopathy during middle and late adolescence tend to connote more serious implications for offending and require a more nuanced assessment (Forth et al., 2003). For example, whereas the APSD focuses on the broader category of 'engages in illegal activities' to address antisociality, the PCL:YV specifies involvement in more serious types of offenses to address antisociality (Forth et al., 2003). Further, whereas the APSD focuses on the broader category of 'engages in risk or dangerous activities', the PCL:YV requires a more specific investigation of the types of sensation seeking activities engaged in by the individual. For example, evidence of sensation seeking that extends to only one area of life functioning is not sufficient to receive a score of a '2' (i.e., 'item definitely applies'). Evidence that sensation seeking behavior extends to multiple domains of life functioning is necessary, as opposed to the APSD's more general concern for this style of behavior.

Finally, as chronic offenders enter the third stage of the criminal career, desistance (Loeber & Le Blanc, 1990), offending becomes less frequent and more specialized. Similarly, assessment of psychopathy during stages of adulthood begin to focus on more specific manifestations of psychopathy symptoms. For example, whereas the PCL:YV focuses on the lack of stable interpersonal relationships, both sexual and non-sexual in nature (Forth et al., 2003), the PCL-R focuses on the instability of marital relationships (Hare, 2003). In effect, symptoms are given a more specified description, in this case, a more specialized specified type of relationship. If manifestations of psychopathy symptoms become more specific, it is possible that this will translate to involvement in more specific forms of offending. Results from Chapter Seven are indirect support for this

assertion. One particular trajectory was observed where individuals were associated with continued violent offending during the later stages of the study period but showed a pattern of desistance from non-violent crimes during this same time period. More direct tests of this question should be addressed by examining whether psychopathy is associated with increased evidence of specialization through adulthood. In effect, increased specialization as a result of changes in manifestations of symptoms of psychopathy may be confused with an indication that a process of desistance is beginning to take place.

8.3. Towards a More Complete Understanding of Desistance

The current dissertation used data similar to the Pathways to Desistance Study (Mulvey, 2011), which is a study of incarcerated offenders followed longitudinally. A characteristic of the Pathways to Desistance Study missing from the current study was the use of repeated measures of different risk and protective factors. Measuring change or stability in risk and protective factors is critical for understanding stability or change in offending (Sweeten, Piquero, & Steinberg, 2013). To capture decline in the level of offending over time, Sweeten et al. (2013) asserted that four elements must be present. First, covariates must meaningfully vary over age in order to capture change. Second, the presence of the variable must be related, positively or negatively, to crime involvement across age. Third, the strength of the correlation between a particular variable and age must be similar to the strength of the correlation between that same variable and crime. Fourth, within-individual variation in a particular variable (i.e., evidence that a particular variable is more likely/less likely present over time) must be correlated with crime. For example, it is necessary to observe that individuals in a sample transition from many antisocial peers to fewer antisocial peers and that this change is associated with decreases in level of offending.

In effect, Sweeten et al. (2013) were able to model not just the process of desistance (i.e., the current study), they were also able to help account for why crime declined over time. Although the authors were not able to discuss cause/effect because it was possible that declines in crime produced declines in levels of risk factors, the findings provided a positive outlook for the assertion that declines in level of offending are not

simply a waiting game that requires offenders to age out of crime. In Sweeten et al.'s (2013) multilevel model they observed that the combination of several covariates, which measured elements from a variety of different theoretical perspectives, were able to account for 69% of the decline in their sample's level of offending from ages 15 to 25. The covariates included in Sweeten et al.'s (2013) model could be considered to capture both risk factors explaining persistence and protective factors explaining desistance. Sweeten et al. (2013) observed that declines in levels of social learning risk factors such as antisocial peer association and gang membership accounted for the greatest amount of variance in declines in level of offending versatility.

There are several future research avenues in need of exploration to expand on Sweeten et al.'s (2013) study. For example, their analysis examined declines in crime based on an assumption that the age-crime curve was invariant for all offenders. In other words, the effects of different risk and protective factors on changes in levels of offending were assumed to operate in the same way for all offenders. Developmental theories include two important implications not examined in this prior study. First, the impact of changes in risk/protective factors may vary across types of offenders according to different offending trajectories (Blokland et al., 2005). As indicated by Nagin et al. (1995), the age-crime curve is not invariant. Individuals associated with different offending patterns may respond differently to changes in levels of risk and protective factors. For some offenders it is possible that declines in the level of certain risk factors do not correspond with declines in level of offending. For example, an individual that is the recipient of poor parenting practices in childhood, which may have influenced their offending in adolescence, is less likely to report receiving poor parenting practices in their twenties. As such, levels of poor parenting practices should decline in adulthood, but it is not necessarily the case that offending will decline over this time too. A related question concerns asymmetrical causation. If the factors influencing onset or persistence do not also influence desistance or vice-versa (Blokland et al., 2005; Uggen & Piliavin, 1998) then even if changes in risk factors are correlated with age, they may not be correlated with offending over time. Finally, an additional requirement for modeling the decline in crime over time as specified by the age-crime curve is that covariates must meaningfully vary with age. This means that future analyses replicating or expanding upon Sweeten et al.'s (2013) work that seek to examine the role of psychopathy in declines in offending over time will first need to

