

Age, Actuarial Risk, and Long-Term Recidivism in a National Sample of Sex Offenders

Sexual Abuse: A Journal of
Research and Treatment
2014, Vol. 26(5) 406–428
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DOI: 10.1177/1079063213492340
sax.sagepub.com



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Abstract

Age at release has become an increasing focus of study with regard to evaluating risk in the sex offender population and has been repeatedly shown to be an important component of the risk assessment equation. This study constitutes an extension of a study of sex offender outcomes prepared for the Evaluation Branch, Correctional Service of Canada. The entire cohort of 2,401 male federally incarcerated sexual offenders who reached their warrant expiry date (WED) within 1997/1998, 1998/1999, and 1999/2000 fiscal years were reviewed for the study. Sexual and violent reconviction information was obtained from CPIC criminal records over an average of 12.0 years ($SD = 1.7$) follow-up. This study focused upon the cohort of sex offenders who were 50 years or older at time of release ($N = 542$). They were stratified according to risk using a brief actuarial scale (BARS) comprising six binary variables. For the most part, older offenders showed low base rates of sexual recidivism regardless of the risk band into which they fell. The exception was a small group of elderly offenders ($n = 20$) who fell into the highest risk band, and who showed high levels of sexual recidivism. The results of this combination of cross-sectional and longitudinal analyses of elderly sexual offenders may have important implications for offender management, particularly in light of the increasing numbers of offenders in Canada who fall into the over 50 age cohort.

Keywords

aging, sex offender, actuarial, risk, recidivism

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The realization that expectations for human performance and capabilities in a variety of areas change as a result of age is not new (Lezak, Howison, & Loring, 2004). For example, cortical atrophy is often found in males beginning in their 40s. Cerebral blood flow tends to show a decline in the early adult years and other degenerative brain changes occur among normally ageing adults (Lezak et al., 2004). It is for this reason, that norms for medical and psychological tests are adjusted according to the age of the individual being assessed (cf. Wechsler, 2008). Age-related reductions in male sexual behavior are also well documented (e.g., Rowland, Greenleaf, Dorfman, & Davidson, 1993). In this article, we will examine whether similar modifications for age-related outcomes for criminal behavior, specifically in the area of sexual offending, are justified.

Age-Related Changes in Criminal Behavior

Evidence is mounting which indicates that age at release is a variable of enough importance to justify its inclusion in the risk -assessment equation. For example, in a study of psychopaths, Harpur and Hare (1994) reported that the personality characteristics associated with Factor 1, as measured by the PCL, tended to persist across the life course, but, the degree of social deviance associated with Factor 2, was shown to decline with age, as did the symptoms of Antisocial Personality Disorder.

One of the most important papers addressing the subject of criminal desistance as a function of age was authored by Sampson and Laub (2003). Five hundred delinquent or “at risk” boys, were followed from the age of 7 to 70 in order to determine if there was an offender group whose rates of crime remained constant, regardless of increasing age and accounting for subject mortality in assessing outcomes. Sampson and Laub (2003) described the criminal careers of their subjects in the following manner: “There is a sharp increase, peaking in adolescence followed by a less sharp decline through middle adulthood, with eventual disappearance in the sixties” (p. 565). The distribution of violent crimes was found to be rather skewed, occurring largely in the earlier years and becoming relatively infrequent as offenders aged. The authors concluded that “Ageing out of crime is thus the norm—even the most serious delinquents desist” (p. 569). Further, they could find no evidence that the presence of the then commonly recognized criminogenic factors necessarily identified the individuals who continued to offend at high rates throughout their lives. They found almost no crime beyond the age of 60 regardless of the severity of their prior criminal records.

Although Sampson and Laub (2003) did identify a small group of offenders who were considered to be high rate or “chronics,” these individuals also showed the desistance phenomenon with increasing age. For violent crime, their criminal careers peaked in their mid-30s and dropped to near zero by 61. Sampson and Laub (2003) concluded, “These 500 men generated some 10,000 criminal and deviant offenses to age 70, and yet we have failed to find convincing evidence that a life-course-persistent group can be prospectively or even retrospectively identified based on theoretical risk factors at the individual level in childhood and adolescence” (p. 588). Admittedly, significant progress has been made in the area of criminal risk assessment technologies, and in the development of risk assessment tools, but their predictive accuracies

over the long-term, are all quite similar and are moderate at best (Yang, Wong, & Coid, 2010). Recently, researchers have turned to the examination of ageing and its relationship to risk for sexual crimes. Robust negative correlations between increasing offender age and recidivism have been reported with respect to various outcomes, including sexual recidivism (Hanson & Bussière, 1998).

Ageing and Recidivism in Sex Offenders

Hanson and Bussière (1998) documented the effect of ageing in their meta-analysis of sex offender recidivism predictors, finding age at release to be significantly negatively correlated with sexual recidivism ($r_w = -0.13$) across 21 studies and 6,969 offenders. In a follow-up study, Hanson (2002) examined the age-recidivism relationship among rapists and intrafamilial and extrafamilial child molesters across 10 original databases in a combined sample of 4,673 offenders. Although all three offender groups showed lower rates of sexual recidivism at older ages, extrafamilial child molesters showed relatively little decline in sexual offending until after age 50. It appears that those offenders who were primarily sexually deviant (e.g., pedophiles) were the most persistent. Hanson (2002) opined that a combination of reduced sex drive, improved self-control, and decreased offending opportunities may have contributed to the lower rates of sexual recidivism among ageing offenders. In a follow-up study examining risk factors impacting sexual recidivism base rates in a sample of 4,724 sex offenders, Harris and Hanson (2004) found that offenders under age 50 at release showed sexual recidivism rates (26%, after a 15-year follow-up) which were more than twice that of offenders who were age 50 and older (12%).

In a two-part study, Barbaree, Blanchard, and Langton (2003) assessed 1,431 subjects employing the volumetric phallometric method. The results of Study 1 showed that penile response appeared to decline from adolescence to about age 30 and then continued but at a lower rate. Study Two examined the effects of age on sex offender recidivism. Subjects were categorized as to whether they were rapists, extrafamilial child molesters, intrafamilial or incest offenders, and mixed offenders (men who assaulted both adult females and children). Recidivism rates were shown to decrease in a linear fashion with age at release.

