

Does Static-99 Predict Recidivism Among Older Sexual Offenders?

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Published online: 30 November 2006
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Abstract Static-99 (Hanson & Thornton, 2000) is the most commonly used actuarial risk tool for estimating sexual offender recidivism risk. Recent research has suggested that its methods of accounting for the offenders' ages may be insufficient to capture declines in recidivism risk associated with advanced age. Using data from 8 samples (combined size of 3,425 sexual offenders), the present study found that older offenders had lower Static-99 scores than younger offenders and that Static-99 was moderately accurate in estimating relative recidivism risk in all age groups. Older offenders, however, had lower sexual recidivism rates than would be expected based on their Static-99 risk categories. Consequently, evaluators using Static-99 should consider advanced age in their overall estimate of risk.

Keywords Age · Recidivism · Risk assessment

Evaluators interested in making long-term predictions about the recidivism risk of sexual offenders often rely on actuarial tools (Association for the Treatment of Sexual Abusers, 2005; Doren, 2002). Actuarial tools specify the items to be considered and provide explicit rules for combining these items into an overall evaluation of risk. Actuarial tools are more accurate than unguided clinical judgement (Hanson, Morton, & Harris, 2003); furthermore, they improve procedural justice by articulating the basis of decisions having serious consequences for individuals.

For the assessment of sexual recidivism potential, the most commonly used actuarial risk measure is the Static-99 (Hanson & Thornton, 2000). In the 2002 Safer Society Survey (McGrath, Cumming, & Burchard, 2003), Static-99 was used in approximately half the treatment programs surveyed. The next most common measure (used in 35% of the programs) was the Rapid Risk Assessment for Sexual Offence Recidivism (RRASOR; Hanson, 1997),

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which is a subset of Static-99 items. The reason for Static-99's popularity is that it is easy to score and as accurate as other actuarial measures (Hanson & Morton-Bourgon, 2004).

The authors of Static-99, however, have never claimed that it provides a complete and comprehensive assessment of recidivism risk. Because it addresses only static, historical factors, Static-99 does not directly measure the enduring psychological traits that are presumed to motivate sexual offending (e.g., deviant sexual interests, lifestyle instability, intimacy deficits; Beech, Fisher, & Thornton, 2003; Beech & Ward, 2004). As well, other ways of defining static factors could add information not captured in Static-99 (Hanson & Thornton, 2003).

One factor worthy of further examination is advanced age. Hanson (2002b) found that the risk for sexual recidivism was lower among older offenders than among younger offenders. Fewer than 5% of the offenders over age 60 were detected committing a sexual offence compared with over 20% of offenders in their twenties. Hanson concluded that the decline was linear for rapists and curvilinear for extrafamilial child molesters, who demonstrated the highest risk of recidivism during the late twenties and early thirties. In a re-analysis of Hanson's (2002b) data, Barbaree, Blanchard, and Langton (2003) concluded that the decline was linear after the age of 25 for rapists, incest offenders, and extrafamilial child molesters.

Barbaree et al.'s (2003) linear projection indicated that the expected recidivism rate for all types of sexual offenders would decrease to virtually zero at age 70. There has been very little examination of sexual offenders over 70 because such offenders are rare. In the Static-99 development samples ($n = 1,228$; Hanson & Thornton, 2000), there were only 6 offenders over 70 at the time of release (the oldest offender was 76). In the Hanson (2002b) age study, 30 of the 4,673 offenders were over 70 at the time of release and 4 were over 80. The oldest recidivist in the Hanson (2002b) study was 72 at the time of release and reoffended sexually the following year.

It is doubtful that Static-99 captures the effect of age across the full life span. Static-99 contains one point for "Age less than 25," but no further credit is given for advanced age. Furthermore, Barbaree et al. (2003) found that considering advanced age improved the accuracy of risk prediction after RRASOR scores were considered (RRASOR contains the same item "Age less than 25" as does Static-99). As well, Hanson and Thornton (2003) recommended greater weight be given to age in Static-2002 (4 age categories; 3 points out of 14) than it had been given in Static-99 (2 categories; 1 point out of 12). To my knowledge, however, there has not been a direct test of whether advanced age contributes information to risk assessment beyond that given by Static-99 scores.