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examine whether this construct remains stable between adolescence and adulthood. Conversely, if future research involves expanding upon the notion that psychopathy is a barrier to desistance, it will be necessary to show that there is a lack of within-individual change in this construct, especially during the period of early adulthood, when dramatic declines in offending are expected as per the age-crime curve.

8.4. Future Research

8.4.1. The Stability of Psychopathy

Putting forward the argument that a risk factor in adolescence helps to explain continued offending in adulthood requires making an assumption that (a) the risk factor will remain stable over time or (b) that the risk factor will have such a detrimental impact in adolescence that the offender's opportunities for turning points later in life are effectively nullified. In Chapter Five it was argued that symptoms of psychopathy remain relatively stable over the life course and therefore symptoms will continually influence involvement in crime. However, stability should be explained, not assumed, and whether psychopathy is stable across developmental stages remains empirically under-explored (Vincent, 2012) and also, at times, explored incorrectly (e.g., inattention to the role of measurement invariance in examining stability, failure to examine stability across more than one developmental period; see Bergstrom, 2014; Loney et al., 2007). Even with respect to adults, there has been a lack of research on the stability of psychopathy (Frick, Kimonis, Dandreaux, & Farrell, 2003). Such research requires sophisticated and costly longitudinal designs that allow for repeat measurement on the same participants, with the most effective studies spanning multiple developmental periods (Loney et al., 2007).Future research is needed to identify whether there is stability or change in the level of symptoms of psychopathy during the adolescence-adulthood transition, a critical phase of development for the shaping of identity in, at least, the general population (Arnett, 2000; Neumann, Wampler, Taylor, Blonigen, & Iacono, 2011; Salihovic, Ozdemir, & Kerr, 2014). The number of significant life changes occurring during this period is also believed to represent an ideal time for intervention (Seagrave & Grisso, 2002). Changing factors contributing to levels of psychopathy is considerably more difficult in adulthood (Pardini &

Loeber, 2008). A critical question is whether expected changes during emerging adulthood occur for a subset of the general population that enter emerging adulthood with high symptoms of psychopathy.

Answering questions about the stability of psychopathy is critical for both persistence and desistance research. Seagrave and Grisso (2002) argued that decreases in levels of psychopathy over time would essentially nullify the utility of the construct because this period of decline in symptoms would correspond with decreased involvement in crime. However, labeling of the adolescent as a 'psychopath' could still have serious stigmatizing effects (e.g., the perception that treatment will be unhelpful for this group) despite the lack of evidence for long-term risk. Such stigmatization may result in continued or even increased involvement in offending (Edens et al., 2001). In effect, lack of stability may be helpful in explaining desistance amongst individuals initially characterized by high symptoms of psychopathy, but the lasting effects of the psychopathy label may still act as a barrier to desistance. In contrast, if symptoms are stable over time, the psychopathy construct will be particularly influential on persistence, especially in circumstances where offenders do not to receive treatment for their symptoms. Very importantly, evidence for the stability of symptoms of psychopathy should not be taken as support for the withholding of treatment for this group (Frick, 2006). Indeed, although it is typically assumed that 'psychopaths' do not benefit from treatment, meta-analytic studies show otherwise (Salekin, 2002). For future research on the stability of psychopathy, questions to address include:

(1) Is there a correlation between an individual's score on the PCL:YV during adolescence and that same individual's score on the PCL-R during emerging adulthood?
(2) Do individuals scoring high on the PCL:YV during adolescence also score high on the PCL-R during emerging adulthood?
(3) To what extent do those scoring low on the PCL:YV score high on the PCL-R, and vice-versa?
(4) Do levels of stability of symptoms of psychopathy vary according to ethnicity or gender?
(5) Which risk factors help explain stability or increase in levels of psychopathy over time?
(6) Which protective factors help explain decreases in levels of psychopathy over time?
(7) What is the relationship between stability or change in levels of psychopathy and subsequent stability or change in levels of offending?

