THE IMPACT OF PRIOR CRIMINAL CHARGES ON SEX OFFENDER RECIDIVISM OUTCOMES: AN EXPLORATION OF POPULATION HETEROGENEITY AND STATE DEPENDENT MODELS

by

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ABSTRACT

Two competing theories explain the link between past and future criminal behavior: population heterogeneity and state dependence. Actuarial models of risk prediction for sexual offenders emphasize static variables, akin to population heterogeneity. State dependence, however, has never been tested with similar populations. This study examines both models. The sample consists of sex offenders admitted to a penitentiary in Quebec, Canada from 1994-2000. Analyses were conducted on offenders age 36 and over ($n=242$). Official criminal activity was measured at: (a) 18-23 years; (b) 24-29 years; (c) 30-35 years; and, (d) 36 + years. Survival analyses and Cox proportional hazards show supporting evidence for both state dependent and population heterogeneity models after adjusting for sociodemographic covariates. Violent/sexual recidivism after prison release was based on convictions. Findings are discussed in light of the current application of sex offender risk assessment and community management.

Keywords: Population heterogeneity; state dependence; sexual offenders; life-course criminology; actuarial risk assessment; violent/sexual recidivism; survival analysis; Cox regression; criminal career; community management strategies.

EXECUTIVE SUMMARY

Two competing explanations exist to explain the link between past and future criminal behavior over time: population heterogeneity and state dependence. A population heterogeneity perspective assumes that an individual's proneness towards criminal behaviors remains stable across time and place. Conversely, a state dependent perspective assumes that the life-events and experiences of an individual have the potential to either accelerate or decrease criminal activities. These two explanations are not incompatible and 'mixed models' of offending have been the subject of a great amount of theoretical work in the past twenty years. The need to better understand the offending process of individuals over time has become of increasing importance given the rise of the community protection model of justice in the early 1990s and the subsequent focus of the Canadian and American criminal justice systems on the identification and management of offenders. In light of this new approach to offender management actuarial models of risk prediction for violent and sexual offenders have been developed. Current actuarial risk assessment tools place a strong emphasis on static/historical variables in offender's lives (prior sexual, nonsexual-violent and nonsexual-nonviolent charges/convictions), which is in line with a population heterogeneity perspective of offending.

The aim of the current thesis is to examine both population heterogeneity and state dependent models in a sample of federally convicted adult male sex offenders. A state dependent model has never been tested with a similar population. The sample consists of sex offenders ($n= 242$) consecutively admitted to a federal penitentiary in Quebec, Canada from 1994-2000. Analyses were conducted on offenders age 36 and over

at the time of their release from incarceration (*n=242*), and with a sub-sample of offenders age 45 and over at their time of release (*n=145*). The official criminal activity of the sample was analyzed over four temporal periods: (a) 18-23 years, (b) 24-29 years, (c) 30-35 years, and (d) 36 years and over. Criminal history data was constructed from RCMP records and measured both prior violent/sexual and nonsexual-nonviolent charges over a 19-year retrospective period. This study is the first to examine the retrospective longitudinal patterns of offending at different time points in a sample of adult sex offenders. Kaplan-Meier survival analyses and Cox proportional hazards, using a hierarchical procedure, were used to assess the predictive accuracy of both prior violent/sexual and nonsexual-nonviolent charges on violent/sexual recidivism outcomes. Offender age at release, social assistance, civil status and educational achievement were all included as covariates in the models given that they have been identified by life-course criminologists as important criminogenic factors.

Both continuity and discontinuity of offending was found in this sample. Offenders who were active in one time period were also those who were active in subsequent time periods, while of the criminal history indicators receiving a charge in the most recent time period, without residuals (ages 30-35), was most predictive of violent/sexual recidivism. Of note is the observation that both prior violent/sexual and nonsexual-nonviolent charges occurring in the earliest observation period (ages 18-23) were not predictive of recidivism. Further, offender age at release, educational achievement and civil status were found to be better predictors of recidivism than prior criminal charges although differences in the predictive accuracy of these

sociodemographic covariates were found across the younger and older sub-sample of offenders.

The models tested and presented in this thesis show support for both population heterogeneity and state dependence, and thus it can be argued that this offending population is best characterized by both perspectives. The current risk prediction and risk management approaches that characterize the Canadian and American criminal justice systems are based heavily on the population heterogeneity perspective. This is exemplified by the reliance of corrections services on actuarial tools that focus on static risk factors; however, an approach utilizing both population heterogeneity and state dependence might best inform risk assessors. Given that current strategies for the management of sex offenders returning to the community (sex offender registries, community notifications, DOL, LTO, 810 orders) rely on actuarial tools to assign offender risk the possible over classification of offender risk has meaningful, and potentially, negative consequences for the reintegration process of sex offenders.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1: INTRODUCTION

One of the most robust findings in criminology to date is the relationship between past and future criminal behaviors (Bushway, Brame & Paternoster, 1999; Farrington, 2003; 1986; Hirschi & Gottfredson, 1983; Nagin & Paternoster 2000; 1991; Paternoster, Dean, Piquero, Mazzerolle & Brame, 1997). Two main perspectives, which are not necessarily contradictory to each other, have been used to explain this association - population heterogeneity and state dependent processes (Nagin & Paternoster, 2000). A population heterogeneity perspective assumes the presence, and the preponderant role, of a criminal propensity in explaining continuity between past and future offending behavior over time. A core aspect of the population heterogeneity perspective is the assumption that population heterogeneity is established relatively early on in life and remains stable over time, thus explaining the association between past and future participation in crime. The emergence of developmental life-course criminology has challenged the assumptions of stability in offender's risk of committing crime over time – akin to a state dependent perspective of offending. The state dependent approach is more concerned with the causal effect that prior participation in crime during one life period has on future participation in subsequent periods. The central assumption is that participation in criminal activities alone can shape one's environment, which subsequently functions to either increase or decrease the likelihood of reoffending. The state dependent approach, therefore, requires a longitudinal perspective on criminal participation - a necessity detailed by developmental and life-course criminologists (Elder, 1998; 1994; 1975; LeBlanc & Frechette, 1989; LeBlanc & Loeber, 1998; Loeber & LeBlanc, 1990; Laub & Sampson, 2003; Sampson & Laub 2005; 1997; 1993). To date, population heterogeneity

1

and state dependent processes have not been applied to the issue of risk assessment and risk prediction of adult sex offenders.

As a result of the new penology (Feeley & Simon, 1992) the risk management and risk assessment of offenders has become of primary concern to the Canadian and American criminal justice systems. Unlike any other offending group sexual offenders are subjected to some of the strictest mechanisms of control once released into the community (civil commitment laws, sex offender registries, community notifications, dangerous offender legislations, long-term supervision orders, 810 orders). The need to identify sex offenders at the highest risk of recidivating has led to the development of actuarial risk assessment tools. While atheoretical in nature, the five most utilized risk assessment tools focus on the static/historical factors of the offender placing great emphasis on prior criminal activity (Epperson, Kaul, Huot, Hesselton, Alexander, & Goldman, 1998; Hanson, 1997; Hanson & Thornton, 2000; Thornton, Mann, Webster, Blud, Travers, Friendship & Erikson, 2003; Quinsey, Harris, Rice & Cormier, 1998). These tools, therefore, build upon one of the most robust finding in criminology – i.e., the association between past and future behavior. More specifically, offenders with a lengthier criminal history are believed to be at a greater risk of reoffending and, as a result, are subject to longer sentences, sent to prisons with higher security conditions, and are the targets of stricter conditions of parole/release, etc. While these risk assessment tools builds on the association between past and future behaviors, they fail to account for the imperfect association between past and future behavior over time. More specifically, these actuarial assessments fail to take into consideration the dynamic aspects characteristic of all offenders lives (Laub & Sampson, 2003). Scholars have cautioned

that failing to account for the aging process of offenders may subsequently misclassify offender risk (Barbaree et al., 2003; Barbaree et al., 2007; Barbaree et al., 2009; Hanson, 2006; Lussier & Davies, 2010; Lussier & Healey, 2009; Lussier et al., 2010), which is of significant importance when considering the mechanisms of control sex offenders are subject to.

The current thesis focuses on the relationship between past and future offending, aging and the dynamic aspect of offending over the life-course. Actuarialists have emphasized the key role that past behavior has in predicting sexual recidivism and several actuarial tools have been designed based on this specific assumption; however, the dynamic aspect of offending, and the role of offender aging, are not taken into account when determining the risk of recidivism using such tools. More specifically, this thesis examines whether past offences carry the same predictive value over time. Is an offender always more likely to reoffend because of his prior criminal record, in spite of the passage of time and aging? Of central importance is how the relationship between past and future offending has been conceptualized in the context of risk assessment and risk prediction. In order to achieve this, we first review the theoretical perspectives on crime in the life-course, recent trends in criminal justice responses to the issue of sexual offenders, and sexual recidivism studies. In doing so, the current study reexamines a well-established "fact", i.e. that past behavior is the best predictor of future behavior. This re-examination however is done using a different perspective, a developmental life-course view on delinquency and crime.

CHAPTER 2: LITERATURE REVIEW

2.1 Theoretical Perspectives on Crime in the Life-course

Of primary interest to criminologists are the offending processes that occur over the life span of individuals. Offenders who participate in criminal activity over an extended period of time are often referred to as having a 'criminal career.' Proponents of the criminal career paradigm argue that the concept is best characterized as the pattern of offending committed by an individual over a longitudinal period of time where there is a distinguishable rate of offending (Blumstein, Cohen & Farrington, 1988; Delisi, 2005; Farrington, 2003; Nagin & Land, 1993; Piquero, Farrington & Blumstein, 2007; Rowe, Osgood & Nicewander, 1990). Blumstein et al. (1988) cite that the criminal career paradigm is not a theory of crime, but a method of assembling knowledge about certain key aspects of offending for observation and measurement. The necessity of identifying and theorizing offending trajectories has become an issue of contention among scholars and the rise of developmental life-course criminology has been attributed to the lack of theoretical foundation utilized to conceptualize offending over time in the 1980s (Farrington, 2003). While proponents of the criminal career paradigm advocate the importance of assessing within-individual change over time challenges to this practice have been raised. Opponents of assessing within-individual change over time (ie Gottfredson & Hirschi, 1990; 1983) argue that this approach is not necessary as individuals are characterized by time stable traits. Despite challenges to the criminal career paradigm an emerging theoretical perspective has developed to address offending processes that occur over time – i.e., developmental/life-course criminology.

While the paradigms of developmental and life-course criminology are complimentary to the extent that they are both concerned with explaining within-individual changes over time they diverge in their areas of concentration. Developmental criminology is concerned with risk factors, developmental stages and changing behavioral manifestations of criminal behavior over time (LeBlanc & Frechette, 1989; LeBlanc & Loeber, 1998; Loeber & LeBlanc, 1990). Developmental criminology focuses on within-individual changes over time, which is a departure from previous perspectives that focused on between group differences and relied solely on official records, the comparison of differences in offending rates among groups of offenders and cross-sectional measurements of criminal involvement (Loeber & LeBlanc, 1990). The focus on within-individual changes over time thus requires a longitudinal perspective considering that developmental criminology assumes that offending develops over time. As individuals grow older, they are exposed to an increasing number of different risk factors, especially during middle to late childhood (Thornberry, 2005). Hence, different causal factors operate at different points during human development. As a result, heterogeneity in causal mechanisms is likely to create various antisocial and offending patterns, or trajectories. An important aspect of this approach, therefore, is the recognition of heterogeneity in offenders and the importance of recognizing such heterogeneity for prevention and intervention purposes.

Life-course criminology concentrates on life events, life transitions and desistance from offending over time (Elder, 1998; 1994; 1975; Sampson & Laub 2005; 1997; 1993; Laub & Sampson, 2003). Elder (1994, 5) summarizes the life course perspective to represent the following, "overall the life course can be viewed as a multilevel

phenomenon, ranging from structural pathways through social institutions and organizations to the social trajectories of individuals in their developmental pathways." Although the process of aging has long been considered an important aspect of social structures, the implications of the process of aging has not been fully realized (Elder, 1975). Participation in social structures (e.g., education, work, family and involvement in social organizations) function as mechanisms of formal and informal social control and the salience of these institutions, as a means to meaningfully change behavior, is attributed to involvement in these institutions at the appropriate timing in the life-course - social change is the result of different life-course experiences (Elder, 1975; 1998). Life-course criminology, therefore, is interested in the role of different social institutions as individuals grow older, and the role of such institutions in limiting offending behaviors over time. While the life-course perspective does not suppose the presence of different causal mechanisms responsible for offending, it does suggest that the association between past and future offending is imperfect, as the social context of individuals can change over time, which ultimately effects their involvement in crime.

The developmental and life-course perspectives of offending are not contradictory, but complementary perspectives to the understanding of the association between past and future offending. Farrington (2003) speaks of the role and importance of a "developmental life-course" for the understanding of the causes of crime over time. Furthermore, Farrington (2003) presents that in addition to the primary goal of developmental life-course criminology, recording and explaining within-individual changes in individual's involvement in antisocial or criminal activity over time, three additional areas of inquiry have been incorporated into the developmental/life-course

criminology paradigm: (1) the development of antisocial behaviors and offending, (2) risk factors for offending at different ages and (3) the effects of life events in the course of development. While both paradigms seek to explain the relationship between past and future behaviors (of which criminologists have observed a significant albeit imperfect relationship - Bushway et al., 1999; Farrington, 2003; 1986; Hirschi & Gottfredson, 1983; Nagin & Paternoster 2000; 1991; Paternoster et al., 1997) the focus of life-course criminology centers upon how changing life circumstances influence future behaviors in light of past behaviors and as a result of the aging process.

2.2 Population Heterogeneity and State Dependence

The developmental life-course perspective is concerned with the role of population heterogeneity and state dependent processes on past and future offending participation. Central to these two processes is the seemingly conflicting observation that: (a) most adult criminals were juvenile offenders, and; (b) most juvenile offenders do not become adult criminals (see, Farrington, 2003; Moffitt, 1993). While the first observation suggests the presence of continuity in offending over time, the second stresses the presence of much discontinuity. The presence of both continuity and discontinuity has been the subject of a great amount of theoretical work; Nagin & Paternoster (2000; 1991) have reviewed the theoretical and empirical literature and have offered two hypotheses explaining such a phenomenon – population heterogeneity and state dependence.

Population Heterogeneity. Population heterogeneity assumes that the propensity or proneness of an individual to participate in antisocial and/or criminal behaviors over time is a stable trait (Nagin & Paternoster, 2000; 1991). Accordingly, from the beginning individuals within a given population differ in their inclination to commit crime

7

throughout the course of their lives. These time stable individual differences effect criminal participation but are not subsequently affected by the consequences of participation in crime or by changing life circumstances (job stability, marriage) (Bushway et al., 1999; Nagin & Paternoster, 2000). Furthermore, as a result of an individual's proneness, or propensity, towards antisocial or criminal behaviors the relationship between past and future criminal involvement should be positively correlated - i.e., meaning that prior criminal involvement should be indicative of future criminal involvement (Nagin and Paternoster, 1991). Nagin and Paternoster (2000) cite that between individual differences such as socialization, personality and biological/constitutional risk factors increase criminal propensity regardless of life circumstances. Continuity in offending over time is thus the result of time stable between-individual differences[1].

Nagin and Paternoster (2000) present several theories that utilize the paradigm of population heterogeneity to account for continuity in offending over time. However, the authors note that although each theory functions from a criminal propensity perspective, the theories depart in their explanations of the how initial distributions of criminal propensity in a population are established. Gottfredson and Hirschi (1990) attribute

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[1] In 1991 Nagin and Paternoster introduced an "urn scheme" to help illustrate population heterogeneity. They present that all individuals can be thought of as having an urn with two types of balls: (1) red balls which represent the commission of a criminal act, and (2) blue balls which represent participating in a prosocial event or behavior (Nagin & Paternoster, 2000; 1991). For the illustrative purposes of population heterogeneity the distribution of red and blue balls in an individual's urn differs from individual to individual; however, the distribution of red and blue balls within a given urn remain reasonably stagnant over time. Individuals select balls, with replacement, from their urn. Accordingly, as a result of the initial distribution of red and blue balls some individuals are more likely to select a red ball (commit a criminal act). Furthermore, Nagin and Paternoster (2000; 1991) present that it is rational to assume that people who have selected a red ball in the past (previous criminal acts) have a higher probability of selecting a red ball again in the future (commission of future criminal offenses). The scheme helps to illustrate that based on the initial individual distribution of red and blue balls some individuals are more or less likely to commit crimes – according to their initial criminal propensity.

differences in rates of offending to varying levels of self-control within a given population. They argue that self-control is established through effective socialization (by age 8), that individual differences may influence the extent to which self-control can be developed and that for the most part self-control becomes a stable and enduing trait throughout the life-course.

However, other scholars have attributed differences in population heterogeneity to neuropsychological deficits (Caspi, Lynman, Moffitt & Silva, 1994; Moffitt, Lynman & Silva, 1994; Caspi & Moffitt, 1995; Moffitt, 1993). Factors, such as constraint and negative emotionality are latent time stable traits that have been identified as being the origins of antisocial, delinquent and criminal acts throughout the life-course (Caspi et al. 1994). Wilson and Herrnstein (1985) accredit differences in criminal propensity to biological mechanisms. Both biological and constitutional factors can result in differences in autonomic nervous system functioning, which subsequently affects the ability to delay gratification (Wilson & Herrnstein, 1985). Finally, for Farrington (2005; 2003) population heterogeneity can be characterized by what he refers to as 'antisocial potential' whereby he differentiates between long-term persisting between-individual differences (resulting from impulsiveness, strain, modeling, socialization processes and life-events) and short-term within-individual variations (a result of motivational and situational factors).

State Dependence. Conversely, the second explanation of criminal involvement over time, state dependence, argues that events in an offender's life have the potential to either accelerate, or increase, the probability of future criminal involvement, but also to decrease the likelihood of future criminal involvement (Bushway et al, 1999; Nagin &

9

Paternoster, 2000; 1991). State dependence thus creates a process through which past behaviors have causal implications for future behavior such that they can decrease criminal inhibitions to commit crimes and/or heighten criminal motivation (Bushway et al., 1999). Nagin and Paternoster (2000; 1991) present that criminal and noncriminal behavior can be thought of in two ways: (1) participation in criminal behaviors may create future offending opportunities, while limiting prosocial (noncriminal) opportunities, and (2) participation in prosocial (stable employment, marital stability) activities may reduce opportunities for criminal behaviors. Hence, criminal participation has the potential to make life circumstances worse for offenders and increase future offending, while participation in prosocial institutions (i.e., work, marriage) and noncriminal behaviors have the potential to inhibit criminal behaviors in the short term and encourage desistence over the long term (Nagin and Paternoster, 2000)[2].