In a follow-up study to the one described above, Blanchard and Barbaree (2005) studied 2,028 patients referred to Toronto's Centre for Addiction and Mental Health for evaluation of either sexual aggression or some other form of disturbing sexual behavior, from 1995 to 2004. These individuals were grouped according to whether they were pedophiles, hebephiles, or teleophiles (men who preferred adult victims). The responses for all three groups, as a function of age, were highly similar. Fazel, Sjöstedt, Långström, and Grann (2006) studied 1,303 sexual offenders released from Swedish prisons between 1993 and 1997. They were followed for approximately 9 years. Fewer offenders over the age of 55 years upon release reoffended sexually. Their rate of reoffense was 6.1% compared with the rate of 10.7% for those aged under 25. Prentky and Lee (2007), Thornton (2006), and Skelton and Vess (2008) all reported similar inverse relationships between age at release and sexual recidivism.

While the inverse relationship between age and sexual recidivism has received increased attention, how age-related information should be incorporated into the risk assessment equation has been the focus of substantial debate. Most actuarial risk assessment tools and assessment guides incorporate an age variable of some sort into their collection of items which emphasize the contribution to risk associated with young age. These include the Static-99, (Hanson & Thornton, 1999), Static-2002 (Hanson & Thornton, 2003), Sex Offender Risk Appraisal Guide (SORAG; Quinsey, Rice, & Harris, 1995) and others. Generally, the age item is weighted in a way so that younger offenders receive more points which reflects increased risk. In the recent revision of the Static-99 (Helmus, Thornton, Hanson, & Babchishin, 2012), older offenders also receive point deductions to reflect their decreasing risk as a result of increasing age.

Some researchers have argued that actuarial appraisals of risk assessment scales for older offenders should be statistically adjusted in order to improve their predictive accuracy. For instance, Barbaree, Langton, and Blanchard (2007) examined the contribution of age at release in a sample of 468 sexual offenders who participated in either assessment or treatment at the Warkworth Penitentiary between 1989 and 1996 and who were rated on the VRAG and the SORAG. Barbaree et al. (2007) statistically corrected the original test scores and produced an "age-corrected" version. Although the original AUC values were higher than the age corrected values, the authors reported that the addition of age at release information produced significantly higher AUC values for both scales. On the basis of their results, Barbaree et al. (2007) stated that "At present, these instruments will overestimate risk for the older offender while at the same time they may underestimate risk for younger offenders" and that "Clinical and forensic uses of actuarial instruments have not made allowances for maturational changes in risk. The result has been that estimates for risk in the older offender, based on empirical studies of younger offenders, have been exaggerated." (p. 44).

Barbaree, Langton, Blanchard, and Boer (2008) examined the contribution of age at release on the sample described in the paragraph above, but who were rated on the SVR-20. As was the case in the Barbaree et al. (2007) study, incorporating age at release information significantly increased the AUC value in terms of the SVR-20's ability to predict violence among sexual offenders. Consistent with Barbaree et al. (2007), the authors opined that actuarial instruments discriminate against elderly offenders and adjustments should be made in order to prevent inaccurate and unfair estimates of their risk to reoffend. This may be a particularly critical concern in cases where indeterminate sentences are being considered. For example, Nicholaichuk, Olver, Gu, and Takahashi (2013) found that the probability of any sort of release from custody in Canada, subsequent to the imposition of an indeterminate sentence was extremely low regardless of any objective assessment of the offender's risk.

Barbaree, Langton, Blanchard, and Cantor (2009) further examined the predictive accuracy of age corrected subscales derived from a factor analysis of well-known risk instruments. Barbaree et al. (2009) found that the predictive accuracy of the sexual deviance risk-need domain was diminished by increasing age, while the antisocial domain was inflated. It was found that combining subscales, corrected for age at release, maximized predictive accuracy. Others, however, have argued that actuarial

appraisals are too accurate to be modified by age-related adjustments. For example, Harris and Rice (2007) found that historical age-related risk variables, such as age at first sexual offense (or any first offense), were stronger predictors of subsequent recidivism than more proximal variables such as age at release; the implication being that a pattern of persistent antisociality has a greater bearing on risk than ageing. They also argued that studies of ageing and sexual recidivism were cross-sectional in nature and the observed lower recidivism rates were due to differences in preexisting risk, with older offenders constituting a lower risk group with younger offenders being, on the whole, at greater risk to reoffend.

Lussier and Healy (2009) examined the role of age at release in a sample of 553 sexual offenders who were released from Canadian Penitentiaries between April 1994 and June 2000 and followed for approximately 4.5 years. Their findings were similar to those reported above, in that older offenders reoffended at lower rates, and that ageing had a significant effect upon desistance. Finally, Wollert, Cramer, Waggoner, Skelton, and Vess (2010) also emphasized the importance of stratifying sex offender risk by age. Based upon data from 9,305 sexual offenders they reported results similar to the studies reported above in that there appears to be an inverse relationship between increasing age and risk. In addition, they described an algorithm from which age-stratified actuarial tables could be developed and predictive accuracy improved.

Present Study

The study described below was designed to address some of the issues and criticisms reported above in the sex offender ageing literature. First, subjects were identified prior to 2000 and then stratified according to preexisting actuarial risk at the time of their release. Second, the methodology incorporated both cross-sectional and longitudinal elements, therefore addressing the Harris and Rice (2007) criticisms regarding the limitations of solely cross-sectional studies of ageing and sexual offender recidivism. The subjects included in this study were identified and their histories were collected over a decade before the final data capture date. Finally, the primary goal of the study was to provide data with respect to the outcomes and characteristics of a cohort of offenders who were over 50 at age of release and examined the probability and severity of violent and sexual recidivism in this group.

Hypotheses

Hypothesis 1 H (1): Inverse linear relationship of age at release to sexual and violent recidivism.

Hypothesis 2 H (2): Lower rates of sexual and violent recidivism among older versus younger cohorts when stratified by risk level; that is lower rates of recidivism expected among older offenders across risk levels.

Hypothesis 3 H (3): Age at release will have incremental validity beyond criminal risk in regression analyses, and more specifically, age at first conviction and age at release will demonstrate incremental validity in the prediction of outcome.

Hypothesis 4 H (4): Inverse relationships between age at release and sexual and violent recidivism will be observed irrespective of sex offender subtype (cf. Hanson, 2002).

Hypothesis 5 H (5): Low and declining base rates of sexual and violent recidivism will be observed among older age cohorts followed prospectively over the follow-up period.

Method

Participants

This sample was drawn from of a study of sex offender outcomes (Gu, Wong, & Nicholaichuk, 2004) prepared for the Evaluation Branch, Correctional Service of Canada. Gu et al. (2004) identified the entire cohort of 2,401 federal male sex offenders who reached their warrant expiry date (WED) within the 1997/1998, 1998/1999, and 1999/2000 fiscal years. Inspection of the sample resulted in the removal of 243 cases that had either: (a) been charged with pimping as their only sex-related offense or, (b) individuals who were deceased prior to or shortly following their release. The removal of these cases reduced the total N to 2,158.