(8) Is the structure of psychopathy in adolescence the same as the structure of psychopathy in adulthood (i.e., configural invariance)?

(9) Are the 'core' features of psychopathy in adolescence different from core features of psychopathy in adulthood (i.e., metric invariance)?

8.4.2. The Need for more Nuanced Measures of Psychopathy

Although all three studies indicated that higher symptoms of psychopathy increased the odds of association with a more chronic, serious, and violent offending trajectory, when multivariate analyses reduced PCL:YV scores to the facet-level, the lifestyle and antisocial facets of the PCL:YV were primarily responsible for these relationships. The limited utility of the PCL:YV's interpersonal and affective facets is in line with Walters' (2004) concern that psychopathy has relatively little utility as a theoretical construct because essentially the facets explaining continued offending are comprised of symptoms analogous to low self-control. However, before arguing against the value of the broader psychopathy construct, a distinction must be made between psychopathy as a *construct* and the PCL:YV as a *measure* of this construct.

As first noted by Cooke et al. (2012), assertions about the limited theoretical value of psychopathy must consider whether the construct was inadequately captured by the measurement tools used within the studies receiving criticism. Contemporary measures of psychopathy were focused less on the relationship between personality symptoms and their use as a predictor of offending and more on offending as a symptom of the construct. Hare's focus was on adult incarcerated offenders, which seemed to influence the apparent emphasis of antisocial, particularly criminal, behaviors as symptoms of psychopathy rather than outcomes (Hare, 2003; Harpur, Hare, & Hakstian, 1989)[41]. Similarly, from a contemporary developmental criminology perspective, early developmentalists such as Robins (1978) linked early onset and persistent antisociality as a precursor to adult "sociopaths." Her perspective apparently was instrumental in specifying the centrality of the serious delinquent and criminal developmental pattern in defining antisocial personality disorder (APD) in different versions of the Diagnostic and Statistical Manual

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[41] Although Hare disagrees with this characterization of his measurement of psychopathy (Hare, 2003; Hare & Neumann, 2005; Hare & Neumann, 2010), others have noted that the PCL-R and PCL: YV rely heavily on behavioral indicators (Cooke & Michie, 2001; Cooke et al., 2007; Dawson et al., 2012; Skeem & Cooke, 2010).

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(DSM), including the most recent DSM-V, where psychopathy as a personality disorder has been subsumed under APD. In effect, Cleckley's (1979) description of psychopathy was considered by the appropriate DSM committees to not be sufficiently distinctive clinically compared to the behavioral-focused assessment of APD. This behavioral-based measurement of APD has remained within the DSM despite considerable empirical research that suggested that (a) the prevalence of DSM-based criteria for APD among incarcerated populations was so high that it was relatively unhelpful for differentiating offenders on the basis of risk and as a tool for determining intervention/treatment needs and (b) a lower than expected overlap between offenders with APD as well as high symptoms of psychopathy (Harpur et al., 1989; Hart & Hare, 1989; Skilling, Harris, Rice, & Quinsey, 2002).

For this reason, Hare's PCL-R and related instruments that provided measures of interpersonal and affective symptoms excluded from the DSM criteria for APD diagnoses moved to the forefront of research on the psychopathy construct. By the 1990s psychopathy and the "gold standard" PCL-R had become widely utilized in criminal justice settings, primarily in the United States as a risk assessment tool for recidivism and, more particularly, for dangerousness or violence. However, towards the start of the 21st century, several researchers from the field of clinical and forensic psychology were concerned that, although both the various PCL instruments as well as self-report measures influenced by the PCL-R (e.g., the Youth Psychopathy Traits Inventory; Andershed, Kerr, Stattin, & Levander, 2002) better captured interpersonal and affective deficits relative to DSM APD criteria, two issues persisted. First, Cooke et al. (2004) questioned whether the PCL fully captured the range of symptoms associated with psychopathy as a *personality* disorder. Second, others argued that PCL instruments were over-reliant on behavioral problems and specific antisocial acts that should instead be considered outcomes, not symptoms, of psychopathy (Cooke, Michie, & Skeem, 2007; Skeem & Cooke, 2010; Dawson, McCuish, Hart, & Corrado, 2012). In effect, this group of researchers suggested that the types of criticisms made by Walters (2004) concerning psychopathy as a different measure of low self-control was an issue of operationalism, where the PCL was being equated *as* psychopathy, rather than as a measure *of* psychopathy (e.g., Cooke et al., 2007).