Nagin and Paternoster (2000) cite that state dependent paradigms have been utilized by criminologists both in the past, and more recently, to explain changes in offending patterns and how life circumstances or events influence offender outcomes. Such theories that have incorporated a state dependent perspective include: societal reactions to deviance, labeling theory, social learning theory, general strain theory, and the interactional theory of crime. In 1962 Kitsuse detailed the magnitude of societal reactions to deviant behavior. Kitsuse (1962) highlighted three key societal processes that

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[2] In the urn scheme illustrating state dependence Nagin and Paternoster (2000; 1991) describe a situation where individuals are assigned an equal proportion of red and blue balls into their urns. The equal distribution of balls functions to describe a population that is comparable in terms of their initial criminal propensities. However, unlike the case with population heterogeneity when a red ball (criminal offense) is selected from a state dependent urn it is replaced with one or more red balls. The same process occurs with the blue balls. Consequently, the fluctuating distribution of red and blue balls has the potential to influence either the probability of committing a future crime or engaging in a prosocial activity (Nagin & Paternoster, 2000;1991).

construct deviant behavior: (1) identification of deviant behavior, (2) identification of individuals who participate in such behavior as deviant, and (3) treating the individual as deviant. This constructive progression was further developed by Becker (1963) into labeling theory. Labeling theory argues that a person does not become criminal by solely committing an act that violates the law, but that they become a criminal as a result of being labeled as a criminal by the criminal justice system (Wellford, 1975). Societal reaction to mechanisms of formal social control often function as informal exclusionary measures that subsequently inhibit opportunities for participation in prosocial activities – i.e. participation in noncriminal activities can facilitate closing off criminal opportunities (Nagin and Paternoster, 2000).

Social learning theory is also complimentary to the state dependence process. Aker's (1975) presents that interactions among social actors in a given environment shape behaviors, i.e. deviant behavior, when the social network positively reinforces these behaviors. The extent to which deviant or criminal behavior can be shaped though this interactional process is also true of prosocial behaviors (Akers, 1975). In a similar manner Agnew's (1992) general strain theory highlights how negative circumstances in one's social environment can generate strain. As a coping mechanism individuals may seek to alleviate that strain by adapting their behavior. This adaptation can take the form of deviant or criminal behaviors and based on the outcome (either positive or negative), and reinforcement of these behaviors past actions, can meaningfully influence future behavior. In Thornberry's interactional theory of crime (1987) criminal behavior is the result of the combination of a person's weak attachment to socializing institutions, such

11

as school, the interaction that an individual has with delinquent peers and the opportunities they have to participate in and learn criminal behaviors.

2.3 Population Heterogeneity and State Dependent Mixed Models

While most theoretical models of offending are based on either population heterogeneity or state dependent processes, more recent theoretical formulations have incorporated both to explain offending over time. Hence, while population heterogeneity and state dependence perspectives differ in their explanations of the causal processes of crime Bushway et al. (1999), Nagin and Paternoster (2000, 1991) and Piquero et al. (2003) contend that population heterogeneity and state dependent models are not adversarial towards each other, but that in actuality mixed models of offending offer the best understanding of offending continuity and change over time. The assumption of these mixed models is that the relationship between past criminal behaviors and future criminal involvement can be a function of differences in initial criminal propensities which in turn can either be exacerbated or reduced by criminal involvement and life circumstances (Bushway et al., 1999; Nagin & Paternoster, 2000; 1991). In other words, stable-individual differences influence the likelihood of offending at different time-points over life-course, but this likelihood is further subject to the social context and the social environment in which the individuals are involved. One model that best exemplifies the combination of both population heterogeneity and state dependent processes has been presented by Sampson & Laub (1993).

In their conceptualization of offending trajectories throughout the life-course Sampson and Laub (2005; 1997; 1993) and Laub and Sampson (2003) argue for an age-graded theory of informal social control whereby social bonds embedded in social

institutions have meaningful influences on offender outcomes. Although Sampson and Laub concur with Gottfredson and Hirschi (1990) that individual's differ in their propensity to commit crime, and that this underlying propensity is stable over time, they argue informal social bonds forged in adulthood (i.e. marriage, finding satisfactory work, military service) have the ability to change criminal trajectories despite propensities developed in early life (Laub & Sampson, 2003; Sampson & Laub, 2005; 1997; 1993). Sampson and Laub (2005; 1997; 1993) and Laub and Sampson (2003) identify the importance of transitions and trajectories in the life-course to the extent that they influence state induced opportunities for crime. Early differences in delinquency manifest themselves in two ways in adult criminality. Firstly, individuals with an early propensity towards crime continually channel themselves into situations coherent with this trait as they transition into adulthood. As a result, Sampson and Laub present that correlations between adult conduct (i.e. unemployment and crime) are spurious and once prior individual level differences in criminal propensity are controlled for the relationships should no longer exist (Sampson and Laub, 1993). Secondly, they make reference to Nagin and Paternoster's (1991) proposed process of state dependence. In their interpretation Sampson and Laub (1993) focus on the role of delinquent or criminal acts and the consequences these acts have on the development, or sustainment, of social and institutional bonds an individual has within society. However, Sampson and Laub (1993) note that the two pathways they propose are not mutually exclusive as early delinquency and adult social bonds can have independent outcomes for adult criminality.

In 2003 Laub and Sampson revised their theory of informal social control to include human agency, situational contexts of crime and violence, and historical contexts

– all important constructs in Elder's (1998; 1994; 1975) view of the life-course. Laub and Sampson (2003) state that the context in which crime and violence emerges is important when evaluating the potential of social control. They suggest that the extent to which an individual's actions are routine, their time is structured and they engage in alcohol or drug consumption are all situational variables that can affect criminal participation.

Sampson and Laub (2005) criticize scholars who have divided individuals into groups of offenders. They argue that by categorizing offenders one cannot account for individual differences within a cohort. Laub and Sampson (2003) argue that criminal desistance and the 'aging out of crime' is a reality for all groups of offenders, citing that typologies of offender trajectory groups are inadequate when accessing the developmental causes of crime. Sampson and Laub (2005) describe turning points to be a repetitive dynamic process that occurs throughout the life-course and are continually socially produced over time. Of the socializing institutions identified by Sampson and Laub (1990; 1993; 2005) and Laub and Sampson (2003) they cite marriage and job stability as the most significant mechanisms of desistence.

Several empirical studies have examined the role of population heterogeneity and state dependent processes (Land, McCall & Nagin, 1996; Nagin & Farrington, 1992; Nagin & Land, 1993; Nagin & Paternoster, 1991; Paternoster & Brame, 1997; Paternoster, Brame and Farrington, 2001). After reviewing these studies Nagin & Paternoster (2000), as well as Piquero et al. (2003), came to the conclusion that there are mixed findings for both the population heterogeneity and state dependence models. In general Nagin and Paternoster (2000) note two key findings: (1) individual differences in criminal propensity are more significant than previously believed and (2) the life events

and experiences of an individual, that occur after a criminal propensity has been established, have meaningful consequences for future offending and eventual desistence.

Empirical studies that show greater support for population heterogeneity usually employ more high-risk samples of offenders and are based on official data (convictions or arrests), whereas, empirical studies showing support for state dependence usually employ samples with less serious offending histories such as college students (Blokland & Nieuwbeerta, 2005; Nagin and Paternoster, 2000; Paternoster et al., 1997; Piquero et al., 2003). Nagin and Paternoster (200) suggest five issues future research concerning population heterogeneity and state dependence must address: (1) the sources of differing criminal propensities, (2) the identification of specific life events and experiences that can lead to criminal desistence, (3) empirical results must be interpreted with caution and researchers must continually be sensitive to the assumptions of their statistical models, (4) theorists and researchers must work to understand the causal process of criminal desistence and (5) criminologists need to strictly evaluate the allocation of and offender's responses to chances to desist from crime. While these findings and conclusions are applicable to general samples of offenders, it remains unclear as to how these processes might operate with specific sample of offenders, such as adult sex offenders.

2.4 The Community Protection Model of Justice and Sexual Offenders

In recent years, the Canadian and American criminal justice response to the issue of sexual violence has been characterized by what scholars have referred to as the "community protection model" (Petrunik, 2002; 2003). The community protection model was first described by Feeley and Simon (1992) under the label of "the new penology." According to Feeley and Simon (1992), the community protection models offers three

15

ways in which the discourses of criminal justice systems and criminology where affected by this ideological shift: (1) in replace of clinical diagnoses and retributive judgment offender probability and risk became of central concern; (2) offender punishment and rehabilitation became less important than identification and management; and (3) individualization of offender management was replaced with managing aggregates of offender groups. The community protection model is thus characterized by offender restriction, surveillance, monitoring and control, disproportionate sentences, and as a consequence of risk assessment, public identification and increased probationary conditions (Kemshall, 2008; Lieb et al., 1998; Petrunik, 2003; 2002).

Sex offenders represent the group of offenders that have been the most widely affected by this ideological shift toward the community protection model of correctional practices. To this end, Simon (2000) and Quinn, Forsyth & Mullen-Quinn (2004) present that in comparison to other violent offenders, sex offenders have been identified as the most grievous, which has resulted in differing degrees of treatment by both the mental health and criminal justice systems. Along with their perceived dangerousness the differential treatment of sex offenders is attributed to the belief that sex offenders are specialists and therefore the most likely to commit future sex crimes (Simon, 2000; Lieb et al., 1998). Numerous legal policies have been implemented to manage and monitor sex offenders in the United States and Canada and include: sexual predator laws (civil commitment), sex offender registries, community notifications, dangerous offender legislation/long-term supervision orders and peace bonds. In line with the community protection model, these legal and penal measures all share a focus on risk rather than diagnosis, management rather than treatment and rehabilitation, as well as, the

classification of offenders according to aggregate groups of sex offenders based on their level of risk of sexual recidivism (i.e., low, medium, high). The legal and penal measures that have emerged and continue to be developed by the Canadian criminal justice system exemplify the community protection model and are briefly introduced here.

Sex Offender Registries. In December 2004 the National Sex Offender Registry became operational in Canada. The Sex Offender Information Registration Act created a centralized database of information about convicted sex offenders in Canada and is maintained by the RCMP (Public Safety Canada, 2007). The goal of this database is to provide police officers with current information about, and the ability to locate, sex offenders in a given geographic area when investigating a sex offense. Crown council can apply to the court to compel a sex offender to register for either one of three terms: (1) 10 years if convicted of a summary offense or an offenses with a 2-5 year maximum penalty, (2) 20 years for a conviction with a 10-14 year maximum sentence, or (3) for life when there is an accompanying life sentence or an offenders has a prior sexual conviction (Public Safety Canada, 2007). To date, offender registries have not been implemented for any other offender types. The assumption underlying the usage of sex offender registries is the perceived stability of risk that is characteristic of sexual offending – i.e., sex offenders remain at-risk of committing sex crimes for long periods of time. Proponents of the usage of sex offender registries believe that police knowledge of where a sex offender resides may act as a deterrent from reoffending, and also that maintaining updated information about sex offender's locations have the potential to facilitate police investigations of sex crimes by helping to identify known sex offenders in a geographic area where an investigation is being conducted. Such measures have also been

17

implemented in the USA (see, e.g., Tewksbury, 2005), but the impact of such measures on reducing recidivism or helping to solve new cases remains unknown.

Community Notification. Community notification has also been used to alert the general population about the presence of a sex offender in the community. This measure has been commonly and widely used in the USA; however, it remains a relatively extraordinary measure in Canada, used in rare instances with a sub-group of high-risk cases. While in the matter of a decade the Unites States saw sweeping policy reforms to legally allow for the notification of sex offenders returning to the community (Jacob Wetterling Crimes Against Children Act 1994, Megan's Law 1996, The Pam Lychner Sexual Offender Tracking and Identification Act 1996; Maddan, 2008) the Canadian federal government has yet to provide a directive detailing the methods and appropriate circumstances of community notifications. Petrunik (2003) offers three possible explanations for this: (1) the division of power between federal and provincial government with regards to health care and justice systems, (2) the potential violation of the Charter of Rights and Freedoms that would occur as the result of community notification or registries and (3) victims advocacy groups are not nearly as pervasive in Canada, while restorative justice practices are much more common.

In 1996 the province of Manitoba was the first to implement legislation allowing the police to notify community members of the release of a high-risk sex offender from incarceration (Petrunik, 2003). Under the direction of provincial Solicitor General's offices each province and territory has the autonomy to construct community notification guidelines. This practice has resulted in enormous discretionary powers from province to province and even municipality to municipality. Generally there are three ways in which

information about offenders returning to the community can be made public and the level of notification is based on the perceived risk the offender to recidivate. Information about low-risk offenders is made available to police and corrections officers in the area that the offender is released into. Information about medium risk offenders is made available to specific organizations and groups that are most likely to be victimized by the offender, as identified by past behaviors. Finally, information about high-risk offenders can be distributed to the community to which the offender is released and can include media releases, flyers, police officers going door-to-door and town hall meetings (Lieb et al., 1998; Zevitz & Farkas, 2000).

The role of community notification is related to self-protection, and the idea that informed parents and citizens can prevent a sex crime from occurring by being knowledgeable about the offending history of an individual and by taking appropriate measures to avoid situations that could create an opportunity to offend. Studies conducted in the USA have not shown promising results as to the ability for these measures to decrease the risk of sexual recidivism (see, Levenson, D'Amora & Hern, 2007; Zevitz, 2006). Few evaluations exist as to the effectiveness of community notifications but those that have been conducted report the collateral consequences of registries and notifications to negatively affect the reintegration process of offenders (as they effect the offender's ability to gain sustainable employment, find suitable housing, increase victimization of vandalism and hinder the development of prosocial relationships - offenders report feeling harassed and ostracized) and to have little impact on reducing sexual recidivism (Levenson & Cotter, 2005; Levenson, D'Amora & Hern, 2007; Levenson & Hern, 2007; Levenson, Zgoba & Tewksbury, 2007; Tewksbury, 2007, 2005; Tewksbury & Ehrhardt

Mustaine, 2006; Tewksbury & Lees, 2007; 2006; ; Zevitz, 2006; Zevitz, Crim & Farkas, 2000; Zevitz & Farkas, 2000; Zgoba).

Dangerous Offender Legislation. In conjunction with the implementation of policies specifically geared towards the management of sex offenders Canada has seen an influx of policies targeting dangerous offenders. In 1995, amendments to the initial Dangerous Offender legislation (DOL) from 1977 were enacted which allowed for greater flexibility in applying for an offender to be identified as a dangerous offender, as well as, creating a Long-Term Offender (LTO) provision whereby offenders identified as dangerous offenders can be subject to an additional 10 years of community supervision (Petrunik, 2003; 2002). The DOL and the LTO are two different mechanisms that are not used in conjunction. The DOL is an indeterminate prison sentence for offenders having been recognized by the court as a dangerous offender. In order to be considered a dangerous offender an individual must have been convicted of a serious personal injury offense where one or more of the following were present: extreme brutality, a failure to control sexual impulses, and the risk of causing injury, pain or other harms to a victim in the future (Petrunik 2002; 1994). The LTO refers to dispositions allowing the criminal justice system to supervise dangerous offenders whose risk has been deemed manageable when returning to the community. While DOL was aimed at violent sex offenders, LTO was aimed at sexual recidivists targeting, but not limited to, the offenses of sexual interference, sexual exploitation, incest, sexual assault and aggravated sexual assault (Martin's Online Criminal Code, Section 752). Public Safety Canada reports that as of February 2005 across Canada there were 113 LTO offenders in the community, and as of July 2006 18 DOL offenders had been paroled into the community (Public Safety

Canada, 2007). While the DOL is aimed at incapacitating the most dangerous offenders, the LTO is aimed at increasing formal mechanisms of control in the community to deter offenders from recidivating. In both cases, these mechanisms are based on the assumption that the risk of sexual recidivism is stable over long periods of time (Lussier, Dahabieh, Deslauriers & Thomson, 2010). The impact of such measures on the prevention of sex crimes remains unknown.

Peace Bonds (Section 810 of the Criminal Code of Canada). Finally, section 810.1 and 810.2 of the Criminal Code of Canada have been established to help increase the protection of the community against the risk of a sexual offence. Section 810.1 and section 810.2 orders (or peace bonds) are preventative orders applied to offenders identified to be a at-risk of offending through an application by the police or Crown council to the court. The order has the ability to restrict the behavior of an offender by prohibiting alcohol and drug consumption, implementing a curfew, and prohibiting contact with particular places or people (Lussier et al., 2010). In 1995, section 810 was revised to allow for easier application with sex offenders and 810 orders were divided into two parts: 810.1 is concerned with individuals deemed to be at risk of committing an offence against a victim 14 years and younger, while section 810.2 targets individuals identified to be at risk of committing a serious personal injury offense (Lussier et al., 2010). In British Columbia, sex offenders subject to an 810 order are typically federal inmates about to return to the community, who have mostly been designated as high-risk to sexually reoffend through risk assessment, and have been uncooperative in their treatment programs while incarcerated (Lussier et al., 2010). The impact of these measures on the risk of sexual recidivism remains unknown.

2.5 Outcomes of Mechanisms of Control - Risk Assessment with Sex Offenders

In light of the mechanisms of control that sex offenders are often subject to (i.e., civil commitment, sex offender registries, community notifications, 810 orders) the need of clinicians and the criminal justice system to accurately identify those offenders who are most at risk of committing future sexual offenses has become even more pressing. Across 61 studies, with an average follow-up period of 4-5 years, Hanson and Bussiere (1998) report an average sexual offense recidivism rate of 13.4% ($n = 23,939$; 18.9% for rapists and 12.7% for child molesters), and an average nonsexual violent recidivism rate of 12.2% ($n = 7,155$, 9.9% of child molesters n = 1, 774 and 22.1% of the rapists $n = 782$). Recidivism rates for general offenses (any reoffense) were much higher as approximately 36.3% ($n = 19, 374$) of their overall sample recidivated generally (36.9% of child molesters; $n = 3, 363$ and 42.6% of rapists. $n = 4, 017$). Hanson and Morton-Bourgon (2005) report a sexual recidivism rate of 13.7% across 73 studies ($n = 19, 267$), a violent nonsexual recidivism rate of 14.3% across 24 studies ($n=6, 928$), a violent recidivism rate, which included both violent and sexual recidivism, of 14.3% across 29 studies ($n = 11,361$) and a general recidivism rate of 36.2% across 56 studies ($n = 12, 708$). Accordingly, only a minority of adult sex offenders do reoffend, and when they do recidivate typically it is for a nonsexual-nonviolent crime. This reality further complicates matters for risk assessors whose objective is to identify those most at risk to sexually reoffend. In order to help clinicians identifying at risk offenders, several empirical studies have been conducted to identify risk factors that increase the likelihood of sexual recidivism.