The purpose of the present study was to examine the combined effect of age and Static-99 scores on the prediction of sexual recidivism. The low recidivism rate of older offenders may be attributable to the older offender being low risk to begin with, and any age related effects may diminish or disappear when controlling for other risk factors. As well, the study addressed whether age-related reductions in recidivism rates are observed for all offenders. Two potential mediating variables were victim age (adult versus child) and initial risk. It is possible that age-related declines would be found only for low and moderate risk offenders, but not for high risk offenders (who have already demonstrated considerable persistence in sexual offending). The data used to examine these questions came from eight samples of sexual offenders, drawn from Canada, the US, and the United Kingdom (combined sample of 3,425).

Method

Static-99

Static-99 (Hanson & Thornton, 2000) is an actuarial risk tool designed to predict sexual and violent recidivism among adult male sexual offenders. It contains 10 items: Age less than 25, Never lived with a lover for two years, Any prior convictions for non-sexual violence, Any current convictions for non-sexual violence, 4 or more prior sentencing dates, Prior sexual offences, Non-contact sexual offences, Any male victims, Any unrelated victims, and Any stranger victims (see Harris, Phenix, Hanson, & Thornton, 2003 for detailed coding rules). All items are accorded one point, with the exception of “Prior sexual offences,” where up to three points can be given. Previous studies have found high levels of rater reliability ($r \approx .90$; Harris et al., 2003, p. 79), and moderate accuracy in predicting sexual recidivism risk (average d of 0.63, based on 5,103 offenders from 21 studies; Hanson & Morton-Bourgon, 2004). Risk categories are based on the following raw scores: 0–1 “Low,” 2–3 “Moderate-Low,” 4–5 “Moderate-High,” and 6–12 “High.”

Samples

An overview of the samples can be found in Table 1. Racial ethnicity was not recorded for most samples, but given the demographics of the jurisdictions from which they were selected, the offenders would be expected to be predominantly White. All offenders were adult males (18 years old or older at time of release). Five of the eight samples were included in Hanson’s (2002b) age study, three were included in Hanson and Thornton’s (2000) Static-99 study. Three samples ($N = 1,656$) were not included in either of these previous studies. Subjects were retained for analysis if data were available concerning age at release, survival time to sexual recidivism, and 7 of the 10 Static-99 items. Some of the Static-99 items were approximated from similar items available in the existing data bases. For example, the total number of prior sentencing occasions was estimated by taking the total number of prior convictions and multiplying by 2/3. This estimation was based on our prior research with Canadian criminal history records (Hanson & Thornton, 2003), in which we found that there was an average of 1.5 convictions for each sentencing occasion.

Canadian Federal – 1991 to 1994 Releases (Motiuk, 1995; see also Motiuk & Brown, 1993; Motiuk & Brown, 1996). This study followed a group of sexual offenders released by the Correctional Service of Canada (CSC) between 1991 and 1994. In Canada, CSC is responsible for all offenders serving a period of incarceration of two years or more. The offenders in this group were those who were reviewed in 1991 (see Motiuk & Porporino, 1993) while they were still incarcerated. Follow-up information was coded from 1994 RCMP records, which includes convictions from all jurisdictions in Canada. Non-contact sex offences were approximated by index convictions for exhibitionism; Sentencing occasions for anything were approximated by doubling the number of prior prison sentences.

Canadian Federal – Quebec Region (Proulx, 2004). This sample was drawn from consecutive admissions to CSC’s Regional Reception Centre in Quebec between 1995 and 2000 ($N = 477$; comprising 93% of the sexual offenders in the region). Also included were 10 sexual murders sentenced prior to 1995 who were released after 1996. Follow-up information was collected in 2004 from RCMP records. Information was available to code all Static-99 items.