The CAPP conceptual map of psychopathy appears to be suited to moving research towards a more personality-oriented measure of psychopathy (Corrado, 2012). Before studying a concept it is necessary to explicate this construct, and one approach is to develop a concept map (Cook & Campbell, 1979). Concept maps are graphical displays that outline the key elements of a construct and the relationships amongst these elements. Importantly, these definitions need to be precise and in line with the lexical approach (e.g., terms are encoded in natural language). Concept maps provide both the basis for research designed to validate the construct and the basis for the development of diverse measures of the construct. The CAPP was designed using a bottom-up approach to construct explication was undertaken (see Cooke et al. (2012) for details). Clinical and research literatures were reviewed, formal diagnostic criteria and tests of cognate concepts considered, and finally, semi-structured interviews were given to clinical experts to gather information about typical patients with this disorder and their most recent patient with this disorder. The information obtained was refined using a number of guiding principles. First, symptoms described personal pathology not social or cultural deviance. Second, symptoms were defined in atomistic terms, not in complex terms or through the combination of a variety of different terms. Third, symptoms were defined in natural language not in jargon or colloquial terms. Fourth, to emphasize the importance of stability of symptoms in the assessment of psychopathy, symptoms were defined in terms that reflect the fact that they could change. Fifth, three adjectival descriptors were assigned to each symptom to provide direction regarding the meaning of the initial symptom and ultimately lead to greater precision and depth of assessment. Sixth, and finally, based on the argument that redundant or less important symptoms could be culled if suggested necessary by data analysis, the developed concept map was comprehensive, potentially over-inclusive, to ensure nothing was missed. This is a substantial difference from the top-down approach used in the PCL-R, which involved assuming that the 20 items selected were, intuitively, the items that best represented the psychopathy construct

The CAPP concept map includes 33 symptoms rationally allocated into six conceptual domains that reflect basic functions of personality: attachment, behavioural, cognitive, dominance, emotion, and self. These domains are purely conceptual and are not meant to imply that the psychopathy construct is comprised of six 'domains.' The attachment domain (four symptoms) reflects problems with affiliative and affective

relationships and includes a lack of commitment and caring towards others. The behavioral domain (six symptoms) reflects problems with organization and self-control of voluntary or purposive behavior. Importantly, this domain de-emphasizes the role of criminal behavior because symptoms in this domain are to be scored without emphasis on the subject's current offense. The cognitive domain (five symptoms) reflects problems with cognitive style, beliefs, and executive functions. The dominance domain (six symptoms) reflects problems with relationships, including a manipulative, insincere, controlling, and garrulous interpersonal style. The emotion domain (five symptoms) reflects problems with the ability to experience and express basic emotions as well as demonstration of feigned, exaggerated, or unstable emotions. The self domain (seven symptoms) reflects problems with self-identify and self-concept, including a self-centered attitude and an incomplete sense of self. Each symptom from every domain is a trait-descriptive adjective or brief adjectival phrase that is, in turn, defined by three synonymous adjectives or adjectival phrases. For example, the three adjectival descriptors '*contemptuous*', '*disagreeable*', and '*hostile*' were used as three adjectival descriptors to better communicate the meaning of the symptom '*antagonistic*'. This additional level in the hierarchical models serves not only to facilitate communication but also to further clarify the intended meaning of the symptoms.

In addition to the CAPP conceptual model is the Comprehensive Assessment of Psychopathic Personality- Institutional Rating Scale (CAPP-IRS)[42]. The 33 symptoms of the CAPP are mapped onto the CAPP-IRS and scored on a seven-point scale from 0-6. With CAPP-IRS total scores ranging from 0-198, greater symptom variance is possible, which addresses Skeem et al.'s (2007) concern regarding the lack of symptom variation among individuals scoring 'high' on other measures of psychopathy. The CAPP-IRS was developed in line with the perspective that psychopathy is best described as a continuous construct within both youth (Edens, Marcus, & Vaughn, 2011; Murrie et al., 2007) and adults (Guay, Ruscio, Knight, & Hare, 2007; cf. Harris, Rice, Quinsey, 1994) and as such specific cut scores were not specified. To date the validity of the CAPP-IRS has been

[42] The 'CAPP-IRS' acronym refers to the specific interview and rating scale used in institutional settings, whereas the 'CAPP' acronym refers to the CAPP concept map of psychopathy described by Cooke et al. (2004). Measures and concepts are distinct; the CAPP-IRS is one of several methods for operationalizing the CAPP concept map.

assessed in two ways, through translation and through prototypicality analysis (Cooke et al., 2012; Hoff, Rypdal, Mykletum, & Cooke, 2012; Kreis & Cooke, 2011). A strength of the lexical or linguistic approach to mapping constructs is that it allows testing of the model through translation; the greater the distance from the source language (English) the more rigorous the test of the model (Saucier & Goldberg, 2001). Over twenty translations are complete (e.g., Norwegian, Spanish, Persian, Hungarian, Danish, Lithuanian, Russian, Hebrew, Korean). The overarching conclusion is that similar networks of trait descriptive adjectives represent psychopathy across these languages.