2.6 Actuarial Prediction of Sexual Recidivism

Researchers and clinicians agree that no one factor that can be used singlehandedly to predict sexual recidivism and as a result evaluators have combined factors to assess the likelihood of sexual recidivism. Different methods have been used to evaluate risk factors and assessment of risk can be evaluated in one of three ways: guided clinical judgment, actuarial assessment and adjusted actuarial assessment. Guided clinical judgment refers to the process through which clinicians use empirically guided risk factors to base their opinion of an offender's recidivism risk on. Actuarial prediction refers to the use of empirically derived risk factors in the calculation of probability estimates of offender risk of recidivism – there is no consideration of factors outside of the risk scale used. Finally, adjusted actuarial assessment refers to a process by which clinicians will adjust an offender's actuarial risk score based on the presence or absence of relevant external factors (Hanson, 2003). In the Canadian Criminal justice system, most specifically in federal penitentiaries, actuarial prediction is the most widely used method to classify offenders according to their level of risk of sexual recidivism. Actuarial risk assessments are constructed from empirical findings; however, they are fundamentally atheoretical in nature (Beech, Fisher & Thornton, 2003; Roberts, Doren & Thornton, 2002). Actuarial instruments create structured guidelines for scoring and coding offender data that allows evaluators to combine this information and subsequently derive a numerical ranking of offender risk (Langton, Barbaree, Seto, Peacock, Harkins & Hansen, 2007). To date actuarial risk assessments are considered to be the most accurate tools for predicting sex offender recidivism (Beech et al., 2003; Hanson, 2003; Harris, Rice and Quinsey, 1998; Quinsey, Rice and Harris, 1995; Seto 2005).

2.7 Actuarial Prediction of Sexual Recidivism and Methodological Issues

Several reviews have highlighted methodological issues of empirical studies examining sex offender recidivism (Craig, 2008; Furby, Weinrott & Blackshaw, 1989; Greenberg, 1998; Hall, 1990; Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Proulx, Tardif, Lamoureux & Lussier, 2000; Quinsey, 1977).

Differences in sample selection and design, the length of follow-up periods utilized, the use of mixed offense type offender samples, the reliance on static factors, the use of official vs. self-report data and definitions of recidivism have all been identified as potential issues creating misleading findings in the actuarial prediction of sexual recidivism. Sample selection (i.e., the use of clinical vs. correctional samples, aggressors of adult women vs. child molesters; mixed samples of offenders) and design (retrospective, perspective, cross sectional) is a central concern as it determines the generalizability of findings (Furby et al., 1989; Greenberg, 1998; Hall, 1990). Differences in offender age, race, offense type and prior criminal convictions can affect recidivism outcomes. More importantly, studies based on forensic samples as opposed to those based on correctional samples may yield different findings due to the differences in the composition of the sample.

Definitional issues of recidivism are also of concern. Definitions of recidivism can include a new conviction for the same offense type, the commission of an offense type even if an offender is not officially charged, the commission of a new sex offense different than what the offender had previously been convicted for, and finally the

commission of any new offense (Furby et al., (1989). Despite flexibility in its definition recidivism is best defined as the commission of a new sexual or violent offense (Furby et al., 1989; Greenberg, 1998; Hall, 1990; Proulx et al., 2000). How best to measure recidivism is also an issue of contention as it can meaningfully affect recidivism base rates (Doren, 1998; Furby et al., 1988). While utilizing multiple sources of information offers the most accurate measure of recidivism, more so than relying solely on one source, it is rarely feasible (Hall, 1990; Furby et al., 1989). Potential sources of information on recidivism include official police records of arrest and convictions and offender's self-reports. However, the use of self-report variables should be limited as they are subject to response bias – the use of official records and additional sources of information have the potential to increase the reliability and validity of data (Greenberg, 1998; Hall, 1990; Hanson & Bussiere; 1998).

A follow-up period begins when an offender is released from custody, concludes at the time of data collection and to best measure offender time at risk any temporal periods at which the offender had no chance to reoffend (periods of incarceration, hospitalization) should be subtracted from the total length of the follow-up period (Proulx et al., 2000). Longer follow-up periods are more likely to best capture recidivism rates - a follow-up period of no less than 5 years is required in order to establish a base rate of offending and allow for statistical analyses (Proulx et al., 2000). However, Doren (2002) reports that inevitably half of the sexual recidivism recorded within a sample occurs after the first five years of a follow-up period. When comparing recidivism studies the length of the follow-up period must be the same length (Furby et al., 1989) as studies with longer follow-up periods often report higher rates of recidivism (Greenberg, 1998).

2.8 The Overreliance of Actuarial Risk Assessments on Static Predictors

Actuarial assessments are comprised almost exclusively of static variables (Beech et al., 2003; Epperson et al., 1998; Hanson, 2003; Hanson and Thornton, 2000; Quinsey et al., 1998; Zamble and Quinsey, 1997). Static variables are those characteristics of an offender's past history that are unchangeable: age, prior criminal history, demographic characteristics (i.e. gender), lack of long term intimate relationships (Beech et al., 2003; Hanson and Harris; 1998; Harris et al., 1998; Proulx et al., 1997; Zamble and Quinsey, 1997). Of all actuarial tools developed five have emerged as the most salient. The Rapid Risk Assessment of Sex Offenders, Hanson (1997); the Static-99, Hanson and Thornton (2000); the Risk Matrix 2000, Thornton et al. (2003), and the Sex Offense Risk Appraisal Guide (SORAG) designed by Quinsey et al., (1998). The four aforementioned instruments have been found to be better predictors of sexual recidivism than the final instrument the Minnesota Sex Offender Screening Tool-Revised (Beech et al., 2003; Langton et al., 2007) developed by Epperson et al. (1998) (See Table 1 for description of factors).

Table 1: Actuarial variables utilized in risk assessment tools (Bolded text refers to measures of offender age at release and criminal histories)

RRASOR (Hanson, 1997)	Static-99 (Hanson & Thornton, 2000)	Risk Matrix 2000 (Thornton et al., 2003)	SORAG (Quinsey et al., 1998)	MnSTOST-R (Epperson et al., 1998)
• **Prior sexual offenses** • **Offender age at release, or anticipated age at which the offender is at risk to recidivate in the community** • Male victims • Extrafamilial victims	• **Prior sexual offenses** • **Prior sentencing occasions** • **Convictions for noncontact sex offenses** • **Current or prior nonsexual violence** • **Prior nonsexual violence** • **Offender under the age of 25 at release or while in the community** • Male victims • Extrafamilial victims • Stranger victims • Lack of long-term intimate relationships	Stage one • **Age at commencement of risk** • **Sexual appearances** • **Total criminal appearances** Stage two • Male victims • Stranger victims • Non-contact sexual offenses • Lack of a long-term intimate relationship	• Living with both biological parents until the age of 16 • School maladjustment • Alcohol problems • Having not been in a long term intimate relationship • **Nonviolent criminality** • **Violent criminality** • **Previous sexual contact convictions** • **Convictions against girls under the age of 14 only** • Failure on prior conditional release • **Age at index offense** • Evidence of a personality disorder • Schizophrenia • Evidence of deviant sexual preferences • Psychopathy	• **Number of sexual convictions** • **Length of sexual offending history** • Offender being under supervision at the time a sex offense was committed • Sex offenses committed in a public place • Use or threat of force • Multiple acts on a single victim • Being in a different age group than the victim • Offended against a 13-15 year old and was a least 5 years older than the victim • Stranger victims • Antisocial behavior as an adolescent • Substance abuse • Employment history • Discipline history while incarcerated • Chemical dependency while incarcerated • Sex offender treatment while incarcerated • **Offender age at release**

The use of dynamic factors in predicting sexual, and violent, recidivism has been much more limited. Zamble and Quinsey (1997) argue that the overreliance of prediction instruments on static variables is detrimental as these tools fail to adequately provide practitioners with the information they need to assess changes in offenders over time – possibly as the result of treatment programs. While static variables only allow for the assessment of risk dynamic variables allow for both the assessment of risk and for subsequent changes to risk status (Hanson, 2003; Proulx et al., 1997; Zamble & Quinsey, 1997). Dynamic factors can include: stress, social support, coping skills, substance abuse, supervisory and intervention variables, affective states, cognitive distortions and deviant sexual interests (Beech et al., 2003; Hanson & Harris, 1998; Proulx et al. 1997; Zamble & Quinsey, 1997)[3].

2.9 The Effect of Age on Recidivism

The effect of the aging process on sexual recidivism has been an issue of contention. Numerous empirical studies have reported an inverse relationship between offender age and sexual recidivism (Barbaree et al. 2003; Barbaree et al., 2007; Barbaree et al., 2009; Craig, 2009; Fazel, Sjostedt, Langstrom & Grann, 2006; Hanson, 2006; 2002; Lussier & Healey, 2009; Prentky & Lee, 2007; Skelton & Vess, 2008; Thornton, 2006). In general, sex offenders are reported to be older than more general or violent

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[3] Dynamic variables can be further divided into two categories: stable dynamic factors and acute dynamic factors. Beech et al. (2003), Proulx et al. (2000) and Hanson and Harris (1998) describe stable dynamic factors as those such as personality disorders or deviant sexual preferences that have the potential to change over long periods of time – potentially as the result of offender treatment. Acute dynamic variables are those that change quickly (situational, negative emotional states, intoxication) and can act as a catalyst for an offense. Hanson and Harris (1998) note that acute dynamic variables are particularly useful for the community supervision of offenders and that in general for dynamic variables to be useful to practitioners they must be easily observed. The utility of dynamic variables to a great extent unknown although many call for their empirical validation (Hanson & Morton-Bourgon, 2005; Proulx et al., 2000; Greenberg, 1998; Hanson & Bussiere, 1998; Proulx et al., 1997; Quinsey et al., 1995; Quinsey, 1977).

offenders (Hanson, 2002), while sex offenders who are oldest at their time of release are reported to have the lowest recidivism rates (Doren, 2006).

While an inverse relationship between age and recidivism has been documented much debate still surrounds the best measure of age as a predictive variable. The aforementioned studies (Barbaree et al. 2003; Barbaree et al., 2007; Barbaree et al., 2009; Craig, 2009; Fazel et al., 2006; Hanson, 2006; 2002; Lussier & Healey, 2009; Prentky & Lee, 2007; Skelton & Vess, 2008; Thornton, 2006) reporting the inverse relationship between age and sexual recidivism operationalized age as offender age at release; however, the utility of offender age of onset and age at index offense have also been tested. Harris and Rice (2007) and Doren (2006) report that offender age of onset is a better predictor of recidivism over and above offender age at release.

The relevance of age in sexual recidivism becomes further important when considering the role it plays in actuarial assessment. The Static-99 (Hanson and Thornton, 2000), RRASOR (Hanson, 1997), Risk Matrix 2000 (Thornton et al., 2003), SORAG (Quinsey et al., 2006) and MnSOST-R (Epperson et al., 1999) all include measures of age in their assessment of risk.[4] Subsequently Barbaree et al. (2003), Barbaree et al. (2007), Barbaree et al. (2009), Hanson (2006), Lussier & Davies (2010), Lussier & Healey

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[4] As presented by Craig (2008) the Static-99, RRASOR, MnSOST-R all dichotomize offender age at release as putting offenders at a greater or lower risk of recidivism. For both the Static-99 and RRASOR offenders under the age of 25 are considered to be at a higher risk to recidivate, whereas, the MnSOST-R considers offenders 30 and under to have a greater risk of sexual recidivism. The Risk Matrix 2000 and SORAG utilize age bands in their assessment of risk. For the Risk Matrix offenders between the ages of 18-24 at the time of their release are considered to have the highest recidivism risk, offenders 25-34 are assumed to be at an intermediate level of recidivism risk and offenders assessed to have the lowest risk of sexual recidivism are those under the age of 18 or over 34 at their time of release. The SORAG identifies offenders 26 years of age and younger at the time of their release as being at the highest risk of recidivism, with decreasing risk as offenders turn 27 and subsequently fall with the age brackets of 28-33, 34-38. Offenders over the age of 39 are considered to be at the lowest recidivism risk.

(2009) and Lussier et al. (2010) caution that the failure of actuarial risk assessment tools to account for the aging process of offenders, in conjunction with their overreliance on static factors (mainly prior criminal convictions), have the potential to overestimate recidivism risk for older offenders and should subsequently adjust risk scores to account for this aging process. The adjustment of risk scores based on age is not however supported by Harris and Rice (2007) or Doren (2006).

2.10 The Relationship Between Prior and Future Criminal Involvement

Hanson and Bussiere (1998) state that one of the most practical ways of predicting recidivism is to establish a pattern of offending over time. The presence of prior criminal involvement (in particular prior sexual and violent convictions/charges) has been identified as a key factor in the prediction of future sexual offenses as operationalized in current risk assessment tools[5]. In 1987, Hall and Proctor conducted a recidivism study to explicitly test the predictive validity of prior felony arrests on future arrests in a sample of sexual offenders consisting of both rapists and child molesters ($n = 342$). Hall and Proctor (1987) present that the best predictor of future arrests for a sexual offense against an adult was previously having been arrested for a sexual offence, likewise for offenders who target children. Having been arrested for a prior violent nonsexual offense was also reported to be related to future arrests for sexual offenses against adults and nonsexual violent re-arrests (Hall & Proctor, 1987). These results

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[5] The Static-99 (Hanson and Thornton, 2000), the RRASOR (Hanson, 1997), the Risk Matrix 2000 (Thornton et al., 2003), the SORAG (Quinsey et al., 2006) and the MnSOST-R (Epperson et al., 1999) all include measures of prior criminal involvement in their assessment of risk.

support the crime specialization model whereby those with prior incidents of sexual aggression towards adults are most likely to reoffend against adults and those with prior incidents against children are most likely to recidivate against children. Hall and Proctor (1987) further note that the co-occurrence of sexual and violent criminal activity in adult aggressors could be attributed more generally to antisocial behaviors.

An offender's prior criminal history has also been included in numerous empirical studies (Firestone, Bradford, McCoy, 1998; Hall, 1988; Hanson, Scott & Steffy 1995; Proulx et al., 1997; Quinsey et al.,1995; Radzinowicz, 1957; Rice et al., 1991; Seto & Eke 2005; Simon, 2000; Soothill & Gibbons, 1978; Soothill, Jack & Gibbens, 1976; Thornton, 2006; Zamble & Quinsey, 1997). While numerous studies report prior criminal convictions as predictors of recidivism (Hall, 1988; Hall & Proctor, 1987; Hanson et al., 1995; Proulx et al., 1997; Quinsey et al., 1995; Radzinowicz, 1957; Rice et al., 1991; Seto & Eke, 2005; Soothill & Gibbons, 1978; Zamble & Quinsey, 1997) further differences have been reported between rapists and child molesters, recidivists and non-recidivists.

Proulx et al. (2000), Hanson et al. (1995), Hall (1988) and Hall and Proctor (1987) report offense type specialization whereby offenders previously arrested or convicted of a prior offense against a child are more likely to offend again in the future against a child – the same can be said of those who target adults. Hanson et al. (1995) further that this differentiation is also found between offenders who commit sexual offenses and those who commit nonsexual offenses. Frequently, offenders who subsequently committed a new sexual, violent or general offense are reported to have much more extensive criminal histories – this finding has been found to be true for both

31

rapists and child molesters (Firestone et al., 1998; Hanson et al. 1995; Proulx et al., 1997; Proulx et al., 2000; Quinsey et al., 1995; Rice et al., 1991; Seto & Eke, 2005; Zamble & Quinsey, 1997).

Despite reported findings of a relationship between past and future offending Soothill and Gibbens (1978) caution hazard in assuming that offenders with the most prior convictions are at the highest risk of recidivating. In their findings they report that offenders who at the beginning of their follow-up period had 2 prior convictions were the most likely to recidivate with a violent or sexual offense (47% recidivated) - even more so than offenders who had 3 or more prior convictions (22% recidivated). Thornton (2006) reports that with respect to the aging process for offenders with one prior sexual conviction the aging process was likened to a gradual linear decline in the odds of sexual recidivism; however, for those with no prior sexual convictions age at release and sexual recidivism were basically unrelated. Thornton (2006) furthers to report that offenders who had 2 or more previous sexual convictions had much high recidivism rates between the ages of 18-25, but once offenders aged out of this bracket their recidivism rates dropped significantly.

While the relationship between past and prior sexual convictions/arrests seems to be relatively well established both Soothill, Jack & Gibbens (1976) and Firestone et al. (1998) reported no relationship between prior convictions and recidivism outcomes in their evaluations. Significantly although Hanson and Bussiere (1998) anticipated that prior sexual offenses would be the best predictor of future sexual offenses they found that the majority of the sexual criminal history variables utilized in their meta-analysis

32

showed only a small to moderate correlations with sexual recidivism.[6] With respect to the predictors of nonsexual violent recidivism Hanson and Bussiere (1998) present that these recidivists tended to be more comparable to a general offending population in that for the most part they were young, unmarried, of a minority race and like the sexual recidivists they were more likely to have antisocial or psychopathic personality disorders.

Additionally, they note that offenders convicted of rape were more likely to recidivate with a nonsexual violent offense and that the number of prior sexual offenses was not related to nonsexual violent recidivism. Furthermore, Hanson and Bussiere (1998) note that general recidivism was predicted by the same variables as nonsexual violent recidivism (being young, unmarried, of a minority race); however, the best predictors of general recidivism were having antisocial or psychopathic personality disorders and prior criminal convictions in adulthood and as a youth. Unlike nonsexual violent recidivism prior sexual offenses were only slightly related to general recidivism.

2.11 Aims of the Study

Given the current reliance of actuarial risk assessment tools on static and historical factors, the aim of the current thesis is thus to explore the paradigms of population heterogeneity and state dependence as explanatory factors of the offending careers of sexual offenders, and the predictive impact that prior nonsexual-nonviolent and violent/sexual charges have on offender recidivism outcomes. Population heterogeneity assumes that that the propensity to commit crime is a time stable individual trait – as

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[6] Prior sex offenses, stranger victim, female child victim, early onset of sex offending, related child victim, male child victim, diverse sex crimes, exhibitionism, any adult male victims, any child victims, being a rapist, the age on any child victim, current length of sentence, degree of sexual contact, any force or injury to victims.

applied to this empirical study it functions on the basis that prior criminal charges are the best predictors of future recidivism outcomes.

Contrastingly, a state dependence approach considers how both contextual factors, as opposed to individual traits, and the negative consequences of previous criminal behaviors influence the probability of future offending. As such, prior sexual offenses are not indicative, or even the best, indicators of future sex offenses. The risk of committing future sexual offenses is not static to the extent that offender intervention, treatment and prevention programs, in conjunction with life-events, can meaningfully influence offender's risk of recidivism. Furthermore, in line with the life-course theoretical approach as detailed by Elder (1998; 1994; 1975) Sampson & Laub (2005; 1997; 1993) and Laub & Sampson, (2003) participation in prosocial institutions (meaningful employment, marriage) can act as catalysts to the criminal desistence process as Sampson and Laub (2005) and Laub and Sampson (2003) present that even the most violent and serious of offenders eventually desist their criminal activities.