The mean age of the overall sample ($N = 2,158$) was 42.0 years ($SD = 12.3$) at release. Most of the resulting sample was White ($n = 1,505$, 69.7%), followed by self-identified Aboriginal groups ($n = 493$, 22.8%), Black ($n = 87$, 4.0%), and other ethnic descent ($n = 73$, 3.3%). In terms of marital status, 40.8% ($n = 880$) of the sample were married or equivalent, 38.0% were single ($n = 821$), 19.3% were divorced/separated ($n = 417$), 18 were widowed (0.8%), and the status of 19 was unknown (0.9%). The primary focus of this study were the outcomes of the cohort of sex offenders who were 50 years or older at time of release ($n = 542$). The mean age of this subsample at release was 59.1 years ($SD = 7.2$) and their mean age at the data capture date was 71.1 ($SD = 7.2$).

Data Collection Procedure

A detailed protocol was developed to code victim and offender demographics, offense history, and treatment variables. Data collection was completed by two trained research assistants in 2000 over a 1-year period using the Offender Management System (OMS), a national electronic database maintained by the Correctional Service of Canada (CSC) to store offender information. Details regarding the operationalization and coding of variables used for the present study are given below.

Victim Information. Victim information was taken from the Criminal Profile Report in the OMS Documentation Log. This data included victim gender, victim age, the number of adult, adolescent, and child victims, the relationship of victims to the offenders. Victim demographics were coded according to victim age, the number of adult, adolescent, and child victims, and the relationship of the victim to the offender. Victim

gender was recorded as “female,” “male,” “both,” or “unknown” and was dichotomized for analyses (i.e., male victim versus none). A child was defined as anyone under the age of 12, an adolescent was anyone between age of 13 to 18, and an adult victim was anyone over the age of 18. Victim relationships were determined using the dimension of extra- and intrafamilial relationships. An intrafamilial relationship included close and distant family members, including adopted children, foster children, family members of a common law partner, or anyone with whom marriage would be normally prohibited. An extrafamilial relationship included the friends of the offender or his child(ren), neighbors, coworkers, complete strangers, or victims who the offender had only known a very short time before assaulting them.

Offender Classification. There has been considerable heterogeneity in the operationalization of sex-offender subtypes. One of the primary dimensions for classification has been victim age with the demarcation point between a rapist versus child offender being a victim age of 14 (for female victims) or 16 (for male victims; Marshall & Barbaree, 1988; Quinsey, Rice, & Harris, 1995), or regardless of victim gender, age 15 (Porter et al., 2000) or 16 (Firestone et al., 2000). With this definitional heterogeneity in mind, in the present study, an offender was classified as a rapist if he had assaulted adult or postpubescent victims of either sex. The victim could have been a stranger or someone known to the offender. In very rare cases, an offender was classified as a rapist if he had assaulted a child; this was only if the offense was committed out of revenge against an adult family member of the victim or in the case of offenders who had an illegal, but apparently physically nonviolent sexual relationship with a postpubescent adolescent less than 14 years of age (e.g., a babysitter). Offenders who assaulted their wives were also classified as rapists. Extrafamilial child molesters had unrelated or extrafamilial child victim(s) (as defined above) while intrafamilial child molesters had intrafamilial child victims (as defined above) only. Mixed offenders were those who committed sexual offenses against both children and adults. Ordinarily, these were men who had significant substance abuse histories, were exceptionally violent, criminalized and seemingly sexually indiscriminate.

Official Sexual and Nonsexual Offending History. Offense history information was obtained from the Canadian Police Information Centre (CPIC). The offender's index offense was his first sexual conviction taken from his CPIC record subsequent to the sentence the offender was serving when he was released. The adjudicated sexual offense history (official history) included any adult and youth sexual convictions documented in the CPIC database. Prior sentencing dates included a separate sentencing occasion for any adjudicated criminal offense which occurred prior to the index offense(s). Explicitly for the purposes of the present investigation, we also extracted the dates of first conviction, nonsexual violent conviction, and sexual conviction; the earlier date of either first sexual or nonsexual violent was used to obtain the date of any first violent conviction. These data were then used to compute age at first conviction for a given offense category.

Marital Status. This variable was initially coded as: “single,” “married/common law,” “divorced/ separated,” or “widowed” and then dichotomized (i.e., never married versus married or equivalent) for analyses. The criteria used for the purposes of the marital status variable employed this study were adopted from (Hanson & Thornton, 1999).

Recidivism Data. Sexual and violent reconviction information was obtained from September 18 to November 2, 2009 from the Canadian national criminal record database, CPIC (Canadian Police Information Centre). As per Nicholaichuk, Gordon, Gu, and Wong, (2000), the statutory release date (i.e., two thirds of a federal sentence) was used as the default date of release, with the exception of 448 (20.8%) offenders released at warrant expiry and thus for whom their WED was used. The sample was followed for an average of 12.0 years ($SD = 1.7$) subsequent to their release from custody (prior to 2000). The specific details of any new offenses were only available if the offender received a sentence of over 2 years and again entered the Canadian Federal prison system. Otherwise, offense details were not available to the researchers as they were not included in any database to which we had access. Because these offenders were identified and categorized in 2000, this study represents one of the few investigations of sex offender outcomes with a longitudinal component over a relatively long-term follow-up interval.

Assessment of Actuarial Risk

A brief actuarial risk scale (BARS) was created from the information available in this data set for a treatment outcome study on this sample (Olver et al., 2013). The brief actuarial scale consisted of six binary risk variables (scored 0-1) which included Prior sex offenses, Prior sentencing dates, Male victim, Unrelated victim, Single, and Young Age (i.e., under age 35) at Release. Scoring rules for the items were informed by the criteria for the Static 99-R (cf. Helmus et al., 2012). Scores ranged from 0 to 5 with a mean of 1.87 ($SD = 1.2$). The scale significantly predicted sexual recidivism, with an area under the curve (AUC) = 0.70 (95% CI = 0.67 to 0.73); this would be interpreted to mean that there is a 70% chance that a randomly selected sexual recidivist would have a more deviant score on this scale than a randomly selected nonrecidivist. The measure also predicted violent (including sexual) recidivism, AUC = 0.69 (95% CI = 0.66 to 0.71); essentially, the greater the AUC, the more accurate the scale. This scale would therefore be comparable to other brief static actuarial risk assessment tools in predictive accuracy (cf. Hanson & Morton-Bourgon, 2009).

