

## Should Static-99 Recidivism Estimates be Adjusted Based on Age at Release? A Multi-Sample Exploration

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## Age and Sexual Recidivism

- General crime declines with age (Hirschi & Gottfredson, 1983; Sampson & Laub, 2003)
- Sexual recidivism too (Barbaree & Blanchard, 2008; Hanson, 2002, 2006)
- Some debate over whether age at first offence is better predictor than “aging” or current age (Harris & Rice, 2007)

## Static-99: 23 samples (N = 8,412)

- Allan et al. (2007)
- Bartosh et al. (2003)
- Bengtson (2008)
- Bigras (2007)
- Boer (2003)
- Bonta & Yessine (2005)
- Brouillette-Alarie & Proulx (2008)
- Cortoni & Nunes (2007)
- Craissati et al. (2008)
- Eher et al. (2008)
- Epperson (2003)
- Haag (2005)

## Static-99: 23 samples (N = 8,412)

- Hanson et al. (2007)
- Harkins & Beech (2007)
- Hill et al. (2008)
- Johansen (2007)
- Knight & Thornton (2007)
- Långström (2004)
- Nicholaichuk (2001)
- Saum (2007)
- Swinburne Romine et al. (2008)
- Ternowski (2004)
- Wilson et al. (2007a,b)

## Preparing the datasets

- Corrected coding errors or inconsistencies where possible
- Deleted cases if:
  - ❖ No follow-up information
  - ❖ Any item other than “ever lived with a lover for two years” is missing
  - ❖ Inconsistencies not resolvable

## Basic descriptive information

- Most offenders released 1990 or later
- Samples from Canada, US, UK, Europe
- Primarily treated
- Mean age ~40
- 12 samples used charges as recidivism definition; 11 used convictions
- 37% rapists, 54% child molesters (N = 6,251 with offender type info)

## Age and Static-99

	n	Static-99 Mean
< 50	6,414	3.2
50 – 59.99	971	2.5
60 – 69.99	439	2.3
70+	135	2.3

## Age at Release

- Rate ratio of .98 (95% C.I. of .98 to .99)
  - ❖ Expected recidivism rate of 32-year old offenders is 98% of the recidivism rate of 31-year old offenders, which is 98% of 30-year old offenders, etc....
  - ❖ Tested with Cox regression using sample as strata (x2 change = 28.7, df = 1, p < .001) and controlling for Static-99 (k = 21, n = 7,878)
- Non-linear (adding age<sup>2</sup>, x2 change = 10.7, df = 1, p = .001)
- Adding age<sup>3</sup> non-significant
- Age adjustment is necessary

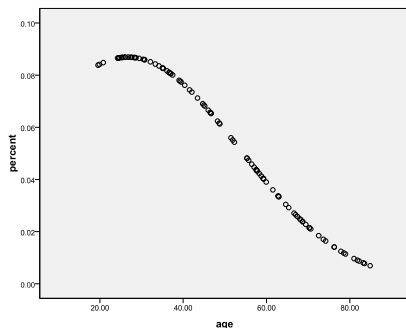
## Age at release versus Age at index

- No info available on age at first offence
- But did have info on age at index (k = 14, n = 5,572)
  - ❖ Used age at commission of index offence where available (k = 4, n = 1,601)
  - ❖ Most defined as age at conviction for index offence (k = 10, n = 3,971)

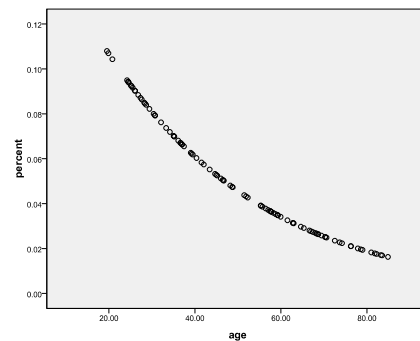
## Age at release versus Age at index

- Age at release added significant contribution after controlling for Static-99, age at index, and sample as strata
  - ❖ x2 change = 18.5, df = 1, p < .001
  - ❖ Quadratic effect also significant (x2 change = 5.6, df = 1, p = .018)