Current criminal justice responses for the management of sex offender (sex offender predator laws, sex offender registries, community notifications, dangerous offender legislations, intensive supervision, 810 orders) operate from the perspective that prior criminal convictions or charges are the best predictors of future criminal involvement as they assume that the risk of sex offender recidivism remains high and static across time with the goal of identifying and containing offenders. These mechanisms of control, along with current actuarial risk assessment tools, do not account for the aging of offenders – a dynamic process unfolding over time. Although age is operationalized in risk assessment tools (being older or younger than a given point

34

increases or decreases assigned risk) they fail to account for changes in offender risk as a result of the aging process. As such, actuarial tools may subsequently overestimate or underestimate offender's risk of recidivism.

Accordingly several questions remain yet to be unanswered: (1) What is the impact of past criminal involvement on future criminal involvement? (2) What is the effect of aging on the link between nonsexual-nonviolent and violent/sexual prior charges and recidivism? (3) Is there an expiry date to the predictive value of a prior nonsexual-nonviolent or violent/sexual charge? (4) Is there an age-period where a nonsexual-nonviolent or violent/sexual charge increases the risk of recidivism? (5) Are more recent nonsexual-nonviolent or violent/sexual charges more predictive than more distant charges? (6) Is a simple count of the number of prior nonsexual-nonviolent or violent/sexual charges more adequate than taking into account the timing of prior charges?

To explore the paradigms of population heterogeneity and state dependence, as they apply to the criminal careers of sexual offenders, the focus of the study will be on the violent/sexual recidivism outcomes of a group of convicted sex offenders age 36 and over ($n = 242$), with a sub-sample of offenders age 45 and over ($n = 136$). In order to examine the impact of prior nonsexual-nonviolent and violent/sexual charges on violent/sexual recidivism a 19-year retrospective criminal history period has been constructed and further subdivided into four observation periods (ages 18-23, ages 24-29, ages 30-35 and ages 36+). The predictive impact of nonsexual-nonviolent and violent/sexual charges between the ages of 18-35, nonsexual-nonviolent and violent/sexual charges between the ages of 18-23, 24-29, 30-35 and 36+ and the

sociodemographic covariates of social assistance, educational attainment, civil status and

offender age at release will be assessed to explore their predictability of violent/sexual

recidivism.

CHAPTER 3: METHODOLOGY

3.1 Sample

Sampling. From April 1994 through to June 2000 all offenders convicted of, and incarcerated for, a sexual offense in the province of Quebec, Canada were asked to participate in a longitudinal research project evaluating recidivism. Of the 553 consecutive male offenders admitted during the six-year research period ninety-three percent of the offenders consented to participate in the project. This high rate of participation means that the sample represents a quasi-population of all sex offenders sentenced to a federal penitentiary in Quebec from 1994 to 2000. As this sample was composed of offenders having received a prison sentence of at least two years this group of sex offenders was comprised of individuals who had committed more serious sexual crimes and/or offenders with more extensive criminal backgrounds than those sentenced to a provincial prison or other community-based measures (e.g., probation, fine, etc.). Of the 553 offenders, detailed criminal history data necessary for this study was made available only for the first 393 cases recruited. Of the 393 participants, 15 (3.8%) cases were excluded due to incomplete criminal history data – i.e., missing nature of charges, missing date when the charges were laid. Of the remaining 378 subjects, only offenders age 36 and older were selected for analysis resulting in a total sample of 242 offenders. Selection of offenders at least 36 years old was necessary in order to create an observation period long enough whereby the impact of past criminal involvement could be compared to future criminal activity.

Description of Sample. The sociodemographic information of the offending sample is presented in Table 2. The sample was comprised of all male offenders ($n =$

37

242), who were predominantly Caucasian (92.1%, $n = 223$). At the time of committing their sex crime, the majority of this sample were receiving social assistance (51.7%) while 58.7% ($n = 142$, $x = .59$, $SD = .49$) were single. Almost two-thirds of the sample had not completed high school at the time of prison admittance. Taken together, this sample was relatively homogeneous in terms of their sociodemographic indicators, to the extent that they were predominantly poorly educated, Caucasian males who were single and receiving social assistance at the time of their offence.

However, this sample of sex offenders had committed their sex crime(s) against a wide variety of victim types, both in terms of age and gender. At the time of their admission to this study 16.1% of the offenders ($n = 39$) committed their crime against a prepubescent male (i.e., age 12 or younger), 13.2% ($n = 32$) against a pubescent male (i.e., between the ages of 13-17), while only 1.2% (n=3) targeted an adult male. Furthermore, 44.2% committed their crime against ($n = 107$) a prepubescent female, 26% against ($n = 63$) a pubescent female, and 24% against ($n = 63$) an adult female victim. Hence, while there was much heterogeneity in the victim type, a substantial proportion of this sample were heterosexual child molesters. The most prevalent convictions for which the offenders were last incarcerated included sexual assault (57.9%; $n = 140$), armed sexual assault (8.3%; $n = 20$), sexual interference (15.3%; $n = 37$) and invitation to sexual touching (17.8%; $n = 43$). Offenders were incarcerated for an average of 4.26 years ($SD = 3.1$, range =2-26).

3.2 Procedures

At the time of contact with the research team all participants were incarcerated at the Regional Reception Centre of Ste-Anne-des-Plaines – a maximum-security facility

operated by Correction Service Canada. Offenders are incarcerated at Ste-Anne-des-Plaines for the duration of their correctional assessment procedures, an average of six weeks, after which they are transferred to an institution that can best accommodate their level of risk and treatment needs. Participation in the study was completely voluntary. All participants included in the study signed a consent form allowing the information gathered to be used solely for research purposes. Participants also consented to allow researchers to access their correction files which included their criminal history data. Criminal history data was subsequently compiled by trained research assistants, graduate students in criminology or psychology, using a computerized questionnaire (QIDS; Proulx & St-Yves, 1994).

Table 2: Sample Description

Measures	Offenders age 36 and over (*n*=242)	Offenders age 45 and over (*n*=136)
Social Assistance	51.7%	41.2%
Civil Status	58.7%	60.3%
Education	64.5%	66.9%
Ethnicity		
Caucasian	92.1%	
African Canadian	3.3%	
First Nations	2.5%	
Other	1.2%	
Offender age at release	47.9 (9.5) years old, range: 36 - 77	54.3 (7.8) years old, range: 45 - 77
Criminal Career Parameters		
Age at First Crime		
Any Charges $_{a,d}$	33.9 (14.2) years, range: 15-74	38.8 (16.3) years, range: 10-74
Violent Charges$_{b,e}$	34.0 (10.8) years, range: 17-74	37.7 (12.8) years, range: 17-74
Sexual Charges$_{c,f}$	42.0 (11.5) years, range: 18-74	47.0 (12.0) years, range: 18-74
Frequency of Charges		
Any	15.3 (18.9) range: 1-133	14.0 (14.7) range: 2-80
Property	3.3 (8.1) range: 0-64	2.7 (6.9) range: 0-66
Violent	2.2 (3.7) range: 0-28	2.0 (3.8) range: 0-28
Sexual	4.6 (4.5) range: 0-28	5.0 (4.5) range: 0-27
Presence of Charges During Observation Periods		
Presence of NSNV Charges		
Age 18-35	51.7%	42.6%
Age 18-23	29.8%	24.3%
Age 24-29	32.6%	26.5%
Age 30-35	28.1%	22.8%
Age 36+	28.1%	37.5%
Presence of Violent/sexual Charges		
Age 18-35	38.4%	24.3%
Age 18-23	17.8%	14.0%
Age 24-29	16.9%	8.8%
Age 30-35	24.0%	13.2%
Age 36+	30.6%	43.4%

Note NSNV = Nonsexual-nonvoilent
a. n=107
b. n=134
c. n=238
d. n=53
e. n=64
f. n=134

3.3 Measures

Criminal History. The criminal history of each offender was compiled using RCMP official data. For the purpose of this study three types of crimes were considered: (1) sex crimes; (2) violent crimes and (3) nonsexual-nonviolent crimes. The crimes included here were categorized according to the definitions utilized in the Criminal Code of Canada (CCC). As such, sexual crimes include the following offences: sexual assault, armed sexual assault, sexual assault causing injuries, aggravated sexual assault, threatening sexual assault, inappropriate sexual contact, incest, anal intercourse, rape, indecent public acts (e.g., exhibitionism, voyeurism), acts of gross indecency, sexual interference, invitation to sexual touching, sexual intercourse with a female under the age of fourteen, sexual exploitation, sexual intercourse with a feeble minded person, indecent assault on a female, seduction of a female between the ages of sixteen and eighteen, sexual intercourse with a step-daughter, indecent assault of a male, buggery, sodomy. Violent crimes included: murder, attempted murder, assault with a weapon, assault, kidnapping, robbery, armed robbery, the use of a weapon, threats, intimidation, concealing the body of a child, excessive use of force by a person of authority, and high treason. Finally, the general offenses refer to all other nonsexual-nonviolent crimes (e.g., property crimes, crimes related to the administration of justice, alcohol-related offences, motor-vehicle-related offences, etc.) for which the offender was charged.

Description of Criminal Career. When considering the offenders' entire criminal careers of the 242 offenders 71.5% ($n = 173$) had experienced at least one prior sentencing occasion for any criminal offense. Furthermore, and in line with the nature of this sample of Federal inmates, on average the sample had 4 prior sentencing occasions

(SD = 4.9, range = 1-22). However, less than 35% of the sample (34.3%, n = 83, SD = .91, range =1-5) had previously been charged for a sex crime. On average offenders were 33 years of age at the time of their first crime (SD = 14.2, range = 15-74), 42 at the age of their first sexual crime (SD = 11.5, range = 18-73) and 34 at the time of their first violent crime (SD = 10.8, range = 17-74).

Criminal History and Time Periods. To examine the impact of both population heterogeneity and state dependent processes on recidivism, three time periods were created to measure the criminal history of this sample of sex offenders. The use of time periods was necessary in order to sufficiently capture the dynamic aspect of offending over time. Different offender age categorizations have been used in prior studies; however, without theoretical assumptions (Hanson, 1997; Epperson et al, 1999; Hanson and Thornton, 2000; Doren, 2006; Quinsey et al. 2006). The identification of young adulthood was emphasized (ages 18-23) as it has previously been associated with higher recidivism rates (Hanson & Thornton, 2000; Wollert, 2006). Further, two subsequent temporal periods of the same length were created (i.e., 6 years). Charges for sexual, violent and nonsexual-nonviolent crimes were coded for each of the following three periods: (1) between the ages of 18 and 23, (2) between the ages of 24 and 29 and (3) between the ages of 30 and 35. For each of the three categories of charges considered (i.e., sex, violent, nonsexual-nonviolent), the coding reflected the presence (coded as 1) or absence (coded as 0) of at least one charge during each of the three time periods. Considering the low base rate of both violent-only and sexual-only charges, the decision was made to combine them into a violent/sexual category. Descriptive data for each variable is presented in Table 2.

Of the offenders age 36 and over 38.4% ($n = 93$) had at least one violent/sexual conviction between the ages of 18-35. When examining the time periods an increasing trend in the prevalence of violent/sexual charges between the ages of 18 and 35 was identified; from 17.8% (ages 18-23) to 24.0% (ages 30-35). When considering charges for nonsexual-nonviolent offences, 51.7% ($n = 125$) of this sample had at least one charge between the ages of 18 and 35. The examination of charges by time periods showed that the prevalence of nonsexual-nonviolent offenses was relatively stable across time, moving between 28.1% (ages 30-35) and 32.6% (ages 24-29). Due to the fact that not all offenders were age 36 at the time of the study, some offenders were much older (i.e., 50s, 60s) and had accumulated charges between age 36 and their most recent incarceration, another variable was created to account for "residual" offending. Residual offending, therefore, refers to charges having been laid after age 36, and prior to the current incarceration period of which offenders were sampled for this study. Residual offending was coded for both violent/sexual crimes and nonsexual-nonviolent crimes. In total, 30.6% ($n = 74$) of the sample had at least one violent/sexual conviction age 36 and over while 28.1% ($n = 68$) of the sample had at least one nonsexual-nonviolent conviction age 36 and over.

Age at Release. The offender's age at prison release was used as a covariate in the current study considering its importance on the risk of reoffending (e.g., Lussier & Healey, 2009). The age of an offender at the time of their release from custody was calculated by subtracting the offender's date of release from their date of birth. On average offenders age 36 and over were 47.9 years old ($SD = 9.45$, range = 36-77) at their time of release.

Follow-up period. In June 2004 recidivism data was collected for all participants. The follow-up period refers to the time (i.e., number of months) offenders spent at risk of reoffending in the community. This measure was calculated from the participant's discharge date through to either: (1) the commission of a new offense or (2) to the end of the follow-up period in June 2004. Several factors can influence the duration of this period, most importantly: a) the date of admission; b) the length of the prison sentence; c) time spent incarcerated and d) the commission of a new offence prior to the end of the follow-up period (Lussier & Healey, 2009). On average the length of the follow-up period was 61 months or 5 years ($SD = 20.43$, range = 1-109). The length of the follow-up period is consistent with that used in previous studies (Barbaree et al. 2003, 2009; Hanson, 2006 Harris & Rice, 2007; Lussier & Healey, 2009).

Recidivism. Offender recidivism was measured as a new violent or sexual conviction during the follow-up period - coded as no new convictions (0), new convictions (1). Consistent with previous studies, violent and sexual convictions were combined due to: (1) the low base rate of these offenses; (2) the criminal versatility of sex offenders and (3) to account for the possibility of plea-bargaining processes (Hall, 1988; Lussier, 2005; Lussier & Davies, 2010; Lussier & Healey, 2009; Quinsey et al. 1998). At the time of data collection 12% (n=29) of the offenders age 36 and over had a new violent/sexual conviction. In comparison, there were only 13 (5.4%) sexual recidivists during that time period - a value too small for the use of multivariate survival analyses, thus reinforcing the decision to analyze violent/sexual recidivism.

3.4 Analytic Strategy

Several statistical techniques have been used to link criminal history indicators and recidivism. Statistical techniques that have been used in the past include methods such as multiple and logistic regression (Hall, 1988; Hall & Proctor, 1987; Rice et al., 1990; Thornton, 2006). Only one statistical technique accounts for differential time-at-risk across offenders, this being, survival analyses. Survival analyses refers to a family of techniques developed where the dependent variable is time-dependent (Allison, 1984; Cox, 1972; Norusis, 2010, Tabachnick & Fidell, 2007). Two types of survival analyses were used in the current study; (a) Kaplan-Meier, and (b) Cox proportional hazards. Both techniques have been used in the prediction of sexual recidivism in prior studies (Barbaree et al., 2009; Barbaree et al., 2003 Hanson, 2006; Hanson et al., 1995; Lussier & Healey, 2009; Quinsey et al., 1995; Soothill & Gibbens, 1978).

Kaplan-Meier Analysis. Kaplan-Meier analysis computes the length of time between two events (in this instance offender release to recidivism or the end of the follow-up period) without controlling for additional covariates (Norusis, 2010). This technique is typically used to compare the length of survival times between groups when survival time is the only consideration (Norusis, 2010). For the current study, Kaplan Meier survival analysis was utilized to evaluate the impact that prior criminal charges had on the mean survival times of the sample once released into the community. The Kaplan-Meier estimator is used to determine survival time when controlling for censored data. Censored data refers to cases for which the event of interest (in this study recidivism) has not occurred by the end of the period of observation (Allison, 1984; Cox, 1972; Tabachnick & Fidell, 2007). Kaplan-Meier analyses were run to assess the impact of both

prior nonsexual-nonviolent and violent/sexual crimes on the time spent in the community without reoffending. Kaplan-Meier analyses were run using PSAW 18.0.

Cox Proportional Hazards. Cox proportional hazards (Cox regression) models were used to test for the differential association between each of the criminal history indicators and recidivism, while adjusting for possible confounding factors (i.e., sociodemographic indicators). Cox regression is the most appropriate statistical technique for evaluating offender recidivism as it allows for the inclusion of censored cases (those offenders who did not recidivate during the follow-up period) – something for which logistic regression does not accommodate for (Allison, 1984; Cox, 1972; Tabachnick & Fidell, 2007). With the inclusion of covariates Cox regression allows for a more comprehensive understanding of the processes that contribute to the occurrence of an event – in the context of this study how prior criminal involvement and sociodemographic factors either increase or decrease the likelihood of violent/sexual recidivism (Box-Steffensmeier & Stanfill, 2008). Unlike other forms of regression multivariate normality, linearity and homoscedasticity among covariates is not required although Tabachnick and Fidell (2007) note that normalized distributions can enhance the power of analysis to form linear equation predictors.

Modelling for Cox-Regression Analyses. To test for the presence of population heterogeneity and state dependent processes, a sequential or hierarchical method of analysis was utilized. Hierarchical modelling is used whenever the researcher controls for the sequence in which the covariates are entered into the regression model, either individually or in blocks (Cohen & Cohen, 1983; Tabachnick & Fidell, 2007). This method of entry allows the researcher to evaluate the impact that each covariate has on

the model at its point of entry. Cohen and Cohen (1983) note that hierarchical analyses are one of the most useful tools when looking to pull out information from a data set. However, they caution researchers that the order in which the covariates are entered into the model should be driven by theoretical assumptions leading to causal priority, the structural properties of the factors being evaluated, and as a way of controlling for confounding or spurious relationships. This process is important as factors entered first into the regression model are attributed priority of the shared variance. Hence, a logical and temporal sequence was used to create the hierarchical modelling tested here to determine the association between prior charges and recidivism. This sequence was determined by the offender's age at the time the charges were laid, with the earliest period entered first (age 18-23), and the most recent entered last (age 36 and over). As such, six blocks of predictors were entered in the Cox-regression models in the following order; (a) the sociodemographic covariates of social assistance, civil status and educational achievement; (b) offender age at release; (c) charges 18-23; (d) charges 24-29; (e) charges 30-35 and (f) charges 36 and over. Separate models were run using first, nonsexual-nonviolent offences and, second, violent/sexual offences as covariates.

Population Heterogeneity and State-Dependent Processes. Hierarchical modelling using Cox-regression was used to test for population heterogeneity and state-dependent processes. A population heterogeneity perspective states that the causes of offending are the same across time and place (Bushway et al., 1999; Nagin & Paternoster, 2000). Hence, in the context of the current study, controlling for criminal activity between the ages of 18 and 23 should account for most of the tendency to offend. Furthermore, information provided by offending in subsequent time periods (i.e., ages 24-29; 30-35; 36

47

and over) should be redundant and irrelevant to the prediction of recidivism once offending in early adulthood has been accounted for in the prediction model. This modelling is also in line with the early-onset hypothesis (Bushway et al., 1999; Nagin & Paternoster, 2000).

Additionally, the state dependent model accounts for the dynamic aspect characteristic of all offenders lives and the extent to which life-circumstances and life-events have the potential to meaningfully influence offending behaviors (Bushway et al, 1999; Laub & Sampson, 2003; Nagin & Paternoster, 2000, 1991). Accordingly, offenses occurring earlier in life (between ages18-23) are not indicative of future offending or even the best predictors of future offending. Offenses occurring later on in life (between ages 24-35, age 36 and over), coupled with sociodemographic factors, have the potential to meaningfully influence recidivism. As such, as a result of changing life-circumstances offenses occurring at different periods in the life-course may have a greater impact on future criminal involvement.