Data Analytic Strategy

Data analyses proceeded in several phases. The first set of analyses examined the linear relationship of age at release to subsequent sexual and violent recidivism. Five-year age bands were created to plot the trajectory of recidivism across age cohorts and correlational analyses were conducted to examine the relationship of age to sexual and violent recidivism. Using detailed CPIC and age at release information, we estimated the ages of sexual and violent recidivists to illustrate which age cohorts proportionately

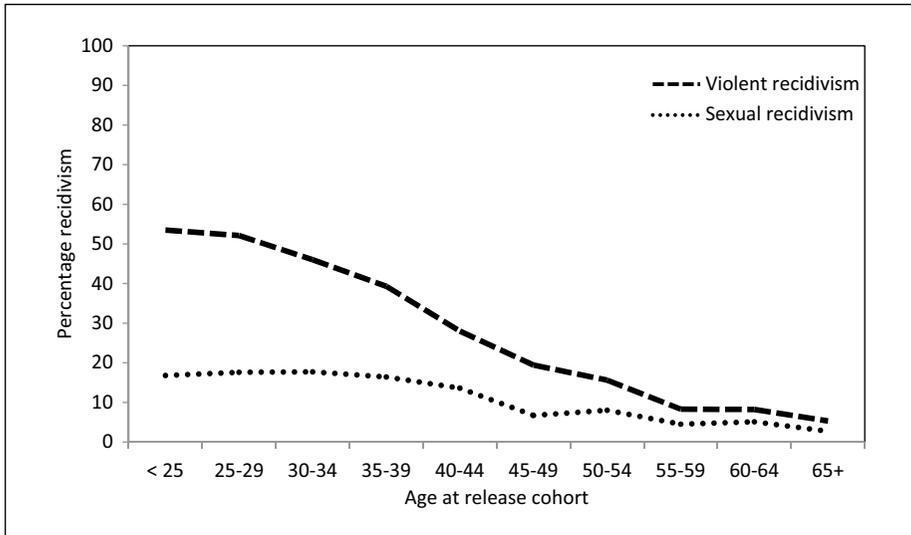


Figure 1. Base rates of violent and sexual recidivism among age at release cohorts.

Note: *n*'s for age-at-release cohorts as follows: < 25 *n* = 83; 25-29 *n* = 264; 30-34 *n* = 320; 35-39 *n* = 345; 40-44 *n* = 315; 45-49 *n* = 243; 50-54 *n* = 216; 55-59 *n* = 137; 60-64 *n* = 107; 65+ *n* = 128.

committed most of the new sexual and violent offenses. Second, we used correlational and chi square analyses to examine the relationships among age, actuarial risk, sexual and violent recidivism; that is, to what extent do older offenders (i.e., those over the age of 50) who were higher risk for reoffense, persist. As per recommendations by Wollert et al. (2010), the young age item was removed from the BARS so that different age cohorts could be evenly compared on a measure of risk without age serving as a confound. This analytic strategy was extended to include an examination of age at release, age at first conviction, and actuarial risk for sexual and violent recidivism. Cox regression survival analyses, were employed to evaluate the extent to which ageing versus lifetime antisociality, or both, contributed to the prediction of long-term recidivism. Third, data are presented which examine age and recidivism trends among specific sex-offender subtypes (as classified above) in order to determine if sexual offenders with certain victim preferences (e.g., pedophiles) showed different rates of decline as a result of age. Finally, we follow with a discriminant function analysis of the cohort of offenders over age 50 to identify what characteristics discriminate sexual recidivists (i.e., “persisters”) in this age cohort, from nonrecidivists (i.e., “nonpersisters”).

Results

Age at Release and Sexual and Violent Recidivism

Data illustrating the relationship of age at release to subsequent sexual and violent recidivism are presented in 5-year age-at-release cohorts in Figure 1. For the overall

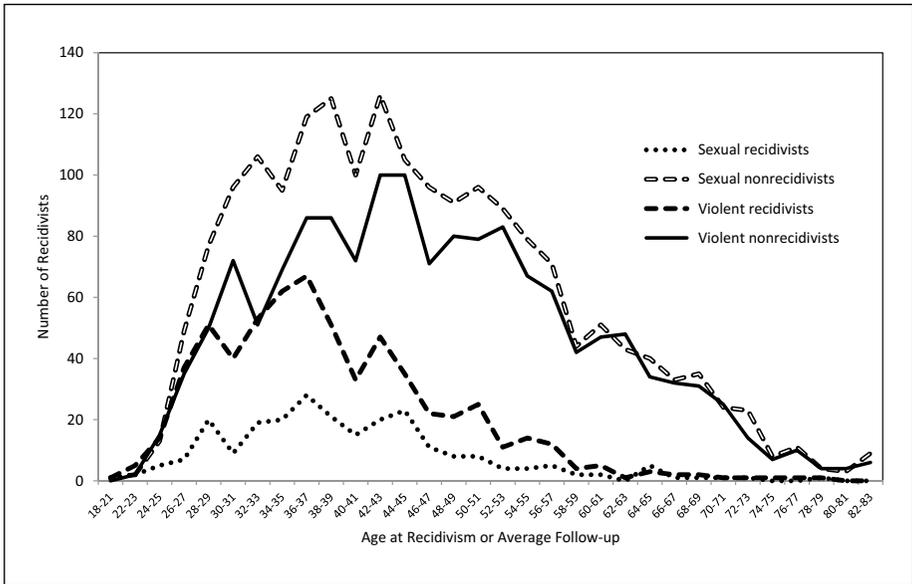


Figure 2. Offender frequencies at estimated age at time of sexual ($n = 244$) and violent ($n = 623$) recidivism (fixed 8-year follow-up) and equivalent age of sexual ($n = 1,863$) and violent ($n = 1,484$) nonrecidivists based on mean time to reconviction.

sample, the base rate of any new sexual conviction was 12.6% while the base rate for any new violent conviction was 31.6%. Lower base rates of recidivism in older age cohorts were observed for both outcomes. There was little difference between the under age 25-year and 25 to 29-year cohorts in which base rates were highest for both sexual (16.8% and 17.6%, respectively) and violent (53.5% and 52.1%, respectively) recidivism, while few differences were observed in recidivism for the 55 to 59-year, 60 to 64-year, and above 65-year cohorts. Visual inspection of the chart suggests that there was a steady decrease as a function of the offender’s age at release. The magnitude of the relationship between age at release category and recidivism, examined using Cramer’s V, was small to moderate for sexual recidivism ($V = -0.16, p < .001$), and moderate to large for violent recidivism ($V = -0.35, p < .001$).