Translations have led to prototypicality studies. Such studies can evaluate the comprehensiveness of a model and also identify the features of the concept that are most central and which are closest to the margins of the concept (Blashfield & Livesley, 1991). Prototypicality studies of the CAPP were conducted across a number of languages with both professionals and laypeople. Kreis, Cooke, Michie, Hoff, and Logan (2012) carried out a prototypicality study using the original English version. One hundred and thirty-two mental health professionals rated the prototypicality of the 33 CAPP symptoms. Nearly all symptoms were viewed as highly or very highly prototypical of psychopathy; only three symptoms were rated as medium or low prototypicality (*unstable self-concept*, *lacks concentration*, and *lacks pleasure*). Hoff, Rypdal, Hart, Cooke, and Mykletun (2015) examined the domain structure of the CAPP model. Using a forced card-sort procedure they demonstrated that mental health workers and students allocated the symptoms to the six domains speedily and intuitively. Essentially, when prototypical studies were carried out with translations of the CAPP model (e.g., in Norwegian, Hoff et al., 2012; in German, Stoll, Heinzen, Köhler, & Huchzermeier, 2011; and Swedish, Sorman et al., 2014), identical results were achieved with both mental health professionals and samples of lay individuals. These studies support Cooke et al.'s (2004) initial conceptual description of the disorder. Across studies, at the domain level, the self, attachment, and dominance domains were regarded as most prototypical of the disorder. Except for a case study (Dawson et al., 2012) and a prototypicality study with results similar to those reported for adults (Clercx, Johnstone, Cooke, & de Ruiter, 2012), there is a complete lack of empirical analysis of the CAPP-IRS within an adolescent sample. Future research is needed that makes use of more encompassing measures of psychopathy and the association between

high scores on such instruments and offending outcomes from adolescence through adulthood.

8.4.3. Considering the Appropriateness of the Analytic Strategies Employed

The two main analyses used in the current dissertation (SPGM and multinomial logistic regression (MLR) analysis) were not the only options available for addressing the research questions under examination.

Analysis of Offending Trajectories

Regarding the trajectory analyses, Proc TRAJ is not the only software package designed to analyze offending trajectories. The statistical approach performed depends on whether researchers adopt the perspective that an individual's trajectory is best described as (a) the extent to which their individual age-crime curve varies from the sample's aggregate age-crime curve 'average' trajectory within a sample, with parameters following a known distribution (Bushway, Sweeten, & Nieuwbeerta, 2009) or (b) a continuous distribution approximated by a discrete category. The former is often referred to as hierarchical linear modeling (HLM; see Bryk & Raudenbush, 1992) or latent curve analysis (McArdle & Epstein, 1987) whereas the latter is known as semi-parametric group-based modeling (SPGM; Nagin & Land, 1993). HLM and latent curve modeling are not fundamentally the same analysis but they both share an important commonality regarding modeling variation in growth via continuous distribution functions, which is contrary to the specification of discrete clusters used in SPGM (Nagin, 1999).

All analyses in the current study were performed in the statistical package 'Proc TRAJ', which is used for SPGM. Relying on a single analytic strategy to make conclusions about the development of offending over time is not recommended (Nagin & Tremblay, 2005b). Whether the relationship between psychopathy and offending trajectories holds across a different method of analysis is an important question for future research. Eggleston et al. (2004) noted that the number of trajectories identified varied over time and, similarly, for the same individual, the trajectory that they had the highest probability of being associated with varied when the length of the follow-up period changed. The

SPGM approach has also been criticized based on the notion that constructing a finite number of distinct trajectories over-simplifies developmental processes by ignoring the interaction between the individual and their environment (Raudenbush, 2005). HLM and latent curve analysis take a different approach, where an individual's trajectory can be approximated by parameters from a continuous distribution, very often a normal distribution (Nagin, 1999). Although many of the issues with SPGM are also true of HLM, questions regarding the strength of both analyses need to be answered empirically as opposed to philosophically (Nagin & Tremblay, 2005b). As well, according to Nagin and Tremblay (2005b) because SPGM and these other methods also share many of the same principles, the different statistical approaches are not expected to produce varying results.