For comparative purposes, a further subsample of offenders age 45 and older at the time of their release was also identified ($n = 136$). All analyses were also run using this subsample. The purpose of using this subsample was to further examine the aging process of offenders and the extent to which prior criminal involvement, in the even more distant past, remained predictive of violent/sexual recidivism. The average length of the follow-up period for the sample of older offenders was very similar (X=63, SD = 20.25, range 3 − 109) to that of the younger offending group, while even fewer, 8.1% ($n = 12$), of the offenders age 45 or older had a new violent/sexual conviction during the follow-up period.

CHAPTER 4: RESULTS

4.1 Bivariate Associations Between Covariates

Sociodemographics and Prior Offending. Pearson's correlation coefficients were computed among all the covariates tested. The results of the correlation analysis for offenders age 36 and over ($n = 242$) are presented in Table 3. Of interest here are the associations between sociodemographic and criminal history indicators, which may indicate whether offending varies across individual-level characteristics. In general, social assistance was significantly and positively related to having nonsexual-nonviolent charges between the ages of 18-23, ($r = .25$; $p < .01$), 24-29 ($r = .23$; $p < .01$), 30-35 ($r = .16$; $p < .05$) and 18-35 ($r = .31$; p < .01). Social assistance was also significantly and positively related to having prior violent/sexual crimes between the ages of 18-23 ($r = .19$; $p < .01$), 24-29 ($r = .22$; $p < .01$), 30-35 ($r = .21$; $p < .01$), and 18-35 ($r = .36$; $p < .01$). Offender's age at release was significantly and inversely related to having prior nonsexual-nonviolent crimes between the ages of 18-23 ($r = -.23$; $p < .01$), 24-29 ($r = -.21$; $p < .01$), 30-35 ($r = -.13$; $p < .05$) and 18-35($r = -.40$). The association between age at release and prior violent/sexual crimes was more pronounced for the ages of 18-23 ($r = -.24$; $p < .01$), 24-29 ($r = -.29$; $p < .01$), 30-35 ($r = -.28$; $p < .01$) and 18-35 ($r = -.28$; $p < .01$). Hence, the most criminally active offenders between the ages of 18 and 35 were younger at the time of their most recent prison release and most likely to have been on social assistance in the past. There was no evidence suggesting that these sociodemographic indicators were differentially associated to offending at different time points in the offender's past. Furthermore, prior criminal activity, therefore, was unrelated to education or ethnicity.

Table 3: Correlation Matrix of Covariates, Offenders age 36 and over (*n*=242)

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Social Assistance	-													
2. Civil Status	-.04	-												
3. Education	.15*	-.12	-											
4. Offender age at release	-.32**	-.00	.08	-										
5. Length of follow-up	.02	-.06	.07	.08	-									
6. NSNV charges (18-23)	.25**	-.06	.11	-.23**	-.07	-								
7. NSNV charges (24-29)	.23**	-.02	.11	-.21**	-.05	.41**	-							
8. NSNV charges (30-35)	.16*	.00	.10	-.13*	-.05	.24**	.35**	-						
9. NSNV charges (36+)	.12	-.05	.08	.15*	.06	.10	.17**	.14*	-					
10. Violent/sexual charges (18-23)	.19**	-.07	.12	-.24**	-.08	.53**	.23**	.09	.05	-				
11. Violent/sexual charges (24-29)	.22**	-.02	.08	-.29**	-.21**	.36**	.48**	.26**	.01	.34**	-			
12. Violent/sexual charges (30-35)	.21**	-.00	.03	-.28**	-.13*	.19**	.29**	.47**	-.03	.22**	.31**	-		
13. Violent/sexual charges (36+)	.07	.08	.10	.25**	-.05	.02	.17**	.16*	.42**	-.00	-.04	.03	-	
14. Nonsexual-nonviolent charges (18-35)	.31**	-.01	.09	-.40**	-.17	.42**	.36**	.34**	.02	.59**	.57**	.71**	-.03	
15. Violent sexual charges (18-35)	.36**	-.06	.18**	-.28**	-.09	.63**	.67**	.61**	.16	.36**	.37**	.33**	.14*	-

Note. NSNV = Nonsexual, nonviolent.
*p < . 05, ** p < .01

Prior Offending at Different Time Points. Next, all associations between the criminal history indicators were examined to determine the relative stability of offending over time. First, all correlations between nonsexual-nonviolent offending indicators were found to be statistically and positively significant, with correlations varying between .24 and .41. Second, a similar observation was found for violent/sexual offending, where correlations varied between .22 and .34. Third, at all time-points, it was found that nonsexual-nonviolent and violent/sexual offending was positively and significantly correlated. Fourth, correlations between adjacent time periods were stronger than those between crime indicators of distant, non-adjacent time periods. Taken together, this pattern of findings suggested that: (a) offenders who were active at one time point were also active at a subsequent time-point, irrespective of the type of offending; (b) associations were modest to low, suggesting that despite some continuity, there was also some discontinuity in offending over time; (c) offenders involved in prior violent or sexual crimes, were also involved in nonsexual-nonviolent crimes and (d) the association between past offending diminishes as the period of observation is extended.

Correlations for the Older Sub-sample (Age 45 and over). The same matrix of correlations was analyzed for the subsample of offender's age 45 old and older (see Appendix 1). For the most part, the same pattern of correlations observed for the age 36 and over offender group were also found for this subsample. Again, only social assistance and the offender's age at release were associated with offending behaviors, but the correlations found were somewhat more modest, which may be attributable to the smaller sample size. Similarly, the same pattern (direction, strength) of associations were found between indicators of criminal behaviors. An interesting departure was the association

51

between the length of the follow-up period and criminal history indicators. While a shorter survival period was associated with violent/sexual charges both between the ages of 24-29 and 30-35 for the full sample, the association was no longer present when looking at the older subgroup (45 and over).

4.2 Bivariate Associations Between Covariates and Recidivism

Sociodemographic Characteristics of Recidivists. Chi-square analyses with odds ratios were computed to determine the characteristics of offenders who were reconvicted of a violent/sexual crime during the follow-up period (see Table 4). Of the offenders, receiving social assistance age 36 and over 17.6% recidivated compared to only 6% of offenders not receiving social assistance. Those who were receiving social assistance were almost three and a half times more likely (OR = 3.36, 95% CI = 1.38-8.19; $p < .01$) to have recidivated. Of the offenders who had not completed high school 14.7% of these offenders committed a new violent/sexual offense during the follow-up period – these offenders were over two times more likely (OR = 2.31, 95% CI = .90-5.90; $p < .10$) to have recidivated than those who had completed high school.

Sociodemographics, Recidivism in Older Sub-sample. Similar to offenders age 36 and over, those offenders age 45 and over who did not complete high school were more likely to recidivate (OR = 5.43, 95% CI = .67-43.84; $p < .10$), but this association was only marginally significant; however, unlike offenders age 36 and over, offenders age 45 and over who were single were almost seven and a half times more likely (OR = 7.36, 95% CI = .91-59.28; $p < .05$) to commit a new violent/sexual crime during the follow-up period (Appendix 2).

Criminal History of Recidivists. In general, prior nonsexual-nonviolent and violent/sexual charges were associated with an increased likelihood of violent/sexual recidivism. Having prior nonsexual-nonviolent charges between the ages of 24-29 (OR = 2.50, 95% CI = 1.14-5.47, $p < .05$), 30-35 (OR = 2.33, 95% CI = 1.06-5.16, $p < .05$) and 18-35 (OR = 2.29, 95% CI = .1.0-5.25; $p < .05$) was associated with an increased risk of violent/sexual recidivism (see Table 4). However, of note is the fact that, prior nonsexual-nonviolent charges between the ages of 18-23 were not associated with an increased risk of violent sexual recidivism (OR = 1.80, 95% CI = .09-.14) With respect to prior violent/sexual charges, the presence of a charge between the ages of 18-23 (OR = 2.37, 95% CI = 1.00-5.64; $p < .05$), 24-29 (OR = 3.09, 95% CI = 1.31-7.27; $p < .01$), 30-35 (OR = 3.59, 95% CI = 1.61-7.98; $p < .01$) and 18-35 (OR = 3.57, 95% CI = 1.58-8.07; $p < .01$) all significantly increased the likelihood of violent/sexual recidivism.

Table 4: Proportion of violent/sexual recidivism of offenders age 36 and over (*n*=242)

	% (Violent/Sexual recidivism)	X^2	Phi	OR (95% CI)
Social assistance (1, Receiving)	17.6%	7.73**	.18	3.36 (1.38-8.19)
Social assistance (0, Not receiving)	6.0%	-	-	-
Civil status (1, No partner present)	12.7%	0.16	.03	1.17 (.53-2.61)
Civil status (0, Partner present)	11.0%	-	-	-
Education (1, Not completed high school)	14.7%	3.17[+]	.11	2.31 (.90-5.90)
Education (0, completed high school)	7.0%	-	-	-
Nonviolent-nonsexual charges 18-35	16.0%	3.96*	.13	2.29 (1.0-5.25)
No charges 18-35	7.7%	-	-	-
Presence of violent/sexual charges 18-35	20.4%	10.22**	.21	3.57 (1.58-8.07)
No charges 18-35	6.7%	-	-	-
Nonsexual-nonviolent charges				
Nonsexual-nonviolent charges18-23	16.7%	2.13	.10	1.80 (.09-.14)
No charges 18-23	10.0%	-	-	-
Nonsexual-nonviolent charges 24-29	19.0%	5.46*	.15	2.50 (1.14-5.47)
No charges 24-29	8.6%	-	-	-
Nonsexual-nonviolent charges 30-35	19.1%	4.56*	.14	2.33 (1.06-5.16)
No charges 30-35	9.2%	-	-	-
Nonsexual-nonviolent charges 36+	16.2%	1.58	.08	1.67 (.75-3.76)
No charges 36+	10.3%	-	-	-
Violent/Sexual charges				
Violent/sexual charges 18-23	20.9%	3.97*	.13	2.37 (1.00-5.64)
No charges 18-23	10.1	-	-	-
Violent/sexual charges24-29	24.4%	7.20**	.17	3.09 (1.31-7.27)
No charges24-29	9.5%	-	-	-
Violent/sexual charges 30-35	24.1%	10.68**	.21	3.59 (1.61-7.98)
No charges 30-35	8.2%	-	-	-
Violent/sexual charges 36+	10.8%	0.14	-.02	.85 (.36-2.01)
No charges 36+	12.5%	-	-	-

[+] *p* < .10, **p* < .05, ** *p* < .01

a. Only 7.9% of the entire sample was non-Caucasian resulting in too low cell counts to conduct chi-square analysis.

Criminal History, Recidivism in Older Sub-Sample. Comparatively, for offenders age 45 and over, only three criminal history indicators were significantly associated with an increased risk of recidivism: (a) the presence of a violent/sexual charge between the ages of 24-29 (OR = 4.83, 95% CI = 1.10-21.45; p < .05), (b) the presence of a violent/sexual charge between the ages of 18-35 (OR = 2.89, 95% CI = .82-10.17; p < .10) and (c) the presence of a nonsexual-nonviolent charge at age 36 and over (OR = 3.22, 95% CI = .89-11.61, p < .10) (Appendix 3).

4.3 Kaplan-Meier Analyses of Length of Survival in the Community

Sociodemographics and Survival Time in the Community. Kaplan-Meier analyses were conducted to determine the sociodemographic characteristics associated with a shorter or longer time in the community without reoffending. With respect to age at release, on average, those offenders age 36 and over who committed a new violent/sexual crime during the follow-up period were approximately 5 years younger than those who did not (43.3 years old, SD=6.8 compared to 48.6, SD=9.6) [$t(44.8)$=3.7, p<.01, d= .55]. There were no significant differences in terms of the length of the follow up period for offenders who committed a subsequent violent/sexual offence and those who did not.

Socio-demographics and Survival Time for the Older Sub-Sample. Similarly, for offenders age 45 and over who committed a new violent/sexual crime during the follow-up period they were, on average, approximately 4 years younger than those who did not recidivate (50.5 years old, SD=5.1 compared to 54.7, SD=7.9) [$t(134)$=1.7, p<.10, d=.62.]. Again, there were no significant differences in terms of the length of the follow up period for those who committed a subsequent violent/sexual offence and those who did not.

Criminal History and Length of Survival. Kaplan-Meier analyses were also used to analyze each of the criminal history indicators and length of survival in the community without a reconviction for a violent/sexual crime (see Table 5). Having prior nonsexual-nonviolent charges between the ages of 18-23 (OR = 2.78, 95% CI = 79.43-90.35; $p <$ .10), 24-29 (OR = 2.52, 95% CI = 77.72-87.59; $p < .01$), 30-35 (OR = 2.72, 95% CI = 77.00-87.66; $p < .01$) and 18-35 (OR = 2.00, 95% CI = 80.93-88.77; $p < .05$) were all significantly related to having shorter survival periods in the community. However, it is important to note the similarity of the odds ratios reported across each age bracket – the effect sizes are stable. Further, having prior violent/sexual charges between the ages of 18-23 (OR = 3.75, 95% CI = 75.87-90.58; $p < .05$), 24-29 (OR = 78.68 95% CI = 69.86-87.51; $p < .01$), 30-35 (OR = 2.54, 95% CI = 73.82-83.78; $p < .001$) and 18-35 (OR = 2.38, 95% CI = 77.27-86.50; $p < .01$) were all significantly related to having shorter survival times in the community. Again there is much uniformity in the odds ratios presented meaning that the effect size of each of the criminal history indicators is relatively similar across all age brackets. However, neither nonsexual-nonviolent charges age 36 and over (OR = 2.30, 95% CI = 81.33-90.33) or violent/sexual charges age 36 and over (OR = 2.55, 95% CI = 82.19-99.71) effected the length of the offenders survival time in the community.

Criminal History, Length of Survival for the Older Sub-Sample. Comparatively for offenders age 45 and older having prior nonsexual-nonviolent and violent-sexual charges were not as related to the length of survival in the community (Appendix 3). Only having violent/sexual charges between the ages of 24-29 (OR = 6.44, 95% CI = 65.50-90.75; $p < .01$), 30-35 (OR = 3.58, 95% CI = 72.44-86.47 ; $p < .05$) and 18-35 (OR

= 3.81, 95% CI = 78.19-93.11; $p < .05$) were significant predictors of shorter survival times in the community. However, it should be noted that both nonsexual-nonviolent (OR = 3.87, 95% CI = 85.25-100.52; $p < .10$) and violent/sexual (OR = 2.90, 95% CI = 81.09-92.47; $p < .10$) charges age 36 and over were marginal predictors of shorter follow-up periods. Of interest is the fact that both nonsexual-nonviolent and violent/sexual charges in the offenders more distant past (i.e. those occurring in early adulthood, ages 18-23) were no longer significant predictors survival time.

Table 5: Kaplan Meier models of survival times (in months) for violent/sexual reoffending for offenders age 36 and over (*n*=242)

	Mean Survival Time (SE) (95% CI)	Log Rank Mantel Cox X^2 (*df*), *p*-value
Nonsexual-nonviolent charges 18-35	84.85 (2.00) (80.93-88.77)	5.33 (1)*
No charges 18-35	100.65 (2.58) (95.60-105.70)	-
Violent/sexual charges 18-35	81.93 (2.38) (77.27-86.50)	13.70 (1)**
No charges 18-35	102.23 (2.06) (98.20-106.26)	-
Nonsexual-nonviolent charges 18-23	84.89 (2.78) (79.43-90.35)	2.77 (1) +
No charges 18-23	97.92 (2.39) (93.25-102.60)	-
Nonsexual-nonviolent charges 24-29	82.66 (2.52) (77.72-87.59)	7.38 (1) **
No charges 24-29	94.96 (4.11) (86.91-103.01)	-
Nonsexual-nonviolent charges 30-35	82.33 (2.72) (77.00-87.66)	6.66 (1)**
No charges 30-35	96.10 (3.59) (89.06-103.14)	-
Nonsexual-nonviolent charges 36+	85.83 (2.30) (81.33-90.33)	1.48 (1)
No charges 36+	92.94 (3.87) (85.35-100.52)	-
Violent/sexual charges 18-23	83.22 (3.75) (75.87-90.58)	4.16 (1)*
No charges 18-23	97.97 (2.22) (93.62-102.37)	-
Violent/sexual charges 24-29	78.68 (4.50) (69.86-87.51)	10.95 (1)**
No charges 24-29	96.31 (2.94) (90.55-102.08)	-
Violent/sexual charges 30-35	78.80 (2.54) (73.82-83.78)	15.43 (1)***
No charges 30-35	98.42 (3.15) (92.24-104.60)	-
Violent/sexual charges 36+	87.19 (2.55) (82.19-92.18)	.24 (1)
No charges 36+	92.39 (3.73) (85.07-99.71)	-

*+p < .10, *p < .05, **p < .01, ***p < .001*

4.4 Cox Proportional Hazards Analyses of Recidivism

Baseline Models. The next key step of analysis was to explore the predictive value of having a prior charge anywhere between the ages of 18 and 35, while adjusting for the sociodemographic covariates (i.e., social assistance, civil status, educational achievement and offender age at release) using Cox-regression models. The dependent variable used in these models, therefore, was length of survival in the community without reoffending. Separate models were conducted to determine the association between prior charges for nonsexual-nonviolent crimes and prior charges for violent/sexual crimes. The models illustrate that when controlling for the sociodemographic covariates nonsexual-nonviolent charges between the ages of 18-23 (OR = 1.16, 95% CI = .52-2.57), 30-35 (OR = 1.74, 95% CI = .79-3.83) and 18-35 (OR = 1.44, 95% CI = .61-3.41) were not predictive of violent/sexual recidivism (see Table 6). However, having at least one nonsexual-nonviolent charge between the ages of 24-29 (OR = 1.98, 95% CI = .92-4.26; $p < .10$) and age 36 and over (OR = 2.19, 95% CI = .95-5.04; $p < .10$) were moderately predictive of recidivism. As with the Kaplan-Meier survival analyses there is great similarity in the effect sizes between time periods with the most similarity between ages 24-29 and 36 and over. When examining prior violent/sexual charges during the time periods, while controlling for the sociodemographic covariates only having prior violent/sexual charges between the ages of 30-35 (OR = 2.64, 95% CI = 1.16-6.03; $p < .05$) was significantly predictive of violent/sexual recidivism, while also producing the largest effect size across all models tested. It should also be noted that having at least one violent/sexual charge between the ages of 18-35 was marginally predictive of violent/sexual recidivism (OR = 2.18, 95% CI = .91-5.23; $p < .10$). The effect sizes

between all other time periods were relatively similar with the lowest reported being for charges between the ages of 18-23 (OR = 1.48, 95% CI = .63-3.46).