As another means of examining the relationship of age and sexual and general violence, we estimated the age of sexual and violent recidivists as well as sexual and violent nonrecidivists. This was done for the recidivists by adding the amount of time elapsed from their release date to the next sentencing date for any violent or sexually violent offense in addition to each individual’s age at release. This would be a conservative estimate of the individual’s actual age at recidivism given the variable amount of time associated with processing by the justice system (e.g., pretrial incarceration prior to conviction) and sentencing. For the nonrecidivists, we added the mean time to sexual (3.85 years) or violent (2.89 years) to age at release for the nonrecidivists to create an equivalent age when the average recidivist reoffended. Figure 2 plots the

Table 1. Frequencies of BARS Scores (Without Age Variable) and Relationship to Sexual and Violent Recidivism Among Older (Age 50+) and Younger (Under Age 50) Offender Groups.

BARS Score and Criterion	Age 50+ at Release				Under Age 50 at Release				Age Category Recidivism Comparisons	
	Recidivists		Overall Sample		Recidivists		Overall Sample		χ^2	<i>p</i>
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%		
<i>Sexual recidivism</i>										
0	5	2.9	170	32.9	8	4.4	181	12.2	0.54	.463
1	4	2.3	171	33.1	44	8.9	497	33.6	8.09	.004
2	5	5.4	93	18.0	92	17.6	524	35.4	8.85	.003
3	7	11.1	63	12.2	51	24.8	206	13.9	5.31	.021
4+	8	40.0	20	3.9	24	32.9	73	4.9	0.35	.552
Total	29	5.6	517	100.0	219	14.8	1481	100.0	32.51	.001
<i>Violent recidivism</i>										
0	11	6.5	170	32.9	27	14.9	181	12.2	6.48	.011
1	13	7.6	171	33.1	165	33.2	497	33.6	42.65	.001
2	6	6.5	93	18.0	236	45.0	524	35.4	49.33	.001
3	14	22.2	63	12.2	95	46.1	206	13.9	11.43	.001
4+	10	50.0	20	3.9	40	54.8	73	4.9	0.15	.703
Total	54	10.4	517	100.0	563	38.0	1481	100.0	151.51	.001

Note: BARS = brief actuarial risk scale

estimated numbers of individuals who sexually or violently recidivated, as well as nonrecidivists, at a given age group organized by 2-year intervals. A fixed 8-year follow-up was employed in creating this figure to control for differential offending opportunity. As illustrated in this figure, the vast majority of new sexual and violent offenses were committed by released offenders who were in their mid- to late-30s, with spikes observed in the 28 to 29-year cohort, and the 42 to 43-year cohort. In the present sample, there were exceptionally few sexual or violent recidivists beyond age 60 and almost none aged 70 or older.

Age, Actuarial Risk, and Recidivism

Consistent with the literature cited above, older offenders tended to be lower risk than younger offenders, not only as evinced by lower recidivism rates, but also by the distribution of actuarial risk scores. Sufficient information was available to score the BARS (no missing items) for 1,998 offenders. The distribution of risk scores for older (age 50 and up, $n = 517$) versus younger (under age 50, $n = 1,481$) offenders is presented in Table 1. Two thirds (66%) of older offenders scored quite low (0 or 1) on the BARS in contrast to 45.8% of the younger offenders. Age at release was significantly negatively correlated with dimensional risk score ($r = -0.21, p < .001$).

The next set of analyses examined base rates of sexual and violent recidivism among the older and younger offenders at different levels of risk. Table 1 also provides base rates of sexual and violent recidivism increased with each successive increase in risk score for both age groups, particularly the highest risk (i.e., score 4+) group. The BARS significantly predicted sexual and violent recidivism among both older (AUC = 0.73, 95% CI = 0.61-0.84 and AUC = 0.67, 95% CI = 0.58-0.76, respectively) and younger (AUC = 0.66, 95% CI = 0.63-.70; AUC = 0.65, 95% CI = 0.62-0.67, respectively) offenders. The base rates of sexual and violent recidivism tended to be lower for older offenders across most scores. Differences between groups in rates of sexual recidivism attained significance at scores of 1, 2, and 3 but not at the lower (0) or upper (4+) extremes. For violent recidivism, younger offenders had significantly higher base rates of this outcome than older offenders across the 0 to 3 risk categories, but not the highest risk cohort. Although it is noteworthy that there were no significant differences in base rates of sexual or violent recidivism between the two age groups in the highest risk cohort, this comparison must be contextualized by the small n in the high risk over 50 groups as well as the unique characteristics of the persisters, as discussed below.

Age at First Conviction Versus Age at Release and Recidivism

We next examined the relationship of indicators of aging to sexual and violent recidivism, controlling for two key measures of antisociality; Age at First Conviction (or sexual conviction) and BARS score minus age. Table 2 is a variable correlation matrix of these predictors and the two outcomes. Also included is Time Incarcerated for Index Sentence, computed by subtracting age at index from age at release. As seen here, the age variables were very highly intercorrelated, indicating considerable collinearity (cf. Harris & Rice, 2007). All predictor variables were significantly correlated with both outcomes. Time Incarcerated was also significantly positively correlated with outcome, as well as with BARS score, suggesting this to be a somewhat weaker proxy of risk or possibly offense severity, as opposed to a measure of aging.

As it was evident that Age at Release was a more appropriate operationalization of possible aging than Time Incarcerated in this sample, we conducted a set of Cox regression survival analyses to examine the relationship of age at release to recidivism, controlling for age at first conviction and actuarial risk. As noted above, both historical age variables (Age at First Conviction and Age at First Sexual Conviction) were strong and significant predictors of sexual and violent recidivism.¹ The first set of analyses examined the incremental prediction of sexual and violent recidivism through entering BARS score (minus age) in the first step, followed by Age at First Conviction in the second step, and Age at Release in the third and final step. As seen in Table 3, BARS (minus age) and Age at First Conviction were consistently highly significant predictors of sexual and violent recidivism. In the third and final block, Age at Release added significantly to the prediction of both sexual ($\Delta\chi^2 [1, N = 1,969] = 5.05, p = .025$) and violent ($\Delta\chi^2 [1, N = 1,970] = 34.09, p < .001$) recidivism in the expected direction and consistent with univariate results reported above.

Table 2. Variable Intercorrelations.