Table 1 Study characteristics

Sample	Total sample size	Age (SD)	Static-99 (SD)	Child molesters (%)	Average years of follow-up	Sexual recidivism rate	Recidivism criterion
Canadian Federal – 1991 to 1994 releases	229	36.8 (11.2)	2.9 (1.9)	42	2	5.7	Charges
Millbrook, Ontario	186	33.3 (9.8)	3.1 (2.1)	100	23	35.5	Convictions
Institut Philippe Pinel	343	36.2 (10.9)	2.9 (1.7)	70	4	14.9	Convictions
HM Prison Service (UK)	521	35.6 (12.3)	3.0 (2.0)	52	16	25.0	Convictions
Washington State SSOSA	490	36.0 (12.5)	1.3 (1.3)	89	5	6.3	Charges
Manitoba Probation	202	35.5 (12.5)	2.7 (1.8)	56	2	9.9	Charges
Canadian Federal – Quebec	487	42.9 (12.0)	2.7 (2.0)	52	5	6.8	Charges
Dynamic Supervision Project	967	40.0 (13.4)	2.8 (1.9)	53	2	3.0	Charges
Total	3,425	37.9 (12.6)	2.6 (1.9)	63	7	15.7	

Millbrook Recidivism Study (Hanson, Steffy, & Gauthier, 1993b; see also Hanson, Scott, & Steffy, 1995; Hanson, Steffy, & Gauthier, 1993a). This study collected long-term recidivism information (15–30 years) for child molesters released between 1958 and 1974 from Millbrook Correctional Centre, a maximum security provincial correctional facility located in Ontario, Canada. About half of the sample went through a brief treatment program. Recidivism information was coded from RCMP records in 1989 and 1991. Information was not available for Non-contact sex offences. Sentencing occasions for anything was approximated by dividing the number of prior convictions by 1.5.

Institut Philippe Pinel (Montreal) (Proulx, Pellerin, McKibben, Aubut, & Ouimet, 1995; see also Proulx, Pellerin, McKibben, Aubut, & Ouimet, 1997; Pellerin et al., 1996). This study focused on sexual offenders treated at a maximum security psychiatric facility between 1978 and 1993. During this period, the Institut Philippe Pinel in Montreal provided long term (1–3 years) treatment for sexual offenders referred from both the mental health and correctional systems. Recidivism information was collected in 1994 from RCMP records. Information was not available concerning Stranger victims, Non-contact sex offences, and Index non-sexual violence.

Her Majesty's Prison Service (UK) (Thornton, 1997). This study provided a 16 year follow-up of all sexual offenders released from Her Majesty's (HM) Prison Service (England and Wales) in 1979. Recidivism information was based on Home Office records collected in 1995. Very few of the offenders in this sample would have received specialized sexual offender treatment. Information was available to code all Static-99 items.

Washington (Song & Lieb, 1998; see also Berliner, Schram, Miller, & Milloy, 1995; Song & Lieb, 1995). This data set was created to evaluate Washington State's Special Sex Offender Sentencing Alternative (SSOSA), which allows judges to sentence sex offenders to community treatment. To be eligible for SSOSA, offenders must be facing their first felony conviction for sexual crimes other than first or second degree rape. The sample consisted of 287 offenders who received SSOSA and 300 who were statutorily eligible for SSOSA but did not receive it. The majority of the sample was White (85%). Offenders were convicted between January, 1985 and June, 1986, with follow-up data collected in December, 1990. Information was missing concerning Prior non-sexual violence and Index non-sexual violence. Non-contact sex offences were approximated by "index convictions were only exhibitionism or peeping;" Sentencing occasions for anything was approximated by dividing the number of prior convictions by 1.5.

Manitoba Probation (Hanson, 2002a). This follow-up study was conducted as an evaluation of a risk scale used by probation officers in Manitoba, Canada. The 202 offenders were consecutive admissions to probation between May, 1997 and February, 1999. Recidivism information was collected in November, 2000, based on RCMP records. Unlike the RCMP records used in the other studies (which included only charges and convictions that went to court), the RCMP records for the Manitoba sample included unresolved charges and cases currently under police investigation. The demographic, victim, and offence information was collected by the probation officers in the course of their normal duties. The criminal history variables needed for coding Static-99 were coded by trained research assistants (median $r = .93$; median Kappa = .87). Information was missing concerning male victims.

Dynamic Supervision Project (Hanson, Harris, & Thomas, 2005; Harris & Hanson, 2003). Offenders were selected from all provinces and territories of Canada as well as the states of Alaska and Iowa. The aim of this prospective study was to test the validity of a system of risk assessment for sexual offenders on community supervision (probation or parole). Assessments were conducted between 2001 and 2004, with recidivism information provided on an ongoing basis by the officers supervising the cases (up to February, 2005). Of the

total sample of 967, 5.7% were developmentally delayed, 11.5% had a history of psychiatric hospitalisation, and 19% were of aboriginal heritage. Static-99 scores were coded by the officers supervising the cases (intraclass correlation of .91, $N = 88$).