In contrast, when conducting these analyses on the older sub-sample of offenders age 45 and over, neither prior nonsexual-nonviolent charges or prior violent/sexual charges were predictive of violent/sexual recidivism across any of the time periods, while the effect sizes were relatively stable across all time periods (see Appendix 4 & 5).

Table 6: Cox regression models comparing the impact of prior nonsexual-nonviolent charges predicting violent/sexual reoffending controlling for covariates for offenders age 36 and over (*n*=242)

	Model 1 Odds (95% CI)	Model 2 Odds (95% CI)	Model 3 Odds (95% CI)	Model 4 Odds (95% CI)	Model 5 Odds (95% CI)
Prior NSNV Charges					
18-23	1.16 (.52-2.57)	-	-	-	-
24-29	-	1.98 (.92-4.26)[+]	-	-	-
30-35	-	-	1.74 (.79-3.83)	-	-
36+	-	-	-	2.19 (.95-5.04)[+]	-
18-35	-	-	-	-	1.44 (.61-3.41)
-2 Log ML	225.26	222.37	223.53	222.13	224.67
X^2 (*df*), *p*-value	17.73 (5)**	20.55 (5)**	20.30 (5)**	19.62 (5)**	18.06 (5)**
R^2	.08	.09	.09	.09	.08

[+]*p* < *.10,***p < .01

Note that all models were run controlling for social assistance, civil status, educational achievement and offender age at release.

Note: NSNS = nonsexual-nonviolent

Table 7: Cox regression models comparing the impact of prior violent/sexual charges predicting violent/sexual reoffending controlling covariates for offenders age 36 and over (_n_=242)

	Model 1 Odds (95% CI)	Model 2 Odds (95% CI)	Model 3 Odds (95% CI)	Model 4 Odds (95% CI)	Model 5 Odds (95% CI)
Prior Violent/Sexual Charges					
18-23	1.48 (.63-3.46)	-	-	-	-
24-29	-	1.99 (.85-4.63)	-	-	-
30-35	-	-	2.64 (1.16-6.03)*	-	-
36+	-	-	-	1.57 (.64-3.85)	-
18-35	-	-	-	-	2.18 (.91-5.23)[+]
-2 Log ML	224.61	223.03	220.17	224.45	222.15
X^2 (_df_), _p_-value	18.63 (5)**	22.39 (5)***	25.93 (5)***	17.80	22.37 (5)***
R^2	.08	.00	.10	.08	.09

[+]_p_ < .10, *_p_ < .05, **_p_ < .01, ***_p_ < .001

Note that all models were run controlling for social assistance, civil status, educational achievement and offender age at release.

Comparing the Population Heterogeneity and State Dependent Processes. In the final stage of the analysis Cox-regression models were performed to compare the predictive impact of the sociodemographic covariates, as well as, prior charges across the four time periods. Again, for each of the models examined, length of survival in the community without being convicted for a violent/sexual crime was used as the dependent variable.

Nonviolent-Nonsexual Offending and Recidivism. First, Cox regression models were performed to determine the role of sociodemographic indicators and prior nonsexual-nonviolent charges on violent/sexual recidivism. The model showed that only two sociodemographic indicators were associated with recidivism: (a) education (OR = 3.43, 95% CI = 1.20-9.82; $p < .05$), and (b) offender age at release (OR = .93, 95% CI = .87-.99; $p < .05$) (Table 8). Accordingly, offenders who were younger at the time of their release, and more poorly educated, were more likely to reoffend. Interestingly, none of the four indicators of nonsexual-nonviolent criminal history were significantly predictive of reoffending, which given the emphasis of criminal histories in current actuarial tools was somewhat unexpected. Only one criminal history indicator approached significance (i.e., a prior charge between the ages of 24-29) (OR = 1.99, 95% CI = 1.90-4.40; $p < .10$); however, the marginal effect disappeared when adjusting for more recent criminal history events. The effect size was highest for educational achievement across all models tested and further was relatively stable across models. The lowest effect sizes were found among the prior nonsexual-nonviolent charges across all models ranging from .40-4.40.

Table 8: Cox regression models comparing the impact of prior nonsexual-nonviolent charges predicting violent/sexual reoffending for offenders age 36 and over (_n_=242)

	Model 1 Odds (95% CI)	Model 2 Odds (95% CI)	Model 3 Odds (95% CI)	Model 4 Odds (95% CI)	Model 5 Odds (95% CI)	Model 6 Odds (95% CI)
Social Assistance	2.95 (1.25-6.98)*	1.77 (.71-4.38)	1.71 (.68-4.32)	1.63 (.65-4.09)	1.54 (.61-3.89)	1.46 (.58-3.67)
Civil Status	1.64 (.76-3.51)	1.67 (.77-3.60)	1.69 (.78-3.68)	1.81 (.83-3.97)	.17 (.80-3.80)	1.90 (.86-4.20)
Education	3.20 (1.16-8.86)*	3.51 (1.27-9.70)*	3.45 (1.24-9.59)*	3.50 (1.25-9.83)*	3.33 (1.18-9.42)*	3.43 (1.20-9.82)*
Age at Release	-	.93 (.88-.99)*	.94 (.88-.99)*	.94 (.89-.99)*	.94 (.89-1.0)*	.93 (.87-.99)*
Prior NSNV Charges						
18-23	-	-	1.16 (.52-2.57)	.97 (.43-2.18)	.96 (.43-2.14)	.91 (.40-.03)
24-29	-	-	-	1.99 (.90-4.40)+	1.81 (.80-4.06)	1.61 (.70-3.73)
30-35	-	-	-	-	1.50 (.67-3.38)	1.43 (.63-3.26)
36+	-	-	-	-	-	1.84 (.78-4.36)
-2 Log ML	232.18	225.39	225.26	222.37	221.42	219.54
X^2 (_df_), _p_-value	11.79 (3)**	17.58 (4)**	17.73 (5)**	20.56 (6)**	22.42 (7)**	23.42 (8)**
R^2	.05	.08	.08	.09	.09	.10

+_p_ < .10, *_p_ < .05, **_p_ < .01, ***_p_ < .001
Note: NSNS = nonsexual-nonviolent

Nonviolent-Nonsexual Offending and Recidivism, in older Sub-sample. The

predictive impact of the covariates and prior charges for offenders age 45 and over were

examined using hierarchical Cox-regression modeling. When examining the association

between prior nonsexual-nonviolent charges, several important differences became

evident in comparison to offenders age 36 and over (Appendix 6). Firstly, across all

models offender age at release was not predictive of violent/sexual recidivism. Secondly,

unlike the younger offending group, civil status emerged as a predictor of recidivism (OR

= 7.78, 95% CI = .92-66.01; $p < .10$) (Appendix 7). Finally, prior nonsexual-nonviolent

charges across all observation periods were not predictive of recidivism, which is inline

with the findings reported in the baseline models. However, similar to the models tested

for offenders age 36 and over, education remained a marginal predictor of recidivism

(OR = 8.66, 95% CI = .77-96.90; $p < .10$). The effect size was highest for civil status

across all models, and as before, was lowest among the criminal history indicators.

Violent/Sexual Criminal History and Recidivism. The same model was computed

using Cox regression modeling, this time looking at the association between prior charges

for a violent/sexual crime while adjusting for the sociodemographic covariates. With

respect to prior violent/sexual charges a similar pattern emerged in terms of the

sociodemographic covariates as was reported for prior nonsexual-nonviolent charges

(Table 9). Educational achievement remained a significant predictor of recidivism (OR =

3.49 (1.22-9.95); $p < .05$), while offender age at release was a significant predictor of

recidivism until the inclusion of prior violent/sexual charges between the ages of 30-35 at

which point, and in the final model, it was no longer predictive of recidivism (OR = .94,

95% CI = .89-.1.0, p < .05). The effect size for educational achievement was highest

65

across all models tested. Compared to the pattern of findings observed for nonsexual-nonviolent charges there were some differences with respect to violent/sexual criminal histories across the observation periods. First, prior charges between ages of 18 to 23 (OR = .1.23, 95% CI =.50-3.03), as well as, 24 to 29 (OR = .1.49, 95% CI = .59-3.37) were not associated to reoffending in any of the models tested, which again was in line with the prior models tested, but still somewhat unexpected. Secondly, a prior charge for a violent/sexual crime between ages 30 and 35 when first entered in the model was significantly associated with recidivism (OR = 2.37, 95% CI = 1.01-5.56; $p<.05$). This factor remained marginally predictive of recidivism when adjusting for more recent criminal activities (age 36 and over) in the final model (OR = 2.31, 95% CI = .97-5.48; $p < .10$) – the effect size was relatively stable across both models. Again, in line with the models tested for nonsexual-nonviolent recidivism the effect sizes across the criminal history indicators, with the exception of the age 30-35 bracket, were the smallest across all models ranging from .47-5.56.

Table 9: Cox regression models comparing the impact of prior violent/sexual charges predicting violent/sexual reoffending for offenders age 36 and over (n=242)

	Model 1 Odds (95% CI)	Model 2 Odds (95% CI)	Model 3 Odds (95% CI)	Model 4 Odds (95% CI)	Model 5 Odds (95% CI)	Model 6 Odds (95% CI)
Social Assistance	2.95 (1.25-6.98)*	1.77 (.71-4.38)	1.64 (.65-4.13)	1.54 (.61-3.92)	1.45 (.56-3.78)	1.42 (.54-3.70)
Civil Status	1.64 (.76-3.51)	1.67 (.77-3.60)	1.68 (.78-3.63)	1.70 (.78-3.68)	1.70 (.78-3.70)	1.69 (.77-3.68)
Education	3.20 (1.16-8.86)*	3.51 (1.27-9.70)*	3.54 (1.27-9.83)*	3.34 (1.19-9.35)*	3.51 (1.23-9.99)*	3.49 (1.22-9.95)*
Age at Release	-	.93 (.88-.99)*	.94 (.98-.99)*	.94 (.89-1.0)*	.96 (.90-1.02)	.95 (.89-1.02)
Prior violent/sexual charges						
18-23	-	-	1.48 (.63-3.46)	1.31 (.55-3.12)	1.24 (.50-3.07)	1.23 (.50-3.03)
24-29	-	-	-	1.88 (.79-4.47)	1.53 (.62-3.79)	1.49 (.59-3.73)
30-35	-	-	-	-	2.37 (1.01-5.56)*	2.31 (.97-5.48)[+]
36+	-	-	-	-	-	1.20 (.47-3.04)
-2 Log ML	232.18	225.39	224.61	222.68	218.80	218.65
X2 (df), p-value	11.79 (3)**	17.58 (4)**	18.62 (5)**	22.60 (6)**	28.16 (7)***	28.25 (8)***
R2	.05	.08	.08	.09	.10	.10

+p < .10, *p < .05, **p < .01, ***p < .001

Violent/Sexual Offending, Recidivism in Older Sub-sample. Finally, the impact of prior violent/sexual charges, along with the covariates was examined for offenders age 45 and over. Civil status (OR = 7.78, 95% CI = .92-66.01; p < .10) and educational achievement (OR = 8.66, 95% CI = .77-96.90; p < .10) remained predictors of recidivism, as in the model tested for offenders age 36 and over, while the effect of age at release disappeared (Appendix 7). Similar to the reported findings for prior nonsexual-nonviolent charges, across all models and observation periods' prior violent/sexual charges were not predictive of violent/sexual recidivism. In other words, and of importance, when removing the younger offenders from the sample (i.e., age 36-44), the effect of criminal history on recidivism disappears.

CHAPTER 5: DISCUSSION

5.1 Describing the Particularities of the Sample of Adult Sexual Aggressors

The sample for this analysis was comprised of both sexual aggressors of women and sexual aggressors of children who had been convicted of a sex crime and sentenced to a federal penitentiary in Quebec, Canada where they were incarcerated for no less than two years. The characteristics of this sample are of interest and merit discussion prior to the presentation and interpretation of the findings of this study in light of findings presented in prior research. More specifically, this sample presented some characteristics that were distinct from those found in earlier studies examining the association between criminal history and recidivism. First, unlike prior studies examining the impact of prior convictions, or charges, on sexual offender recidivism outcomes, which have utilized purely forensic (Hall, 1988; Hall & Proctor; 1987; Proulx et al., 1997; Quinsey et al., 1995) or both forensic and correctional samples (Hanson 2006; 2002; Harris & Rice, 2007), the offending population utilized in this analysis was purely a correctional sample (Barbaree et al., 2009, Lussier & Healey, 2009). As such, the findings of this analysis are most generalizable to adult sex offenders found in federal penitentiaries across Canada.

Second, on average offenders were 48 years old at their time of release from incarceration. This average age is higher than those reported in previous empirical studies, which tend to be in the mid-thirty range, approximately between ages 35-37 (Barbaree et al., 2003; Barbaree et al., 2009; Hall, 1988; Hall & Proctor; 1987; Hanson, 2006; 2002; Harris & Rice, 2007; Proulx et al., 1997; Quinsey et al., 1995, see however,

69

Lussier & Healey,2009).[7] Third, the current sample has more extensive nonsexual-nonviolent, sexual and violent criminal histories than those reported by Hall & Proctor (1987) and Quinsey et al. (1995), which might be attributable to differences in the sampling of offenders (forensic populations). However, the criminal histories of the current sample are more in line with those presented by Proulx et al. (1997) whose sample is based on a forensic population of convicted sex offenders. The similarities in the criminal histories may be attributed to the fact that both samples had higher proportions of heterosexual child molesters.

Bivariate statistical analyses were performed to better understand the sample of adult sex offenders included in this study. Of interest, were the associations between criminal career indicators at different time points in the sex offender's past and their relationship to recidivism outcomes. To my knowledge, this is the first study to examine the retrospective longitudinal patterns of offending at different time points in a sample of adult sex offenders (see however, Lussier & Amirault, 2010). Preceding recidivism studies have tended to overlook such patterns by collapsing all criminal history information under umbrella terms, such as "any prior sexual conviction", "number of prior convictions", etc. (Hanson & Bussiere, 1998; Hanson & Thornton, 2000; Quinsey et al., 1998). Furthermore, and in line with research showing that sex offender's criminal activity is not restricted to sexual offending (Lussier, 2005; Miethe et al., 2006; Simon, 1997), the study examined both offenders' sexual and non-sexual offending histories.

The study findings showed that first, for both prior nonsexual-nonviolent and

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[7] It should be noted that the same sample population used in the Lussier & Healey (2009) study was used here; however, Lussier & Healey (2009) utilized the full sample of offenders – only offenders age 36 and over were selected for this analysis.

violent/sexual charges, offending continuity was found as the observation periods of 18-23, 24-29 and 30-35 were all positively and significantly correlated with each other. In other words, individuals offending at one time point were also those offending at subsequent time points. Of note is the fact that retrospective data tends to overestimate the continuity of offending that is typically found in longitudinal studies (see Moffitt, 1993). In this regard, indications of discontinuity were also found as the correlations reported were not as strong between adjacent temporal periods (i.e., age 18-23 and 24-29), and the strength of these correlations were even smaller for non-adjacent periods (i.e., age 18-23 and age 30-35). The imperfect association between past measures of offending could be attributed to the fact that the study did not take into consideration periods of incarceration. However, such an issue cannot account for the fact that the pattern of associations between non-adjacent periods was lower than adjacent ones. This decreasing trend could be interpreted as changing levels of participation in criminal activities over time.

The pattern of association between individual characteristics and past offending was also informative with respect to the sociodemographic characteristics of the most criminally active offenders. Several studies have reported that the offender's intimate relationship status, most specifically being single, can be a predictor of sexual recidivism (Hanson & Bussiere, 1998). In fact, the SORAG (Quinsey et al., 1998), the Static-99 (Hanson & Thornton, 2000) and the Risk Matrix 2000 (Thornton et al., 2003) all include factors that measure the lack of previous long-term intimate relationships as a risk factor for future recidivism. In the current study, this marker was unrelated to past offending at various time points. Hence, while being single might be a predictor of persistence, it

appears that it is not a predictor of participation and past involvement in both nonsexual and sexual offending.

Furthermore, education was weakly correlated to both prior nonsexual-nonviolent and violent/sexual charges during the observation periods, but was more strongly related to the presence of a violent/sexual charge between the ages of 18-35. Is education an important factor of adult offending? The findings of this study may indicate that while a poor educational background might not increase participation in crime during a specific time period, it does have a general cumulative impact on criminal participation at some point before age 36. Accordingly, the impact of education might not be time-specific.

The two most informative individual factors associated with past offending were social assistance and the offender's age at their time of release from prison. Thus, receiving social assistance and being younger at the time of release were associated with both prior nonsexual-nonviolent and violent/sexual charges. Simply put, both factors were associated with sexual and nonsexual offending. Both age and unemployment have consistently been associated with general offending over time (e.g., Sampson & Laub, 2005; 1997; 1993). However, in the context of the current study these factors might be tapping into something relatively stable about the likelihood of committing sexual and nonsexual offences. As such, receiving social assistance at the time of the crime that lead to the most recent incarceration was associated with past offending. It is unclear here whether social assistance lead to offending, or simply whether past offending, and the consequences of past offending, (i.e., criminal record, period of incarceration) lead to the need for social assistance. The complexities of such association have been described by

life-course researchers (Sampson & Laub, 1993) and only longitudinal data on both social assistance and offending could help disentangle these findings.

Furthermore, age at release was also linked to a more extensive sexual and nonsexual criminal background. Offenders released at a younger age had more extensive criminal histories than those released when they were older, suggesting that there might be distinct groups of offenders. Older sex offenders included in the study might be more inclined to a pattern of occasional sporadic offending while younger offenders might be characterized by a pattern of more chronic and persistent offending.

The association between the offender's age at release to prior offending further reinforced the decision to run separate analysis for a sub-sample of older sex offenders. The pattern of correlations found for offenders age 45 and over reinforce the fact that there might be both similarities and significant differences between the older and the younger sample of offenders. Similarly, the reported pattern of association between criminal history measures was in line with those found for the full sample. More specifically, both the patterns of continuity and discontinuity found for the full sample were also found when removing the offenders younger than 45 years old from the sub-sample. These processes, therefore appear to apply even when with offenders who are at a minimum of 45 years old.

However, dissimilarly, the relationship between offender age at release, social assistance and past offending was not replicated here. As such, the removal of the younger offenders from the sub-sample (35-44 years old) was enough to impact the observation that criminal histories were more extensive in offenders younger at their time of release and for those receiving social assistance at the time of their most recent crimes.

73

The fact that age at release might be indicative of intrinsic differences between offender age groups reinforces the notion that Harris and Rice (2007) might have been incorrect in their conclusion that age at release is irrelevant to the risk assessment and risk prediction of sexual reoffending.