Measure	1	2	3	4	5	6	7
1. Age at release		.74	.87	.00	-.21	-.15	-.33
2. Age first conviction			.80	-.18	-.35	-.17	-.35
3. Age first sexual conviction				-.19	-.43	-.22	-.35
4. Time incarcerated for index sentence					.15	.05*	.11
5. BARS score (no age)						.23	.24
6. Sexual recidivism							.56
7. Violent recidivism							
Mean (SD) or %	41.93 (12.32)	28.99 (14.46)	36.12 (12.95)	3.28 (2.02)	1.54 (1.07)	.13	.31

Note: BARS = brief actuarial risk scale. Listwise $N = 1,968$. All correlations $p < .001$ except for * $p = .027$

These analyses were repeated in the same order as above, this time substituting Age at First Sexual Conviction, and entering it in the second block, followed by Age at Release in the third block (Table 4). As in the previous analyses, both BARS (minus age) and Age at First Sexual Conviction were highly significant predictors of both recidivism outcomes. Age at Release, however, added incrementally to the prediction of violent ($\Delta\chi^2 [1, N = 1,969] = 18.72, p < .001$) but not sexual ($\Delta\chi^2 [1, N = 1968] = 0.03, p = .873$) recidivism. In short, after controlling for early onset of criminality and actuarial risk, Age at Release was associated with significant decreases in the probability of general violence. Age at Release did not consistently add to the prediction of sexual violence, specifically when controlling for Age at First Sexual Conviction; we propose an explanation for this finding later in this article.

Age and Recidivism Among Specific Sex Offender Subtypes

The age-recidivism link was further examined among specific sex offender subtypes, classified according to their victim type. Table 5 provides a summary of key age variables (age at release, estimated age at sexual and violent recidivism), base rates of recidivism, and the relationship of age at release to outcome among the sex offender subtypes. There was a sample for whom sufficient victim information was not available to classify them, and as such, we included these cases in the table for comparison purposes only. The rapists tended to be the youngest offender group, both at release

Table 3. Cox Regression Survival Analysis: Incremental Validity of Actuarial Risk, Age at First Conviction, and Age at Release in the Prediction of Sexual and Violent Recidivism.

Variable Combination	B	SE	Wald	p	e ^B	95% CI	
						Lower	Upper
<i>Sexual recidivism (N = 1,969)</i>							
Block 1							
BARS (age removed)	.580	.056	107.25	.001	1.786	1.600	1.993
Block 2							
BARS (age removed)	.486	.059	67.86	.001	1.626	1.449	1.826
Age at first conviction	-.042	.008	30.15	.001	.959	.944	.973
Block 3							
BARS (age removed)	.502	.060	69.88	.001	1.652	1.469	1.859
Age at first conviction	-.032	.009	12.43	.001	.968	.951	.986
Age at release	-.017	.008	4.86	.028	.984	.969	.998
<i>Violent recidivism (N = 1,970)</i>							
Block 1							
BARS (age removed)	.393	.036	122.34	.001	1.481	1.381	1.588
Block 2							
BARS (age removed)	.238	.038	38.94	.001	1.268	1.177	1.366
Age at first conviction	-.075	.006	161.52	.001	.928	.917	.939
Block 3							
BARS (age removed)	.249	.039	40.80	.001	1.282	1.188	1.384
Age at first conviction	-.060	.007	85.66	.001	.941	.929	.953
Age at release	-.027	.005	32.17	.001	.974	.965	.983

Notes: BARS = brief actuarial risk scale.

and at age at recidivism, and were significantly younger than the extrafamilial child molesters, intrafamilial (incest), and mixed offender groups. In contrast, the intrafamilial (incest) child molesters tended to be the oldest offenders overall. Second, it is worth noting that base rates of sexual recidivism were not significantly different between the rapists, extrafamilial child molesters, or mixed offenders (base rates ranging from roughly 13% to 15%), but this was significantly higher than the intrafamilial (incest) group. Rapists (and the unclassified group) also had the highest rates of general violent recidivism, followed by the extrafamilial child molesters and mixed offenders. Finally, age at release was significantly negatively correlated with lower rates of sexual and violent recidivism among each sex offender type, with the exception of the smaller unclassified group.

Who Were the Persistent Sex Offenders?

The aforementioned analyses presented data which showed a pattern of decreased sexual and violent recidivism associated with increased offender age, with very few

Table 4. Cox Regression Survival Analysis: Incremental Validity of Actuarial Risk, Age at First Sexual Conviction, and Age at Release in the Prediction of Sexual and Violent Recidivism.

Variable Combination	B	SE	Wald	p	e ^b	95% CI	
						Lower	Upper
<i>Sexual recidivism (N = 1,968)</i>							
Block 1							
BARS (age removed)	.580	.056	107.26	.001	1.786	1.600	1.993
Block 2							
BARS (age removed)	.410	.062	43.16	.001	1.507	1.334	1.704
Age at first sexual conviction	-.049	.007	44.22	.001	.952	.939	.966
Block 3							
BARS (age removed)	.406	.067	36.49	.001	1.501	1.316	1.713
Age at first sexual conviction	-.050	.010	22.98	.001	.951	.932	.971
Age at release	.001	.009	0.03	.873	1.001	.984	1.019
<i>Violent recidivism (N = 1,969)</i>							
Block 1							
BARS (age removed)	.393	.036	122.34	.001	1.481	1.381	1.588
Block 2							
BARS (age removed)	.165	.041	16.42	.001	1.179	1.089	1.277
Age at first sexual conviction	-.059	.005	161.40	.001	.943	.934	.952
Block 3							
BARS (age removed)	.236	.044	28.90	.001	1.266	1.162	1.380
Age at first sexual conviction	-.035	.008	22.05	.001	.965	.951	.980
Age at release	-.027	.007	16.66	.001	.973	.960	.986

acts of sexual and violent recidivism occurring in the oldest offender groups overall. Actuarial risk, is relevant as demonstrated by strong predictive accuracy of our brief actuarial tool among offenders over age 50, and there were comparable sexual and violent recidivism rates in the most extreme risk cohort as with a broad group of younger offenders (under age 50 at release). So who were the persistent sex offenders? In our final analysis, persistent sex offenders (i.e., individuals over age 50 who committed a new sexual offense) were compared against nonpersisters (i.e., individuals over age 50 at release who did not sexually reoffend). Twenty nine persisters for whom such comparisons could be drawn, were identified with one case excluded owing to insufficient information. The two groups were compared on the individual risk variables used to create the brief actuarial scale (with the exception of age at release) as well as whether the individual had any child or adolescent victims (*N* cases with complete data, including the additional variable, for these analyses = 511). As reported in Table 6, in contrast to nonpersistent sex offenders, persisters were more likely to have a male victim, official sex offense history, four or more prior sentencing dates, and were single. Very few offenders in either group had exclusively adult

Table 5. Comparisons of Age Variables and the Relationship of Age at Release to Outcome Among Sex Offender Subtypes.