Plan of analysis

The combined effects of Static-99 and age were testing using Cox regression with each sample identified as a stratum (SPSS, 1999). Cox regression controls for time-at-risk and permits both linear and categorical predictors (Cox & Oakes, 1984). Specifying each study as a stratum minimizes variance due to differences in the definitions of recidivism across samples. The exponent of the Cox regression weights can be interpreted as rate ratios, that is, the change in the recidivism rate for each unit change in the predictor variable.

Results

The average age at release was 37.9 years ($SD = 21.6$), with a range from 18 to 85. Most of the offenders (83%) were less than 50 years old, 6% over 60, and 1.5% were over 70 ($N = 54$). Of the total 3,425 offenders, 15.7% were charged or reconvicted of a sexual offence at some point during the follow-up period. The five year sexual recidivism rate based on survival analysis was 12.0 (95% confidence interval of 10.6% to 13.4%). The average Static-99 score was in the moderate-low range for all samples, with the exception of the Washington State SSOSA sample, for which the average score was in the low range (1.3).

Older offenders had lower Static-99 scores than younger offenders ($r = -.199$, $df = 3,423$, 95% C.I. of $-.166$ to $-.232$). Offenders younger than 25 had the highest scores (3.6, $SD = 1.4$), followed by offenders aged 25 to 39 (2.6, $SD = 1.9$), offenders in their forties (2.4, $SD = 2.0$), offenders in their fifties (2.3, $SD = 2.0$) and offenders older than 60 (1.9, $SD = 1.9$). When the age item was removed from the Static-99, the remaining items were still significantly correlated with age, although the association was smaller ($r = -.093$; $df = 3,423$, 95% C.I. of $-.060$ to $-.126$). In all subsequent analyses and tables, readers should assume that Static-99 scores included the age item, unless otherwise indicated.

As can be seen in Table 2, age at release made a significant contribution to the prediction of sexual recidivism after controlling for Static-99 scores (χ^2 change = 17.49, $df = 1$, $p < .001$). The interaction between age and Static-99 scores was not significant, meaning that the amount of age related decrease in risk was the same for all risk levels (χ^2 change = 0.175, $df = 1$, $p > .60$).

Of the total 3,425 offenders, 2,727 were classified as rapists ($N = 886$) or child molesters ($N = 1,841$, including incest offenders) by the original researchers. The categorization was based on the predominant (or exclusive) victim type, although the precise age limits varied across samples. Offenders not classified or classified as “mixed” were eliminated from the analysis. Victim type (rapist/child molester) did not contribute significantly to the prediction of sexual recidivism once Static-99 and age were considered (χ^2 change = 2.12, $df = 1$, $p = .14$). The interaction between Static-99 and victim type was also not significant (χ^2 change = 0.14, $df = 1$, $p = .70$) neither was the interaction between age and victim type (χ^2 change = 0.58, $df = 1$, $p = .44$) or the three-way interaction among Static-99, age and victim type (χ^2 change = 0.29, $df = 1$, $p = .59$).

When Static-99 scores were controlled, the relationship between age and sexual recidivism risk was not completely linear (see Table 2, Block 3b). An additional component was

Table 2 Cox regression survival analysis for Static-99 and age predicting sexual recidivism

	<i>B</i>	<i>SE</i>	<i>e^B</i>	95% CI for <i>e^B</i>		χ^2 change from previous block
				Lower	Upper	
Block 1						142.57***
Static-99	.306	.025	1.36	1.29	1.43	
Block 2						17.49***
Static-99	.302	.026	1.35	1.28	1.42	
Age at release	−.019	.005	.98	.97	.99	
Block 3a						0.18
Static-99	.335	.083	1.40	1.19	1.64	
Age at release	−.016	.010	.98	.97	1.00	
Interaction	−.00089	.00213	.999	.995	1.003	
Block 3b						11.12***
Static-99	.307	.026	1.36	1.29	1.43	
Age at release	.072	.030	1.07	1.01	1.14	
Age ² (curve)	−.0012	.000395	.999	.998	.999	

*** $p < .001$.

evaluated by entering the variable “(age at release) $\times$ (age at release),” that is “age-squared,” as a separate step after entering Static-99 and age at release. The cubic component (two curves) was non-significant (χ^2 change = 0.53, $df=1$, $p=.46$), nor was the interaction between age-squared and Static-99 scores (χ^2 change = 0.338, $df=2$, $p=.84$).