Using data from the Criminal Career and Life Course Study, Bushway, Sweeten, and Nieuwbeerta (2009) compared the efficacy of group trajectory models (GTM) and growth curve models (GCM), the latter being examined through HLM (Bryck & Raudenbush, 1987). In slight contrast to Nagin and Tremblay's (2005b) expectation, the two methods resulted in identifying a different set of offenders as desisters. This finding has quite important implications for understanding the causal factors associated with desistance because the type of factors identified may vary depending on the analytic strategy utilized to model desistance. Overall, however, Bushway et al. (2009) concluded that the substantial number of similarities between the two strategies should influence researchers to use the two methods to better understand the distribution of offending over time as opposed to describing the two as competing analyses for the same research question. One important distinction between analyses of relevance to the current study was that Bushway et al. (2009) found a higher prevalence of chronic offenders in the GCM analysis.

This latter finding may be partially related to the sample used and not solely a limitation of the analytic strategy. Bushway (2013) discussed the inappropriateness of GTM for identifying chronic offenders because this group is an outlier group that is too small to be identified in Proc TRAJ. As a consequence, individuals are 'assigned' to a trajectory that eventually shows a pattern of desistance. In effect, the inability for GTM to identify chronic or life course persistent offenders may be a result of the use of a sample where particularly serious offenders are less likely to be found. In Proc TRAJ, it may be

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necessary to study life course persistent offending using an incarcerated population to ensure that the small minority of chronic offenders is over-represented, allowing for the creation of their own trajectory instead of forcing a statistical compromise where a chronic trajectory cannot pass the Proc TRAJ parsimony test (i.e., BIC values do not indicate an improvement in model fit with the inclusion of a new trajectory). This may lead to the inclusion of offenders in a trajectory associated with desistance despite behavior that contradicts the common presumption of desistance. Fortunately, the prevalence of chronic offenders in the current study quite likely meant that statistical compromises in the model were avoided.

Multinomial Logistic Regression

Multinomial logistic regression (MLR) analysis is a popular analytic strategy commonly paired with SPGM (Jones et al., 2007). Unlike other forms of regression, this analysis does not assume normality, linearity, or homoscedasticity. One important assumption of MLR is the assumption of independent irrelevant alternatives. At first glance there could be concerns that the use of MLR in the context of Proc TRAJ would violate this key assumption. Specifically, the assumption holds that membership in one category versus another cannot be influenced by whether some alternative third category is present or absent (McFadden, Tye, & Train, 1977). In the context of the current dissertation, considering the trajectories in Chapter Five, membership in the slow rising chronic trajectory versus the slow desister trajectory cannot be influenced by the presence of absence of the bell-shape trajectory. Any effect can be examined by 'removing' the bell-shape trajectory and then evaluating whether membership in the slow rising chronic trajectory versus the slow desister trajectory actually changed.

Based on Bushway's (2013) description of SPGM, the trajectory to which an individual is 'assigned' may be determined through a process of default, where their assignment to that particular trajectory was determined on the basis that all other trajectories were of particularly worse fit. On the basis of this information, the individual's assignment to a particular trajectory would not pass the independence of irrelevant alternatives (IIA) assumption. An alternative to MLR is discriminant function analysis. However, the assumptions of this analysis are generally stricter and it is commonly assumed that the groups under investigation naturally occur. As part of the continued effort

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to avoid reification of trajectory groups (Nagin & Tremblay, 2005), discriminant function analysis may result in a step further away from this effort. Other analyses such as nested logit models could be considered, but assumptions also have to be made about the reality of the trajectory groups. It is not as simple as to begin with one trajectory choice and then determine whether sample participants do or do not belong to this group. If one trajectory is estimated, Proc TRAJ will treat each participant as having a perfect probability of membership in that group. Thus, a binary indication of fit is not possible, where those that did not fit the first model can then be given the choice of a second alternative trajectory. For now at least, MLR appears to be a more well-suited analysis for the examination of the relationship between different risk factors and offending trajectory group membership.