Sex Offender Group	Sexual recidivism						Violent recidivism														
	Age at Release			Age at Recidivism			BR			Age at Release and Recidivism			BR			Age at Release and Recidivism					
	<i>n</i>	<i>M (SD)</i>		<i>n</i>	<i>M (SD)</i>		%	<i>n</i>	<i>M (SD)</i>		%	<i>n</i>	<i>M (SD)</i>		%	<i>n</i>	<i>M (SD)</i>		%	<i>r_{pb}</i>	
Rapist	937	36.7 (9.7)		144	38.7 (8.9)		15.4 ^d	403	37.9 (8.7)		43.0 ^{c,d,e}	403	37.9 (8.7)		43.0 ^{c,d,e}	403	37.9 (8.7)		43.0 ^{c,d,e}	-0.09 ^{***}	-0.23 ^{***}
Intrafamilial child molester	571	48.4 (12.5) ^{a,b,c,e}		35	46.7 (11.5) ^{ab}		6.1	80	46.3 (11.6) ^{a,b,c}		14.0	80	46.3 (11.6) ^{a,b,c}		14.0	80	46.3 (11.6) ^{a,b,c}		14.0	-0.14 ^{***}	-0.23 ^{***}
Extrafamilial child molester	257	44.7 (12.7) ^{ab}		34	43.3 (10.5)		13.2 ^d	71	41.6 (9.7)		27.6 ^d	71	41.6 (9.7)		27.6 ^d	71	41.6 (9.7)		27.6 ^d	-0.20 ^{***}	-0.38 ^{***}
Mixed offender	274	45.6 (12.3) ^{ab}		40	45.4 (11.6) ^a		14.6 ^d	80	43.2 (11.7) ^{ab}		29.2 ^d	80	43.2 (11.7) ^{ab}		29.2 ^d	80	43.2 (11.7) ^{ab}		29.2 ^d	-0.16 ^{***}	-0.35 ^{***}
Unknown/other	119	38.8 (9.8)		18	40.0 (8.0)		15.1 ^d	48	38.7 (7.6)		40.3 ^{c,d,e}	48	38.7 (7.6)		40.3 ^{c,d,e}	48	38.7 (7.6)		40.3 ^{c,d,e}	-0.12	-0.33 ^{***}
Total sample	2,158	42.0 (12.5)		271	41.4 (10.3)		12.6	682	39.9 (9.9)		31.6	682	39.9 (9.9)		31.6	682	39.9 (9.9)		31.6	-0.16 ^{***}	-0.34 ^{***}

Note: BR = base rate

^asignificantly different from rapists

^bsignificantly different from unknown/other group

^csignificantly different from extrafamilial child molesters

^dsignificantly different from intrafamilial child molesters

^esignificantly different from mixed offender

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

Table 6. Characteristics of Persistent Sex Offenders.

Variable	Persisters <i>n</i> = 29	Nonpersisters <i>n</i> = 482	χ^2	<i>P</i>
Male victim	41.4	21.6	6.11	.013
Teen or child victim	86.2	93.4	2.14	.144
Unrelated victim	65.5	50.4	2.50	.114
Prior sex offense	72.4	22.4	36.25	.000
4 + sentencing dates	17.2	1.7	26.79	.000
Single	34.5	18.3	4.65	.031

victims. A discriminant function analysis (using the Enter Method) employing these six variables correctly classified 77.1% of persistent and nonpersistent older sex offenders. Significant independent predictors were the same four variables that differentiated the two groups in univariate analyses. In essence, the more persistent offenders tended to possess characteristics consistent with sexual deviance rather than violent criminality.

Twenty men over the age of 50 fell into the highest risk band (4). Of this number, eight reoffended sexually. Their histories were consistent with description of the persisters given above in that the majority had child victims (often male). Two also had histories of assaulting adult women. Sentence length has been shown to be related to the degree of violence associated with the offense (Nicholaichuk et al., 2000; Olver, Nicholaichuk, Gu, & Wong, 2013). With one exception, the sentences these men received for their new sexual offenses ranged from 9 to 28 months (mean = 17.7 months) this reflected a pattern of a relatively low level of violence associated with these offenses (e.g., Invitation to Sexual Touching). The one exception to this pattern was an offender with a history of assaulting underage female children who was sentenced, at the age of 52, for the Aggravated Sexual Assault of an adolescent female. Thus it appears that not only did the rate of reoffending decrease with age but, in most cases, so did the degree of violence. These findings are clearly consistent with those of Fazel et al. (2006) and (Nicholaichuk et al., 2000).

Discussion

The present investigation examined the relationship of age to sexual and violent recidivism in a large Canadian cohort of sex offenders who were rated on several predictor variables and followed up for an average of 12 years prospectively post release. Broadly consistent with the extant literature (Hanson, 2002; Sampson & Laub, 2003), age at release showed an inverse relationship to the probability of sexual and/or violent recidivism. Rates of sexual and violent recidivism seemed to decline at older age cohorts with very low rates of recidivism observed in older offender groups overall. These findings are also consistent with those of the studies noted above, and parallel those of Wollert et al. (2010). Further, these results in our view are consistent with

other areas of human functioning; there are important age-related changes in expectations of human behavior.

The Relationship of Aging and Risk to Sexual and Violent Recidivism

Older offenders who scored as high risk on a BARS demonstrated comparable rates of sexual and violent recidivism as a broadly younger cohort of offenders; however, only 20 (3.9%) out of 517 offenders age 50 and over scored at the highest level (i.e., 4+), which suggests this high risk older group to be a very small and select group of offenders and arguably limits the generalizability of this finding. Overall, age at release was negatively correlated with BARS score, and coupled with the lower recidivism base rates of this group, indicated that older offenders appear to be a lower risk group in general. Older and younger offender group comparisons at different risk cut offs were also illuminating. While there were no significant differences in recidivism base rates between the highest risk younger and older offenders, the highest risk older offenders were found to be rare, and within most risk categories older offenders otherwise evinced significantly lower rates of sexual and violent recidivism than younger offenders. Taken together, these results suggest that the mitigating effects of age appeared most evident in the moderate risk cohorts (e.g., scores from 1-3) in contrast to the uppermost (i.e., high risk and sexually deviant) and lowermost (i.e., lowest risk) extremes.

We further examined the relationship of an operationalization of aging, age at release, to subsequent sexual and violent recidivism while controlling for age at first conviction for various offense categories as well as risk. Age at first conviction, representing the onset of criminal activity, and one's formal contact with the justice system, can be taken to be a proxy of lifetime antisociality and was a strong predictor of outcome in the present study as was age at release. We also examined the amount of time spent incarcerated for the index sentence as a measure for the passage of time. The amount of time tended to be quite short on average (about 3 years), likely too small for any meaningful amount of risk-mitigating aging to occur in our view. Rather, time incarcerated seemed to be more of a proxy of risk given that it was positively correlated with BARS and recidivism. Time incarcerated has even been found to be positively correlated with PCL-R score (Harris & Rice, 2007) which would seem to be consistent with this notion.