The Cox regression weight for age cannot be easily interpreted once the curve component is also entered; however, it is possible to use the equation generated by the regression model that includes age and age-squared to identify a peak or a valley (the point where the rate of change is zero; Iversen, 1996). When controlling for Static-99, the recidivism risk increased slightly between age 18 and 30, then declined thereafter. The shape of the curve was such that offenders over age 41 started to show lower age-related recidivism risk than 18 year olds and that the rates declined thereafter with further increases in age.

The apparent decrease in the 18–25 age range is expected because youthful offenders already get one Static-99 point for “Age less than 25” and, therefore, must have fewer of the other risk factors to have Static-99 scores equivalent to those of older offenders. When the age item is removed from the Static-99 total score, the effect for age-squared (controlling for the additional Static-99 items) was no longer significant (Wald = 3.58, $df=1$, $p=.058$). Without controlling for Static-99, the effect for age-squared was statistically significant (Wald = 4.90, $df=1$, $p=.027$), but small: the peak was at 22 years—near the lower end of the age range. The combined effects of age and age-squared were statistically significant when the “Age less than 25” item was omitted from Static-99 (χ^2 change = 36.8, $df=2$, $p<.001$) or included in Static-99 (χ^2 change = 28.6, $df=2$, $p<.001$).

Table 3 presents the five year sexual recidivism rates by age and Static-99 risk category. The recidivism rates and confidence intervals were calculated with the Life Tables Survival routine in SPSS Version 12.0 (SPSS, 2003). The sample size refers to the number of offenders starting the interval; not all offenders were followed for the full five years. The average recidivism rates steadily declined with age, from 16.2% in the offenders younger than 25, to 2.0% for offenders older than 60. Visual inspection of the table shows the curvilinear effect identified through the survival analyses. When controlling for Static-99 risk categories, the recidivism rates for offenders younger than 25 were similar to the recidivism rates of the offenders in the 25 to 40 age range. Starting at age 40, the recidivism rates declined. There

Table 3 Five year sexual recidivism rates divided by age and Static-99 risk categories

Static-99 category	Age at release				40–49.9		50–59.9		60 and older		All ages	
	18–24.9	25–39.9	40–49.9	50–59.9	60 and older	All ages	recid. $\pm$ 95%CI	n	recid. $\pm$ 95%CI	n	recid. $\pm$ 95%CI	n
Low	17	5.8 $\pm$ 11.2	486	6.7 $\pm$ 2.7	321	5.5 $\pm$ 2.9	159	2.5 $\pm$ 2.8	112	0.0 $\pm$ 0.0	1095	5.3 $\pm$ 1.6
Moderate-low	275	7.6 $\pm$ 3.7	590	11.7 $\pm$ 3.3	260	6.7 $\pm$ 4.3	126	4.3 $\pm$ 4.4	56	3.0 $\pm$ 5.7	1307	8.7 $\pm$ 1.9
Moderate-high	199	24.6 $\pm$ 7.4	321	24.3 $\pm$ 5.9	124	13.8 $\pm$ 8.0	63	19.4 $\pm$ 16.1	25	4.8 $\pm$ 9.1	732	21.4 $\pm$ 3.8
High	61	35.5 $\pm$ 14.9	116	37.5 $\pm$ 11.3	71	25.7 $\pm$ 13.2	32	24.3 $\pm$ 22.6	11	9.1 $\pm$ 17.0	291	31.6 $\pm$ 6.9
All levels	552	16.2 $\pm$ 3.6	1513	14.4 $\pm$ 2.2	776	8.8 $\pm$ 2.5	380	7.5 $\pm$ 3.8	204	2.0 $\pm$ 2.3	3425	12.0 $\pm$ 1.4
Average		3.6 (1.4)		2.6 (1.9)		2.4 (2.0)		2.3 (2.0)		1.9 (1.0)		2.6 (1.9)
Static-99 mean (SD)												
AUC (95% CI)		.68 (.62–.74)		.68 (.64–.72)		.66 (.58–.73)		.76 (.66–.85)		.82 (.68–.95)		.70 (.67 –.72)