8.5. Policy and Treatment Implications

8.5.1. Responses to Dangerous Offenders and those with High Symptoms of Psychopathy

The long-term impact of psychopathy symptoms on different measures of offending trajectories raises the importance of early intervention strategies. Although a common presumption is that individuals with high symptoms of psychopathy do not benefit from treatment, or even worsen as a result of learning parroting techniques (Edens et al., 2001), the reality is that very few studies have properly examined the efficacy of treatment and intervention programs for adolescents characterized by high symptoms of psychopathy. One recommendation for increasing the likelihood of positive responses to treatment involves targeting specific symptoms as opposed to the broader psychopathy construct (Salekin, 2010). However, further research is needed that examine whether individuals scoring high on measures of psychopathy can be distinguished based on particular symptom profiles (Dawson et al., 2012). Until this research is available, initial strategies should include the targeting of *all* symptoms, followed by an evaluation of which symptoms changed or did not change over time. Additional consideration should be given to how this change or stability impacted an individual's level of offending over time. Following risk-need-responsivity principles (Andrews & Bonta, 2010), high intensity treatment programs show promise in reducing risk for violence even among youth offenders characterized by high symptoms of psychopathy (Caldwell, Skeem, Salekin, &

van Rybroek, 2006). Caldwell et al. (2006) noted that part of the explanation for low effect sizes in treatment outcome studies related to the tendency for individuals with high symptoms of psychopathy to be removed from treatment programs due to problematic behavior. Caldwell et al. (2006) recommended that programs respond to problem behavior with "continuous intensive treatment" (593) while simultaneously balancing safety issues. Programs may consider focusing on one-to-one treatment to avoid greater access to victims to antagonize or provoke.

In some rare cases, policy solutions designed to respond to the types of chronic offenders, serious offenders, and persistent violent offenders found in the three studies within this dissertation may involve the types of 'dangerous offender' legislation used in Canada. This legislation involves the specification of indeterminate sentences for offenders deemed by the court to have very little possibility of rehabilitation (Public Safety Canada, 2015). However, typically it is the case that such dangerous offenders already display a persistent pattern of involvement in serious and violent crime, sex offenses in particular. Indeed, the prevalence of antisocial personality disorder is high among this group and most began their criminal career in mid-adolescence. As such, these types of policies are more so applied to older offenders (Solicitor General Canada, 2001 [Lawrence MacAulay]). As such, even according to the most concerning trajectories, the offender associated with such a trajectory is, at this age, often in a process of slowing down their involvement in offending. The consequence is that selective incapacitation strategies become relatively futile; once the severity of an offender is recognized, their involvement in crime is already one characterized by a downward decline. As such, more proactive policy solutions are needed that involve higher-intensity interventions at earlier ages that balance both concerns for public safety as well as concerns about the negative impact of incarceration on the acquisition of informal social controls. Risk management instruments such as the Cracow Instrument should be examined as potentially useful in targeting a wide-range of risk and protective factors at different key developmental stages. Although implementation of the Cracow Instrument is challenging due to requiring of inter-agency willingness to engage in information sharing, recent validation studies support its use in predicting early involvement in physically aggressive behaviors (Lussier, Healey, Tzoumakis, Deslauriers-Varin, & Corrado, 2011).

8.5.2.   Harm Reduction Policies

There is something to be learned about the drug and alcohol use literature's recent movement away from advocating abstinence only models of treatment/intervention and towards more realistic and effective harm reduction policies (Marlatt, 1996). This movement is quite similar from recent interest from criminal career researchers in moving away from desistance as an event and towards desistance as a process (e.g., Lussier, McCuish, & Corrado, 2015). Despite this changing perspective concerning the definition of desistance, the effectiveness of an intervention or treatment strategy is typically judged on the basis of its ability to prevent recidivism (Farrington & Welsh, 2005; Miller & Miller, 2015). In harm reduction models, 'relapse' is often expected (Kellogg, 2003) and thus the efficacy of a particular harm reduction model is not judged solely based on prevention. Parallels can be drawn between the commonality of relapse for serious drug/alcohol users and the commonality of recidivism for serious offenders. Given that recidivism seems to be part of the desistance process (e.g., Maruna, 2001), it is perhaps time to re-frame how treatment programs are evaluated, especially when administered to particularly serious offenders.

As an illustration, for the offender with strong symptoms of psychopathy who is involved in nearly a dozen crimes in a given year, evaluating the efficacy of a treatment program based on this offender's complete termination from offending may be an unreasonable/unrealistic expectation. While undergoing treatment, it is acceptable to allow chronic offenders the goal of complete termination from offending. Like the harm reduction model, complete abstinence from offending is of course the desired outcome (Marlatt, 1996) and abstinence goals are not incompatible within harm reduction models (Lenton & Single, 1998). However, research on chronic alcoholics indicated that participants' goals were equally likely to be abstinence versus moderation. Over time, however, those that selected moderation were reflexive in their goal, with the majority choosing abstinence after four additional weeks in treatment (Hodgins, Leigh, Milne, & Gerrish, 1997). This movement from moderation to abstinence is very much in line with notions of desistance as a slowing down process. Moreover, other research shows that treatment outcomes are less likely to be met when it is the service provider or agency that defines the success of the treatment (Sobell & Sobell, 1995). Carrying these implications

over to the criminal justice system, forcing upon an offender the expectation that they will be able to, for example, strictly abide by a long list of probation conditions may be a design for failure. Practitioners will have to balance the findings from Sobell and Sobell (1995) with the risk of giving offenders the impression that there will not be repercussions for their behavior.