A series of Cox regression analyses examined the extent to which age at release added incrementally to the prediction of outcome beyond actuarial risk and age at first conviction variables. Age at release uniquely predicted decreased violent recidivism after controlling for BARS scores and either age at first conviction or first sexual conviction. One implication of this finding is that the lower recidivism rates of older offenders may not be entirely explained by their lower overall risk (i.e., BARS score) or less enduring lifetime antisociality (i.e., later age of onset of criminality), and would be consistent with the possible risk-mitigating effects of aging. These results stand in contrast to Harris and Rice (2007), who found through logistic regression analyses that age at release did not add incrementally in the prediction of violence after controlling for age at first conviction, or other indicators of risk or persistent antisociality.

When controlling for age at first sexual conviction age at release added incrementally to the prediction of any violence, but not sexual recidivism specifically. A possible explanation we advance is that early onset of sexual offending is not only a proxy for lifetime antisociality, but enduring deviant sexual preferences (see also Thornton, 2006), which in this sample, may have been less impacted by aging and was a stronger overall predictor of future behavioral manifestations of deviance (i.e., sexual offending) than aging; for instance, as seen in the small sample of persisters, discussed below.

In sum, we conclude from these findings that both risk and aging matter; specifically, that age tends to mitigate risk overall, but clearly not all older offenders are low risk. A small proportion persisted and remained high risk. This caveat notwithstanding, it does seem clear that the degree of violence associated with the new offenses is, for the most part, comparatively low. There has been much discussion and debate about how, if at all, actuarial estimates of risk should be adjusted to account for risk-mitigating information such as increasing offender age. Although this may understandably be tempting, we offer caution about applying the present results to making such adjustments, as the present results suggest that the possible mitigating effects of age may also be moderated by risk, offender type, and the offender's social circumstances.

Persistent Sex Offenders

We attempted to identify individuals who would be characterized as persistent sex offenders through comparisons drawn between sexual recidivists and nonrecidivists who were age 50 or over at release. Twenty individuals over the age of 50 scored in the highest risk band. Eight of these individuals sexually reoffended while an additional 21 individuals at other lower risk levels on the brief actuarial tool also reoffended. Chi square and discriminant function analyses revealed that persistent offenders were more likely to have a male victim, prior sex offense history, lengthy adjudication history, and to be single. This collection of variables is indicative of sexual deviance, which includes a preference for male victims, persistent history of offending, and few romantic attachments. This pattern of variables appears to describe an individual with deviant interests that may serve to potentiate risk and prolong recidivism risk. These results are consistent with Hanson's (2002) contention that decreasing sex drive, improved self-control, and decreased access to victims may contribute to the lower sexual recidivism rates in older sex offenders. In fact, a full one third of persisters in the present sample were intrafamilial child molesters usually with male victims, suggesting quite possibly that sexual deviance, coupled with victim access may be significant indicators of persistence.

It also appears that the more criminalized violent offenders may have desisted earlier, whereas a portion of possibly nonviolent deviant individuals who were beyond the age of 50, persisted, but with relatively low levels of physical violence. For example, an examination of the sentences they received for their reconvications indicated that in all but one case in the highest risk band, they received relatively short prison terms.

Study Strengths, Limitations, and Future Directions

There are some important strengths and limitations of the present investigation. The present study has prospective elements (i.e., given the predictor variables were collected within a year of the release of the last fiscal cohort of offenders) on a large national sample of Canadian federal sex offenders followed up an average of 12 years postrelease. The size and representativeness of the sample provide some measure of confidence in the generalizability of the results to other Canadian cohorts of offenders, and possibly to other international jurisdictions. The nature of the design, in turn, provides some element of ecological validity and reduces some bias that may be inherent with the use of preselected samples in purely retrospective designs. We believe the analyses, in turn, support the dynamism of sexual violence risk, namely its mitigation to some degree with advancing age, especially among moderate risk offenders.

There are a number of limitations that are also important to acknowledge. While we had to access to comprehensive outcome data through CPIC, there are inherent limitations with this system. For one, some offenders may have had youth charges and convictions that were expunged, which would have otherwise registered earlier ages at first conviction than used in the present analyses. Under the former Young Offenders Act and the newer Youth Criminal Justice Act, such convictions can be listed (and frequently are), but this is not always necessarily the case. A related limitation is that some of the older offenders may have unknowingly died during follow-up period thereby obviously eliminating their opportunity to offend; although the death date is often registered on the CPIC (and this was recorded as the end date when it was) it is possible that this did not occur for some deceased cases.

Perhaps the most substantive weakness of the present investigation was that the outcome data were collected at one time point postrelease, and the nature of the design did not permit a more sensitive examination of potentially important age-related changes over the lifespan, as in Sampson and Laub (2003), which may be linked to desistance in criminal behavior. There were also some important cohort differences (e.g., older offenders were actuarially lower risk on average than younger offenders) and it is possible that the BARS on its own did not capture sufficient risk variance to adequately control for such differences; however, we believe this was offset by a level of predictive accuracy comparable in magnitude to other risk tools (cf. Hanson & Morton-Bourgon, 2009) suggesting that it likely did not serve as a substantially inferior means of controlling risk.

These limitations were tempered, in part, through following the offenders in real time and obtaining estimates of the ages at sexual and violent recidivism. In our view, these age-related differences observed with respect to risk and subsequent sexual violence are informative and we believe have implications for the use of actuarial risk assessment tools with older offenders. Specifically, the present results may be viewed as consistent with Wollert et al. (2010) who presented data on Static-99 supporting the notion for separate age norms for older offenders. Helmus et al. (2012) also demonstrated that weighting the Static-99R and the Static-2002R according to the offender's age was instrumental in improving the predictive validity of these scales. The findings presented above are entirely consistent with their approaches.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

Notes

1. We also examined the relationship of Age at First Nonsexual Violent Conviction and Age at First Violent (including sexual) Conviction to sexual ($r = -0.07, p = .019$ and $-.22, p < .001$) and violent ($r = -0.19, p < .001$ and $-.36, p < .001$) recidivism. We decided to utilize Age at First Conviction and Age at First Sexual Conviction for further analysis given that these seemed to be the strongest and most conceptually parsimonious predictors of outcome and representations of lifetime persistent antisociality, given that Age at First Nonsexual Violence was by comparison a weaker predictor, and Age at First Any Violence seemed redundant with Age at First Sexual Conviction, for the analyses that would follow.

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