Note. “recid. $\pm$ 95%CI” is the sexual recidivism rate calculated through survival analysis with its 95% confidence interval. “n” is the sample size starting the interval. AUC is the area under the receiver operating characteristic curve.

was, however, one exception: the moderate-high offenders in their 40s had lower recidivism rates (13.8%) than moderate-high offenders in their 50s (19.4%). Given that the confidence intervals for these estimates overlapped and that the overall interaction between Static-99 and age was not significant, there is no evidence that this deviation from the overall trend was more than would be expected by chance.

Although the overall recidivism rates were lower for the older offenders, Static-99 was equally effective at ranking the relative risk of both the younger and older offenders. The overall ROC AUC was .70 and ranged from a low of .66 for the 40–49 age group to a high of .82 for offenders over 60 (see Table 3). The confidence intervals for the AUC overlapped for all age groups, again suggesting that the predictive accuracy of Static-99 was similar for all age groups. In order to minimize variance due to differing follow-up times across samples, the ROC AUCs were calculated from the survival estimates in Table 3, which control for time at risk, rather than the raw recidivism rates.

Of the 54 men released after the age of 70, there was only one sexual recidivist (The same 72 year old offender included in Hanson, 2002b). This recidivist was a child molester with a Static-99 score of 4. The Static-99 scores for the remaining 53 non-recidivists ranged from 0 to 8 (mean = 1.8, SD = 2.2, median = 1). For offenders over the age of 70, The Static-99 AUC was .86 (95% C.I. of .76 to .95), but this finding should be treated with extreme caution as it was based on only one recidivist.

Discussion

The present study found that advanced age contributed information to the prediction of sexual recidivism risk after controlling for Static-99—a commonly used actuarial measure for sexual offenders. When controlling for Static-99 scores, the influence of age was curvilinear, with 30 years being the age at greatest risk. In all the analyses (with or without controlling for Static-99 risk factors), there was a steady decline in recidivism rates for offenders after the age of 40 years. The five- year recidivism rates of offenders over 60 was only 2%, compared with 14.8% for offenders less than 40.

Static-99 was equally effective in ranking the relative risk of offenders in all age groups. However, the standard Static-99 norms (Harris et al., 2003, Appendix 6) overestimated the recidivism rates of the oldest offenders. There was no significant interaction between age and risk level, indicating that the age related declines should be expected for low, moderate, and high risk offenders as defined by Static-99.

The current results are specific to one risk instrument, and it cannot be assumed that age would add to the predictive accuracy of other risk instruments. The Sex Offender Risk Appraisal Guide (SORAG; Quinsey, Harris, Rice, & Cormier, 2006), for example, assigns points ranging from +2 to –5 for offenders between the ages of 26 and 39 at the time of the index offence; including the full range of age as a separate variable did not improve the prediction of sexual recidivism (Grant Harris, personal communication, June 8, 2002). In Static-2002 (Hanson & Thornton, 2003), the following weights captured all the unique variance attributable to age at release: 18 – 24.9 = 3; 25 – 34.9 = 2; 35 – 39.9 = 1; and 50 and older = 0 (i.e., 3 out of a possible 14 total points).

Researchers should continue to strive to find the best method of weighing age in actuarial risk tools, but even optimal age weights would not be expected to result in large increases in the overall predictive accuracy of actuarial measures. There are few offenders in the age categories most influenced by age (i.e., over 60), so how they are treated by an actuarial

instrument would make little difference in the scale's overall predictive accuracy. Empirically, scales that give more weight to age than does Static-99 have not demonstrated superior overall predictive accuracy for the prediction of sexual recidivism (Boer, 2003; Hanson & Morton-Bourgon, 2004).