The above approach is consistent with what has recently been referred to as a 'gradualism' strategy (Kellogg, 2003). Here, a pathway between harm reduction and abstinence is drawn. Kellogg (2003) describes this pathway as beginning with harm reduction strategies of outreach to the addicted with an emphasis on gradual change and healing. This initial stage of the pathway helps build relationships between drug users and practitioners. This pathway then begins to enter a phase of therapy and emphasis on substance use as an obstacle to human growth. In effect, Kellogg (2003) refers to this approach as an "abstinence-eventually" model (243), which may be a model helpful for guiding treatment providers in the criminal justice system that are dealing with particularly challenging clients.

Importantly, not all aspects of harm reductions models need to be adopted. For example, whereas substance use treatment providers within a harm reduction model may recommend that a client simply moderate their alcohol use (Neighbors, Larimer, Lostutter, & Woods, 2006), criminal justice system practitioners likely would not be in favor of simply encouraging their client to moderate their offending behavior; the goal should be complete abstinence. However, evaluating the success of a treatment response should include consideration for whether the treatment provided lead to moderation in frequency or severity of offending. Marlatt (1996) noted that abstinence only policies restricted individuals from receiving treatment until they already showed evidence of abstinence. As a parallel, some continue to advocate against the use of treatment for individuals with psychopathy, based on concerns that the disorder is genetic and therefore cannot change (Davidson, 2015). The type of desistance strategy utilized for chronic offenders should very likely be different from the approach utilized for non-chronic offenders. This type of approach would be consistent with the World Health Organization's perspective that treatment responses for alcohol abuse should be fundamentally different from treatment responses for less serious forms of alcohol use (Marlatt & Witkiewitz, 2002). Importantly,

the rationale to move away from one-size-fits all treatment approaches is not based on different perspectives on what *causes* the use of alcohol. To draw comparisons to the criminological literature, even if research supports symmetrical causation (Piquero, Moffitt, & Wright, 2007), this alone does not justify using the same approach to promote desistance. Although evidence of asymmetrical causation (e.g., Uggen, 2002; Uggen & Piliavin, 1998) may be helpful for further specifying treatment needs, different approaches to desistance treatment, and the manner in which these strategies are evaluated, can be determined based on the frequency/severity of the offender.

Like the current study, trajectories of substance use have been examined. Witkiewitz (2005) described a trajectory of individuals with a turbulent drinking pattern in which this group frequently moving between periods where 100% of the trajectory was abstinent and back to periods where, by the next month, zero percent of the trajectory were abstinent. This pattern mirrors the intermittency parameter known to be common in the criminal careers of higher-rate offenders (D'Unger, Land, & McCall, 2002). Like substance use treatment providers who must be wary of relapses as part of a pathway to complete abstinence, criminal justice system practitioners will need to be wary of when recidivism is part of a continued trajectory of chronic offending versus part of a downward trajectory towards complete termination from offending. Newcombe (1992) constructed a matrix for outlining harm reduction goals. This matrix considers both individual and societal successes/failures over different periods of time (e.g., short and long-term) and with attention to the severity of the relapse. This approach may be helpful for better understanding the process of desistance and helpful for guiding practitioners attempting to interpret whether their client's recidivism should be considered a relapse as part of an overall pattern of desistance or whether their client's recidivism represented the continuation of a chronic, serious, or violent offending trajectory.

8.6. Conclusion

The three studies presented in this dissertation are hopefully a step forward to better understanding how symptoms of psychopathy contribute to chronic, serious, and violent offending. The results can be used to support the assertion that there are adolescent risk factors that are informative of adult offending outcomes. Alone, however,

these results should not be considered justification for, for example, more punitive sanctions against youth with high symptoms of psychopathy. The literature on sexual offending is a good example of how criminal justice policies can create rather than dismantle barriers to desistance (e.g., Laws & Ward, 2011). Attention should instead be given to the development of early, therapeutic treatment for children and adolescents presenting with symptoms associated with psychopathy.

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