5.2 Recidivism in Adult Sexual Aggressors and Associated Factors

As previously noted the offenders in this sample had extensive criminal histories. Between the ages of 18-35 51.7% of the offenders age 36 and older had at least one prior nonsexual-nonviolent charge, while 42.6% of the older sub-sample had a prior nonsexual-nonviolent charge during the same time period. Furthermore, between the ages of 18-35 38.4% of the offenders age 36 and over had at least one prior violent/sexual charge while 24.3% of offenders age 45 and over had a prior violent/sexual charge. However, of the offenders age 36 and over only 29 offenders (12%) were convicted of a subsequent violent/sexual offense during the approximately 5 year follow-up period, while only 11 offenders (8%) in the older sub-sample had a subsequent violent/sexual conviction during the follow-up period. Comparatively, only 13 offenders (5.4%) age 36 and over received a sexual conviction during the follow-up period while only 4 (2.9%) of the offenders in the older sub-sample received a new sexual conviction during the follow-up period. These rates of both violent/sexual recidivism, and sexual recidivism only, are lower than what has previously been reported with a similar length of follow-up period (Barbaree et al., 2003; Hall, 1988; Hall & Proctor, 1987; Hanson 2006; 2002; Hanson et al., 1995; Lussier & Healey, 2009; Proulx et al., 1997; Quinsey et al., 1995). The lower rates of recidivism can perhaps be attributed to the fact that the offender's in this sample are, on average, 10 years older than those utilized in previous sex offender recidivism

studies (Barbaree et al., 2003; Barbaree et al., 2009; Hall, 1988; Hall & Proctor; 1987; Hanson, 2006; 2002; Harris & Rice, 2007; Proulx et al., 1997; Quinsey et al., 1995). The findings of this study are in line with the desistence process of offending reported by life-course theorists who observe that all offenders, even the most serious and violent, eventually begin a process of desistence as they age (Laub & Sampson, 2003; Sampson & Laub, 2005).

Bivariate Associations and Risk of Recidivism. Bivariate analyses of the factors associated with recidivism revealed that offenders who were younger at the time of their release, who had a history of receiving social assistance and who were less educated were more likely to commit a new violent/sexual crime during the follow-up period. Consequently, social assistance and age at release were related to both past and future offending, and to a lesser extent, education was as well. Therefore, there were some consistencies in the risk factors associated with offending over time. Furthermore, prior offending measures were associated with recidivism, in line with actuarial studies that emphasize criminal records as a central static risk factor determining the risk of recidivism (Epperson et al., 1998; Hanson, 1997; Hanson & Thornton, 2000; Quinsey et al., 1998; Thornton et al., 2003).

Here two results related to the association between past and future offending were of note. First, as expected, the presence of violent/sexual charge between the ages of 18-35 was more associated with recidivism than having a nonsexual-nonviolent charge between the ages of 18-35. This is in line with prior studies which give more weight to static risk factors measuring past violent and sexual offending in the prediction of sexual recidivism (Hanson & Thornton, 2000; Quinsey et al., 1998). This suggests some stability

75

in offending over time. Second, when examining the effect size of prior offending on recidivism, there was an observed increasing trend over time, with more recent criminal history indicators being more associated than earlier ones, of which the effect was more pronounced for violent/sexual offending histories. In fact, the effect size for having any violent/sexual charges between the ages of 18-35 was the same as having a prior violent/sexual charge in the most recent six-year time period (i.e., ages of 30-35). This result is in line with Lussier & Amirault's (2010) earlier observations showing that more recent violent/sexual charges appear to be more predictive than those in the more distant past.

When examining the bivariate analyses between the covariates and violent/sexual recidivism for offenders' age 45 and older several differences were found. First, it was found that while education remained marginally associated with violent/sexual recidivism social assistance was no longer predictive of it. In other words, the removal of the younger offenders from the sample (ages 36 to 44) impacted the role, and significance, of social assistance on recidivism, but not subsequently on education. Therefore, while education was not strongly linked to violent/sexual recidivism, this pattern of findings suggests that its effect might be operating across age groups. Social assistance might no longer be associated with reoffending considering that it is a more dynamic predictor of reoffending. More specifically, younger offenders who had a history of social assistance might have had a more difficult time finding a job after their prison release than older offenders, who were closer to retirement at the time of their release. Empirical studies have shown that income and employment problems are associated with short-term recidivism (Zamble & Quinsey, 1997).

Civil status also emerged as significantly associated with violent/sexual recidivism. Only 1.9% of offenders who were with a partner during the follow-up period recidivated. This change may indicate that once offenders pass a certain age civil status is indicative of a protective factor against recidivism. The changing association of social assistance and civil status to recidivism suggests that perhaps certain sociodemographic factors may be more or less important at different points throughout the life-course.

The passage of time appears to have affected the role and association of a prior offence. Indeed, prior violent/sexual charges also became less associated to recidivism as the offenders aged. These results may be indicative of the presence of a state dependent process whereby the changing context of human lives (Sampson & Laub 2005; 1997; 1993) may reduce the impact of a prior criminal offence on the subsequent likelihood of reoffending.

Offender Characteristics, Criminal History and Length of Survival. Survival analyses were conducted to determine the role and impact of offender's characteristics and criminal histories on their time spent in the community without reoffending. When considering the criminal history indicators, those offenders who had prior nonsexual-nonviolent charges between the ages 18-35 recidivated approximately 14 months faster than those who recidivated but did not have any prior charges. Having prior nonsexual-nonviolent charges between the ages of 18-23 was only of marginally related to the length of survival time, while more recent criminal history indicators were significantly related to it. Moreover, when looking at prior violent/sexual offending, the presence of a prior charge between the ages of 18 and 35 was also associated with a shorter survival time in the community. When looking at prior charges in each time period, the presence

of violent/sexual charges between the ages of 30-35 seemed to most accelerate offender recidivism (those without a prior charge for a violent/sexual crime lasted on average 20 months longer in the community). If age of onset is operationalized as any charge between the ages of 18 and 23, then the findings of this study do not provide substantial support for an early onset effect. This would be in contrast to the findings and conclusions of Harris & Rice (2007) who argued that sex offender's age of onset is an indicator of the propensity of an individual to reoffend which is stable across age groups. In this analysis the effect of adult age of onset disappears when controlling for the passage of time suggesting that the impact of more distant violent/sexual charges on future offenses are lost as offenders age. Findings from the analyses conducted with the subsample of offenders age 45 and over are in line with this conclusion.

5.3 Modelling Population Heterogeneity and State-Dependent Processes

The main research question of this study was to determine, and compare, a population heterogeneity model and a state dependent model to the prediction of violent/sexual recidivism. To do so, a hierarchical procedure was used using Cox proportional hazards to compare and contrast the role of prior offending histories on recidivism, after adjusting for covariates (i.e., sociodemographics). To my knowledge, this is the first empirical study examining the role of prior sexual and nonsexual offending at different time points throughout the life-course on recidivism using hierarchical modeling. When comparing the sociodemographic covariates, the only predictors of violent/sexual recidivism to emerge from the models testing the predictability of prior nonsexual-nonviolent charges for offenders age 36 and over, were educational achievement (OR = 3.43, 95% CI = 1.20-9.82; $p < .05$) and offender age at

78

release (OR = .93, 95% CI = .87-.99; $p < .05$). When examining the predictability of prior violent/sexual charges for the same offender group, of the sociodemographic covariates, only educational achievement was predictive of recidivism (OR = 3.49, 95% CI = 1.22-9.95; $p < .05$). For the older sub-sample educational achievement was again predictive of recidivism, albeit only marginally, while civil status was also a marginal predictor of recidivism - these findings are consistent between the models tested for prior nonsexual-nonviolent charges and violent/sexual offenses.

Also of note is the fact that social assistance was predictive of violent/sexual recidivism, in all models tested for both the younger and older offenders, until offender age at release was entered into the models. This suggests that there may be an age effect between social assistance and older offenders. This reinforces the earlier conclusion that social assistance might be contributing to recidivism for only the younger sex offenders. Past a certain age, this risk factor might become irrelevant to the prediction of recidivism. This finding is in line with a life-course view of offending and associated contributing factors.

Population heterogeneity and the state dependent processes were tested for both the nonsexual-nonviolent offending and violent/sexual offending history indicators. Prior actuarial studies on the prediction of recidivism tend to collapse criminal histories into a single indicator, irrespective of the time period or the offender's age at the time of the prior offence (Epperson et al., 1998; Hanson, 1997; Hanson & Thornton, 2000; Quinsey et al., 1998; Thornton et al., 2003). Therefore, this is one of the first studies to compare the effects of prior offending while controlling for the offender's age at the time of previous charges (see also Lussier & Amirault, 2010). First, when looking at the presence

of a population heterogeneity and state dependent process with respect to prior nonsexual-nonviolent offending, the results showed more evidence for a state dependent process. Indeed, after adjusting for sociodemographics, entering prior nonsexual-nonviolent offending did not significantly impact the predictive value of the model. In fact, none of nonsexual-nonviolent criminal history indicators were significantly predictive of recidivism after adjusting for the sociodemographic covariates. Accordingly, offenders who were less educated and younger at the time of their prison release were more likely to reoffend independently of prior nonsexual-nonviolent charges.

Consequently, an early-onset of nonsexual-nonviolent offending (between the ages of 18-23) was not predictive of reoffending, and thus does not support the population heterogeneity hypothesis that an early onset of offending is indicative of a stable propensity to reoffend. The lack of continuity between past and future offending is more in line with state dependent process which states that changing contextual factors and increasing informal social control can act as protective factors against a future offense, in spite of prior criminal history (Laub & Sampson, 2003; Sampson & Laub 2005: 1997: 1993). It could, however, be argued that a specific propensity for violent/sexual offending is responsible for sexual offenders' tendencies to reoffend and, as a result, a population heterogeneity hypothesis can only be properly examined using prior violent/sexual offending as the independent variables.

When considering the predictive impact of prior violent/sexual charges when controlling for the sociodemographic covariates a somewhat different picture emerges. After controlling for the sociodemographic covariates the early onset of adult

violent/sexual offending was found not to be predictive of future offending past age 35

(OR = 2.31, 95% CI = .97-5.48; $p < .10$). Evidence of a population heterogeneity

hypothesis stating that a specific propensity for violent/sexual offending might be a

contributing factor to the early onset of, and subsequent offending of individuals, was not

supported. This is not to say that an early onset is never predictive of reoffending, as it

has been shown to be the case (Lussier & Healey, 2009; Harris & Rice, 2007); however,

this predictive value might cease to exist with the passage of time, which was controlled

for in this study by looking only at offenders who were at least 36 years old. This

modeling is more indicative of a state dependent process, which suggests that there is

something unique about having a prior charge between the ages of 30-35. This finding

may be attributed to the fact that charges during this time period have the potential to be

more damaging to offenders in the long term. As such, it is reasonable to presume that for

many offenders their occupational careers are better established during this time period

and that a criminal charge at this point in the life-course could be more damaging to

future occupational prospects than charges in earlier adulthood.

Charges occurring in the most recent observation period that was not impacted by

residuals, age 30-35, may be more indicative of the current state of individual's offending

trajectories. An offender's current state may simply be the best predictor of future

offending. It is important to note that Allison's pseudo R^2 is relatively low across the

models. The strength of the association across the models, after the inclusion of the

sociodemographic covariates, ranges from .08 - .10. The inclusion of prior violent/sexual

charges does not dramatically increase the predictive value of the model. Although it

would have been expected that the age 36 and over observation period would have been

predictive it was not, possibly due to residuals in the observation period. Taken together the Cox-regression models suggest that the relationship between prior nonsexual-nonviolent offending and prior violent/sexual offending and future violent/sexual offending is imperfect – violent/sexual offending is transitory.

Finally, when considering the findings of the Cox-regression models comparing the sociodemographic variables to prior nonsexual-nonviolent charges for offender's age 45 and older the findings were somewhat different. Similar to the previous models discussed for the younger offenders the sociodemographic factors (educational achievement; OR = 7.78, 95% CI = .92-66.01; $p < .10$) were better predictors of recidivism than prior nonsexual-nonviolent and violent/sexual charges; however, unlike the younger offenders being single was also predictive of recidivism for the older offenders. Neither offender age at release nor any prior charges (nonsexual-nonviolent, violent/sexual) were predictive of future offending. The fact that past offenses were unrelated to recidivism outcomes may in part be related to the small sample size and the small number of recidivists in these analyses. Nonetheless, the lack of association between prior charges and violent/sexual outcomes may be indicative of a state dependent process where older prior charges may lose their predictive value over time.

5.4 Implications

The findings of this thesis are in line with current actuarial tools utilized in the assessment of sex offender risk to the extent that these tools identify prior violent/sexual charges as better predictors of violent/sexual recidivism outcomes than prior nonsexual-nonviolent offenses. Of the five most commonly used actuarial risk assessment tools applied to sex offenders (RRASOR, Static-99, Risk Matrix 2000; SORAG & MnSTOST-

R) all include measures of prior sexual offenses. However, the transitory nature of violent/sexual offending found here, coupled with the finding that the most recent violent/sexual charges in an offender's criminal career were the best predictors of violent/sexual recidivism suggests that the inclusion of all prior violent/sexual charges in an offenders criminal history, regardless of when they occurred in the life-course, may result in the overestimation of offender risk. The findings presented in this thesis raise concerns with the current practice of simply identifying the number of prior charges, or convictions, that an offenders has in their criminal history. Is a cumulative count of prior criminal incidents, regardless of when they occurred, the best way to determine offender risk? The findings of this study would suggest that this is not the case. Accordingly, the accuracy of actuarial risk assessments may be improved by taking into consideration the timing of prior charge and convictions in the life-course of offenders and by giving less predictive weight to offenses that have occurred in the more distant past.

When comparing the predictive impact of offender age at release to prior charges in line with the findings of Lussier & Healey (2009) offender age at release was found to be a better predictor of recidivism than even prior violent/sexual charges, and remained a better predictor of recidivism than prior charges even when the younger offenders (those perceived to be at a higher risk of reoffending) were removed from the sample. While the RRASOR, Static-99, Risk Matrix 2000; SORAG & MnSTOST-R all include components of offender age as a factor in their assessment in general these measures are dichotomized, being younger or older than a given point either increases or decreases risk scores, but these measures are not adjusted as offenders continue to age. As such, offenders who are age 30 or 35 are scored in the same way as offenders who are 50 or 60.

Thus, including weighted age scales could further help to improve the predictive accuracy of actuarial risk assessment tools. Offenders who are age 60 at their time of release could be assigned even lower risk scores than offenders who are age 40 at the time of their release. The inclusion of weighted age scales is further supported by the findings of Hanson (2006) who has reported that the Static-99 can (and does) overestimate the recidivism risk of older offenders.

In 2000 Nagin and Paternoster presented 'a modest agenda for future research' consisting of five components - one of which was the identification of specific life-events and experiences than have the potential to facilitate offender desistence. While it is premature to suggest that completing high school, finding stable employment and finding a stable partner characterize such events and experiences for all, or even most, sex offenders this, study represents a first step in the attempt to fill this conceptual void. One of the most valuable findings to emerge from this analysis is the predictive ability, and the changing predictive role, that the sociodemographic factors of social assistance, educational achievement and civil status had for violent/sexual recidivism. The value of a stable and cohesive marriage as a protective factor from criminal involvement, and as a transitionary social institution to offender desistence, has been readily documented in the life-course literature (Blokland & Nieuwbeerta, 2005; Horney, Osgood & Marshall, 1995; Laub et al.,1998; Laub & Sampson, 2003; 2001; Maruna & Roy, 2007; Sampson & Laub, 2005, 1997; 1993, 1990). The importance of job stability as a mechanism of general offender desistence has also been recognized by Sampson & Laub (2005, 1997, 1993, 1990), Laub & Sampson (2003, 2001) and Uggen (1999). Kruttschnitt, Uggen &

Shelton (2000) have also reported the positive effects of job stability in the desistence process specific to a sample of sex offenders.

However, in general factors such as social assistance (unemployment) and educational achievement, which have repeatedly been shown to be related to offending persistence and desistence within general criminal populations, have seemingly been excluded in their application to sexual offenders. Although Hanson and Bussiere (1998) report that being single was associated with sexual recidivism, of the 61 empirical studies included in their meta-analysis only eight studies included being single as a risk factor, only seven studies included measures of educational achievement, while only six studies evaluated the impact of employment instability on recidivism outcomes.

Although the results of Hanson and Bussiere's (1998) analysis do not report evidence as strong as the findings are here in support of these sociodemographic factors Hanson and Bussiere have not considered these factors at different stages throughout the life-course. The findings of these analyses indicate that both socioeconomic factors, as well as an offender's civil status, function differently at different time points as offenders' age, and as such, the aggregation of these factors in Hanson & Bussiere's (1998) meta-analysis may not accurately depict the role of these factors over the life-course. The failure of current actuarial risk assessment tools to sufficiently capture the dynamic aspect of offender's lives has been raised by Zamble and Quinsey (1997), Proulx et al. (1997) and Proulx et al. (2000). While the current usage of dynamic risk factors in risk assessment tools are primarily concerned with issues such as affective states, cognitive distortions and deviant sexual interests (Beech et al., 2003; Hanson & Harris, 1998; Proulx et al. 1997; Zamble & Quinsey, 1997) the current study supports the

need for further inquiry as to inclusion of more general life-circumstance contextual factors in risk assessments as well.

The potential to more accurately identify offender recidivism risk also gives rise to the potential to better manage sex offenders once released into the community. In light of the current mechanisms of control that sex offenders are subject to upon their return to the community (sex offender registries, community notifications, DLO, LTO, 810 orders) an over classification of risk could have meaningful collateral consequences for the reintegration of these offenders. Although the consequences of management strategies on offender recidivism have not fully been examined in the Canadian context preliminary empirical analyses from the USA indicates that sex offender registries, community notifications and residency restrictions do not meaningfully reduce recidivism rates but do negatively impact offender's abilities to find suitable housing, develop prosocial relationships and find stable employment (Levenson & Cotter, 2005; Levenson, D'Amora & Hern, 2007; Levenson & Hern, 2007; Levenson, Zgoba & Tewksbury, 2007; Tewksbury, 2007, 2005; Tewksbury & Ehrhardt Mustaine, 2006; Tewksbury & Lees, 2007; 2006; ; Zevitz, 2006; Zevitz, Crim & Farkas, 2000; Zevitz & Farkas, 2000; Zgoba, Levenson and McKee, 2009). Given the relationship between offender age and the desistence process presented here should offenders who are in their 50s and 60s be compelled to register as sex offenders or be subject to extended supervision upon their return to the community? Just the utility of the inclusion of sociodemographic factors in risk assessment tools warrants future empirical research, so to do the effects of sex offender management strategies on recidivism rates and the necessity of such measures

86

for offenders who are older at the time of their return to the community, which at present remain unknown.

Taken together, the methodological decision to divide the criminal careers of offenders into temporal periods has proven useful not only for the comparison of population heterogeneity and state dependent processes, but also as a potential technique to better classify the risk of sex offenders. While initially atheoretical in conceptualization the identification of early adulthood, (ages 18-23) as an observation period, is in line with the time period that has been recognized as the most criminally active for most offenders (Hirschi & Gottfredson, 1983), and of which offenses in this time period are perhaps most indicative of a time stable criminal propensity characteristic of a population heterogeneity perspective. Further, identification of the most recent temporal period in which a charge was received, that does not include residual offending, ages 30-35, emerged as the time period most predictive of recidivism - akin to a state dependent process which considers the changing impact of criminal involvement on future criminal outcomes. Thus, the utility of these temporal periods for describing and measuring a criminal career is informed by two commonly accepted explanations of criminal involvement over time.