Sexual offenders risk assessments are likely to improve as researchers identify the reasons for the lower recidivism rates among older sexual offenders. The first question is the extent to which recidivism risk of individual offenders actually declines with age. The current data were cross-sectional, which means that the low recidivism rates among the older offenders could be attributed to lower risk offenders being apprehended at older ages. Although the age effects remained after controlling for Static-99 risk variables, Static-99 does not measure all variables related to risk (the older offenders could be lower risk for other reasons). The observation that the Static-99 scores (excluding the age item) were lower for the older offenders supports the position that the older offenders were different from the younger offenders and not simply equivalent offenders "grown up." With increased age, an offender's total crime's would be expected to increase, which should result in increased Static-99 scores.

Longitudinal studies of general offenders, however, have found that even the most persistent offenders show substantial declines in crime with age (Sampson & Laub, 2003). Consequently, it is important to identify the factors that could contribute to declines in recidivism risk among sexual offenders. Hanson (2002b) argued that older sex offenders are at lower risk because of declining sexual drive, increased self-control, and decreased access to victims. Age-related declines in sexual drive are supported by decreased sexual activity among older men in the general population (Långström & Hanson, 2006) and by decreased arousal in older sexual offenders (Barbaree et al., 2003; Blanchard & Barbaree, 2005). In the general population, advanced age is associated with increased emotional stability, agreeableness, and conscientiousness (Roberts, Walton, & Viechtbauer, 2006), all factors that should limit the expression of sexual aggression.

One question for further research is the extent to which the observed declines in recidivism potential are mediated by poor health. It is quite plausible, for example, that a vigorous 50 year old offender may maintain the same recidivism risk as he did when he was 35. Although shortened life expectancy effectively lowers long-term recidivism risk, it would be useful for evaluators to be able to separate the influences of shorter life expectancies from other personal characteristics that could mitigate recidivism risk in older offenders. Death records were not available in the current study. Another question is whether the crimes of the elderly are perceived as seriously as the crimes of the young. It is possible that the same sexual misbehaviour could be treated as "criminal" when committed by a strong, young man but be treated as inappropriate (or pathetic) when the perpetrator is himself frail and vulnerable.

Further research is needed to know how advanced age influences the recidivism risk of offenders who grow old in prison. The offenders deemed most dangerous by the criminal justice system are likely to serve very long sentences and would be under represented in recidivism studies. The current study did not distinguish between offenders who were released after serving very long sentences and those convicted at an advanced age. Based on typical sentences in the jurisdictions involved, most of the offenders would have served relatively short sentences (less than 4 years) and approximately one third were not incarcerated at all for their index offence. Hanson and Bussière (1998) found a small positive relationship between current sentence length and sexual recidivism (average $r = .04$); few of the offenders in their sample, however, would have been incarcerated long enough to substantially change their age at release. The overall finding that age reduces the risk of most offenders does not

preclude the existence of a select few offenders whose risk remains unacceptably high as long as they are physically capable.

Implications for applied evaluations

Evaluators using Static-99 should consider advanced age as one factor in their overall estimate of risk. How best to consider age remains unresolved by the current study. The average age of the offenders was 38 years in the current sample (34 years in the Static-99 development samples), so there is little justification for using age to reduce the expected Static-99 recidivism rates for offenders under 40. At the other end of the age range, offenders over 60 appeared substantially lower risk than expected. There were very few offenders over the age of 60, and their recidivism risk was low even when Static-99 scores were controlled. In the 40–60 age range, however, there was no clear dividing line where evaluators would be compelled to consider advanced age as a mitigating factor, although some consideration of age could be justified somewhere in this age range.

Although it is possible to compute numeric estimates of the combined effect of Static-99 and advanced age using the numbers in Tables 2 and 3, the stability of these estimates will be unknown until they have been replicated in independent samples. Even large samples contain chance variations and unique features that may not generalize to other samples. Consequently, evaluators using Static-99 with older offenders are left with the familiar problem of knowing that a factor external to an actuarial scheme contributes information to risk assessment, but lacking sufficient scientific evidence to formally include the factor in the actuarial measure. How evaluators proceed in the face of this dilemma depends on the confidence they place in the specific actuarial measure, the evidence supporting the external factor, and the potential contribution of other factors considered (or not) in the overall evaluation.

Acknowledgements I would like to thank R. Lieb, L. Motiuk, J. Proulx, and D. Thornton for permission to use data included in this report. The views expressed are those of the author and are not necessarily those of Public Safety Canada.

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