Finally, the presence of population heterogeneity and state dependent processes found in this study requires further attention. While the Cox-regression models tested here provide support for discontinuity in offending and state dependent processes, as prior criminal involvement was not predictive of future offenses, support for population heterogeneity and offending continuity was also found as those offenders who were involved in criminal activity at one point were also those involved at subsequent time

87

points. As such, the sample utilized in this study is perhaps best characterized by a mixed model of offending of which Bushway et al. (1999), Nagin and Paternoster (2000, 1991) and Piquero et al. (2003) suggest offers the best understanding of offending continuity and change over time. While differences in criminal propensities may be the catalyst for initial offending the consequences of these behaviors may either be exacerbated or reduced life circumstances (Bushway et al., 1999; Laub & Sampson, 2003; Nagin & Paternoster, 2000; 1991; Sampson & Laub, 2005; 1997; 1993). Accordingly, offenders who were perhaps more prone to antisocial behaviors and who were continually characterized by prosocial deficits (not completing high school, not being able to maintain a job, failure to develop long term intimate relationships) were those who continued to offend, while regardless of initial inclinations for antisocial behaviors, those with stability in these prosocial areas entered a process of desistence, as all offenders eventually do.

5.5 Limitations

Like any empirical study this analysis is not without methodological limitations. Due to the low base rate of prior violent and sexual charges and recidivism, and to account for the possibility of offender peal bargaining processes, these two charge categories and recidivism outcomes were merged. This is in line with prior empirical studies (Hall, 1988; Lussier, 2005; Lussier & Davies, 2010; Lussier & Healey, 2009; Quinsey et al. 1998). Retrospective criminal career data (nonsexual-nonviolent, violent/sexual charges) and the recidivism outcome of interest (a new violent/sexual conviction) were comprised of official data sources only (RCMP records), which inevitable underestimates the true number of crimes an offender has committed and the

actual rate of offender recidivism; however, the use of official data to compile criminal histories, and as a measure of recidivism, is in line with prior empirical studies (Craig, 2009; Firestone et al., 1998; Hall, 1988; Hall & Proctor 1987; Hanson, 2002; Lussier & Amirault 2010; Lussier & Healey, 2009; Lussier et al., 2010; Proulx e al., 1997; Soothill & Gibbens, 1978; Thornton, 2006). Although the number of offenders included in this study is moderate in comparison to other empirical evaluations exploring the relationship between prior criminal involvement and future offender outcomes the small number of offenders included in the comparison group of offenders age 45 and over reduced statistical power for those analyses - a consideration that was accounted for when interpreting findings. In line with the minimum length for a follow-up period suggested by Proulx et al. (2000) the average length of follow-up period in this analysis was five years. However, a longer follow-up period inevitably would have increased the number of offenders who subsequently recidivated. Doren (2002) presents that often half of the recidivism that occurs in a sample does so after the first five years of a follow-up period have elapsed. Unlike prior studies evaluating the impact of prior criminal involvement on recidivism outcomes (Hall, 1988; Hall & Proctor, 1987; Quinsey et al., 1995) this analysis utilized a purely correctional sample. As such, the generalizability of these findings are most applicable to federally sentenced sex offenders in Canadian penitentiaries.

5.6 Future Directions

In light of the findings reported in this analysis future empirical studies examining the link between sex offenders prior criminal activities and recidivism outcomes should take into consideration the timing of prior offenses, the amount of time that has elapsed

since the occurrence of a prior offense (akin to the aging processes of offenders) and the impact of offender age at release. While this study was comprised of both aggressors of adult women and those who target children differences in the desistence processes of these groups of offenders, and the extent to which the predictive impact of prior nonsexual-nonviolent and violent/sexual lessens over time, requires further methodological exploration. The dynamic aspect of offenders' lives, as well as, the changing role that sociodemographic factors such as receiving social assistance, educational achievement and civil status have in recidivism outcomes also requires further empirical exploration to determine if and how these factors that should be considered when evaluating sex offender risk.

CHAPTER 6: CONCLUSION

This thesis represents the first time that prior nonsexual-nonviolent and violent/sexual charges during specific temporal periods in the life-course (ages 18-23, 24-29, 30-35, 36+) were examined to establish their predictability of violent/sexual recidivism, and the extent to which population heterogeneity or state dependent processes are representative of the criminal careers of sexual offenders. In doing so six key questions were considered. First, the impact of past criminal involvement on future criminal involvement was explored. The findings of this thesis are more in line with that of a state dependent process to the extent that a transitory and imperfect relationship between prior and future offending was found. Prior nonsexual-nonviolent and violent/sexual charges were not indicative of future offending. Secondly, the effects between offender aging, prior nonsexual-nonviolent and violent/sexual charges and violent/sexual recidivism was considered. These results indicate that as offenders age the predictive nature of more distant prior charges disappear. This is related to the third question posed as to whether or not there is an expiry date to the predictive value of prior nonsexual-nonviolent and violent/sexual charges. These results indicate that nonsexual-nonviolent and violent/sexual charges occurring in early adulthood (between the ages of 18-23) are no longer predictive of future offending as offenders' age. When comparing the two offending groups the impact of earlier charges was even less evident for the older (age 45+) offending group. As expected, prior violent/sexual charges were better predictors of violent/sexual recidivism than prior nonsexual-nonviolent charges; however, charges in the most recent observation period (ages 30-35) were the best predictors of recidivism and significantly decreased the survival time of offenders in the

community – an outcome addressing the fifth question posed as to whether more recent charges are more predictive than those occurring in the more distant past. Finally, whether or not a simple count of prior nonsexual-nonviolent charges and violent/sexual charges (the approach currently used in actuarial risk assessments) is more or less predictive than considering the timing at which these offenses occurred was explored. While having nonsexual-nonviolent and violent/sexual charges between the ages of 18-35 were predictive of violent/sexual recidivism when comparing the impact of prior charges during the four observation periods to the sociodemographic covariates the predictive impact of prior nonsexual-nonviolent and violent/sexual charges was all but lost. The only marginal predictor of violent/sexual recidivism was having prior violent/sexual charge between the ages of 30-35 in the age 36 and over offending group.

Lastly, the importance of social assistance, educational attainment, civil status and offender age at release provide empirical support to the fact that criminogenic factors that have continually been found to be related to the desistence process of general offending populations are applicable to sexual offenders as well. While the extent, and the methods, to which these factors should be included in the risk assessment of sex offenders requires further clarification what becomes increasingly apparent is that the dynamic aspects of sexual offenders criminal careers can no longer be ignored.

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APPENDICES

Appendix 1: Correlation Matrix of Covariates, Offenders age 45 and over (n=136)

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Social Assistance	-													
2. Civil Status	.07	-												
3. Education	.11	-.16	-											
4. Offender age at release	-.31**	-.08	.10	-										
5. Length of follow-up	.04	-.10	.09	.05	-									
6. NSNV charges (18-23)	.29**	-.10	.14	-.21*	-.06	-								
7. NSNV charges (24-29)	.21*	.01	.10	-.16	.02	.36**	-							
8. NSNV charges (30-35)	.15	-.03	.12	-.09	.03	.31**	.47**	-						
9. NSNV charges (36+)	.09	-.02	.09	-.11	.03	.20*	.29**	.27**	-					
10. Violent/sexual charges (18-23)	.18*	-.11	.01	-.29**	-.08	.51**	.29**	.16	.21*	-				
11. Violent/sexual charges (24-29)	.21*	-.06	.11	-.19*	-.09	.25**	.52**	.26**	.13	.32**	-			
12. Violent/sexual charges (30-35)	.16	.05	-.00	-.14	-.14	.23**	.31**	.51**	.06	.28**	.41**	-		
13. Violent/sexual charges (36+)	.17*	.13	.11	-.03	-.13	.13	.35**	.33**	.40**	.16	.09	.18*	-	
14. Nonsexual-nonviolent charges (18-35)	.26**	-.03	.07	-.30**	-.12	.44**	.44**	.39**	.16*	.71**	.55**	.69**	.20*	
15. Violent sexual charges (18-35)	.37**	.03	.20*	-.23*	-.04	.66**	.70**	.63**	.35**	.38**	.36**	.37**	.39**	.55**

Note. NSNV = Nonsexual, nonviolent.
*$p < .05$, ** $p < .01$

Appendix 2: Proportion of violent/sexual recidivism rates of offenders age 45 and over (n=136)

	% (Violent/Sexual recidivism)	X^2	Phi	OR (95% CI)
Social assistance (1, Receiving)	12.5%	2.49	.14	2.71 (.76-9.76)
Social assistance (0, Not Receiving)	5.0%	-	-	-
Civil Status (1, No partner present)	12.2%	4.69*	.19	7.36 (.91-59.28)
Civil status (0, Partner present)	1.9%	-	-	-
Education (1, Not completed high school)	11.0%	3.11[+]	.15	5.43 (.67-43.84)
Education (0, Completed high school)	2.2%	-	-	-
Nonsexual-nonviolent charges 18-35	12.1%	2.12	.13	2.54 (.71-9.13)
No nonsexual-nonviolent charges 18-35	5.1%	-	-	-
Violent/sexual charges 18-35	15.2%	2.92[+]	.15	2.89 (.82-10.17)
No violent/sexual charges 18-35	5.8%	-	-	-
Nonsexual-nonviolent charges				
Nonsexual-nonviolent charges18-23	12.1%	.95	.08	1.89 (.52-6.92)
No charges 18-23	6.8%	-	-	-
Nonsexual-nonviolent charges 24-29	13.9%	2.22	.13	2.53 (.72-8.86)
No charges 24-29	6.0%	-	-	-
Nonsexual-nonviolent charges 30-35	12.9%	1.25	.10	2.07 (.57-7.61)
No charges 30-35	6.7%	-	-	-
Nonsexual-nonviolent charges 36+	13.7%	3.49[+]	.16	3.22 (.89-11.61)
No charges 36+	4.7%	-	-	-
Violent/sexual charges				
Violent/sexual charges 18-23	15.8%	1.76	.11	.2.56 (.61-10.64)
No charges 18-23	6.8%	-	-	-
Violent/sexual charges 24-29	25.0%	5.06*	.19	4.83 (1.10-21.45)
No charges 24-29	6.5%	-	-	-
Violent/sexual charges 30-35	16.7%	2.05	.12	2.75 (.66-11.51)
No charges 30-35	6.8%	-	-	-
Violent/sexual charges 36+	11.9%	2.00	.12	2.46 (.68-8.83)
No charges 36+	5.2%	-	-	-

$+ p < .10$, $*p < .05$
a. Only 7.9% of the entire sample were non-Caucasian resulting in too low cell counts to conduct chi-square analysis.

Appendix 3: Kaplan Meier models of survival times (in months) for violent/sexual reoffending for Offenders age 45 and over (n=136)

	Mean Survival Time (SE) (95% CI)	Log Rank Mantel Cox X^2 (df), p-value
Nonsexual-nonviolent charges 18-35	87.35 92.65) (82.17-92.53)	2.28 (1)
No charges 18-35	104.02 (2.41) (99.30-108.75)	-
Violent/sexual charges 18-35	85.65 (3.81) (78.19-93.11)	4.01 (1)*
No charges 18-35	103.64 (2.13) (99.47-107.81)	-
Nonsexual-nonviolent charges 18-23	87.49 (3.99) (79.67-95.31)	1.26 (1)
No charges 18-23	102.48 (2.25) (97.88-107.08)	-
Nonsexual-nonviolent charges 24-29	87.22 (3.40) (80.46-93.89)	1.82 (1)
No charges 24-29	102.85 (2.40) (98.16-107.55)	-
Nonsexual-nonviolent charges 30-35	85.19 (3.37) (79.59-91.79)	1.60 (1)
No charges 30-35	99.25 (4.06) (91.29-107.21)	-
Nonsexual-nonviolent charges 36+	87.41 (3.87) (85.25-100.52)	12.85 (1)+
No charges 36+	92.94 (3.87) (85.35-100.52)	-
Violent/sexual charges 18-23	86.58 (5.43) (75.94-97.32)	1.82 (1)
No charges 18-23	102.41 (2.24) (98.02-106.80)	-
Violent/sexual charges 24-29	78.13 (6.44) (65.50-90.75)	7.75 (1)**
No charges 24-29	100.14 (3.35) (65.50-90.75)	-
Violent/sexual charges 30-35	79.46 (3.58) (72.44-86.47)	5.88 (1)*
No charges 30-35	100.43 (3.38) (93..81-107.06)	-
Violent/sexual charges 36+	86.78 (2.90) (81.09-92.47)	3.45 (1)+
No charges 36+	104.15 (2.32) (99.61-108.69)	-

+p < .10, *p < .05, **p < .01

Appendix 4: Cox regression models comparing the impact of prior nonsexual-nonviolent charges predicting violent/sexual reoffending controlling for covariates for offenders age 45 and over (n=136)

	Model 1	Model 2	Model 3	Model 4	Model 5
	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)
Prior NSNV Charges					
18-23	1.50 (.40-5.61)	-	-	-	-
24-29	-	2.16 (.61-7.62)	-	-	-
30-35	-	-	1.39 (.35-5.59)	-	-
36+	-	-	-	2.79 (.79-9.87)	-
18-35	-	-	-	-	1.64 (.41-6.61)
-2 Log ML	68.01	67.77	68.95	66.49	68.67
X^2 (df), p-value	13.62 (5)*	14.22 (5)*	14.29 (5)*	15.74 (5)**	13.75 (5)*
R^2	.12	.12	.11	.13	.11

*p < .05, **p < .01

Note that all models were run controlling for social assistance, civil status, educational achievement and offender age at release.

Note: NSNS = nonsexual-nonviolent

Appendix 5: Cox regression models comparing the impact of prior violent/sexual charges predicting violent/sexual reoffending controlling for covariates for offenders age 45 and over (n=136)

	Model 1	Model 2	Model 3	Model 4	Model 5
	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)	Odds (95% CI)
Prior Violent/Sexual Charges					
18-23	1.54 (.35-6.83)	-	-	-	-
24-29	-	2.55 (.59-11.09)	-	-	-
30-35	-	-	1.56 (.32-7.67)	-	-
36+	-	-	-	2.72 (.72-10.30)	-
18-35	-	-	-	-	1.62 (.38-6.97)
-2 Log ML	68.86	67.75	68.88	66.87	68.74
X^2 (*df*), *p*-value	13.92 (5)*	17.87 (5)**	16.07 (5)**	14.95 (5)*	14.51 (5)*
R^2	.11	.12	.11	.12	.11

*p < .05, **p < .01

Note that all models were run controlling for social assistance, civil status, educational achievement and offender age at release.

Appendix 6: Cox regression models comparing the impact of prior nonsexual-nonviolent charges predicting violent/sexual reoffending for offenders age 45 and over (n=136)

	Model 1 Odds (95% CI)	Model 2 Odds (95% CI)	Model 3 Odds (95% CI)	Model 4 Odds (95% CI)	Model 5 Odds (95% CI)	Model 6 Odds (95% CI)
Social Assistance	3.47 (.93-12.90)[+]	2.56 (.60-10.95)	2.36 (.53-10.44)	2.16 (.48-9.76)	2.14 (.47-9.74)	2.02 (.47-8.75)
Civil Status	10.49 (1.30-84)*	9.15 (1.12-74.44)*	9.21 (1.13-74.81)*	8.81 (1.07-72.54)*	8.66 (1.01-74.25)*	7.78 (.92-66.01)[+]
Education	9.27 (1.04-82.65)*	8.29 (.92-75.07)[+]	9.06 (.94-86.84)[+]	6.94 (.73-66.21)[+]	6.91 (.72-65.91)[+]	8.66 (.77-96.90)[+]
Age at Release	-	.95 (.85-1.07)	.96 (.85-1.08)	.96 (.85-1.08)	.96 (.85-1.09)	.95 (.84-1.08)
Prior NSNV Charges						
18-23	-	-	1.54 (.35-6.83)	.97 (.17-5.66)	.97 (.17-5.72)	.74 (.12-4.75)
24-29	-	-	-	2.59 (.47-14.17)	2.51 (.40-15.84)	1.91 (.27-13.63)
30-35	-	-	-	-	1.08 (.19-6.21)	1.06 (.17-6.43)
36+	-	-	-	-	-	2.43 (.55-10.66)
-2 Log ML	69.84	69.16	68.86	67.75	67.74	66.34
X^2 (df), p-value	12.04 (3)**	13.57 (4)**	13.92 (5)*	17.91 (6)**	18.56 (7)*	16.46 (8)*
R^2	.11	.11	.11	.12	.12	.13

[+]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$

Note: NSNS = nonsexual-nonviolent

Appendix 7: Cox regression models comparing the impact of prior violent/sexual charges predicting violent/sexual reoffending for offenders age 45 and over (n=136)

	Model 1 Odds (95% CI)	Model 2 Odds (95% CI)	Model 3 Odds (95% CI)	Model 4 Odds (95% CI)	Model 5 Odds (95% CI)	Model 6 Odds (95% CI)
Social Assistance	3.47 (.93-12.90)[+]	2.56 (.60-10.95)	2.36 (.53-10.44)	2.16 (.48-9.76)	2.14 (.47-9.74)	2.02 (.47-8.75)
Civil Status	10.49 (1.30-84.63)*	9.15 (1.12-74.44)*	9.21 (1.13-74.81)*	8.81 (1.07-72.54)*	8.66 (1.01-74.25)*	7.78 (.92-66.01)[+]
Education	9.27 (1.04-82.65)	8.29 (.92-75.07)[+]	9.06 (.94-86.84)[+]	6.94 (.73-66.21)[+]	6.91 (.72-65.91)[+]	8.66 (.77-96.90)[+]
Age at Release	-	.95 (.85-1.07)	.96 (.85-1.08)	.96 (.85-1.08)	.96 (.85-1.09)	.95 (.84-1.08)
Prior violent/sexual charges						
18-23	-	-	1.54 (.35-6.83)	.97 (.17-5.66)	.97 (.17-5.72)	.74 (.12-4.75)
24-29	-	-	-	2.59 (.47-14.17)	2.51 (.40-15.84)	1.91 (.27-13.63)
30-35	-	-	-	-	1.08 (.19-6.21)	1.06 (.17-6.43)
36+	-	-	-	-	-	2.43 (.55-10.66)
-2 Log ML	69.84	69.16	68.86	67.75	67.74	66.34
X^2 (df), p-value	12.04 (3)**	13.57 (4)**	13.92 (5)*	17.91 (6)**	18.56 (7)*	19.46 (8)*
R^2	.11	.11	.11	.12	.12	.13

[+]$p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$