## Age at release: Static-99



## Static-99 without the age item



## Developing new age item

- Cases with age at release info and age-free Static-99 scores (k = 23, n = 8,128)
  - ❖ Development sample (k = 23, n = 5,736) – all cases with < 10 years follow-up
  - ❖ Validation sample (k = 15, n = 2,392) – all cases with 10+ years follow-up

## Selecting new age weights

- Principles guiding selection
  - ❖ Similar odds ratio for Static-99 (one-point Static increase associated with ~1.35 increase in odds of recidivism)
  - ❖ Median age (39) get score of 0
  - ❖ Higher predictive accuracy than original Static
  - ❖ Age should no longer contribute

## Selecting new age weights: Process



VERSUS



## Selecting new age weights: Process



VERSUS



Result: Virtually the same weights



## New age item

Age at release	Points
18-34.999	+1
35-39.999	0
40-59.999	-1
60+	-3

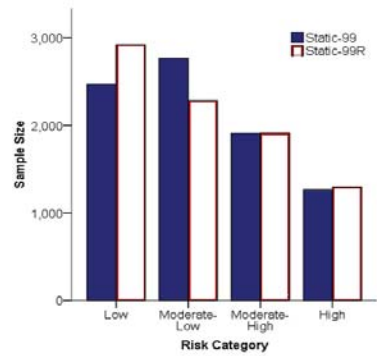
## Static-99R

- Revised version of Static-99
  - ❖ Original age item removed
  - ❖ New age item added
- Total scores range from -3 to 12

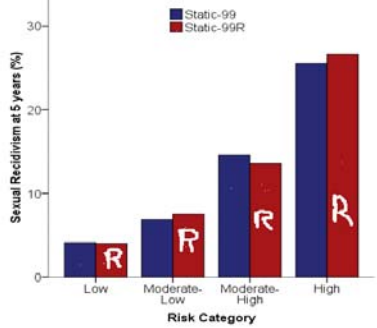
## Nominal risk categories

- Static-99
  - ❖ 0-1: Low
  - ❖ 2-3: Moderate-Low
  - ❖ 4-5: Moderate-High
  - ❖ 6+: High
- ➔
- Static-99R
  - ❖ -3 to 1: Low
  - ❖ 2-3: Moderate-Low
  - ❖ 4-5: Moderate-High
  - ❖ 6+: High

## Distribution of Sex Offenders by Risk Category



## Percentage of Sexual Recidivists by Risk Category



## Comparing Static-99 to Static-99R: Validation sample (n = 2,392)

	ROC 5 years	ROC 10 years
Static-99	.713	.706
Static-99R	.720	.710

## Age fully accounted for in Static-99R

	Static-99		Static-99R	
	X2 Δ	p	X2 Δ	p
Log. Reg. 5yr				
Static	128.92	< .001	135.82	< .001
Age	4.14	.042	1.27	.260
Log. Reg. 10yr				
Static	157.91	< .001	164.45	< .001
Age	5.54	.019	1.46	.227
Cox Regression				
Static	165.92	< .001	180.14	< .001
Age	7.87	.005	0.66	.418

## Static-99R: Statistical Shrinkage?

	ROC	Log. Reg. Odds Ratio	Cox Reg. Rate Ratio
Development	.709	1.32	1.36
Validation	.720	1.34	1.28

### Static-99R for rapists and child molesters

	Rapists		Child Molesters	
	b	p	b	p
Log. Reg. 5yr				
Static-99R	.317	< .001	.319	< .001
Age	-.006	.583	.0007	.926
Log. Reg. 10yr				
Static-99R	.325	< .001	.269	< .001
Age	.001	.966	.005	.591
Cox Regression				
Static-99R	.281	< .001	.269	< .001
Age	.002	.778	.002	.689

### ROC Analyses

	Static-99	Static-99R
< 50	.695	.700
50+	.700	.709
60+	.674	.674
70+	.609	.609

### Age and Static-99R

Age	n	Mean Static-99R
< 50	6,414	3.2
50 – 59.99	971	1.5
60 – 69.99	439	-0.7
70+	135	-0.6

### 5 year Sexual Recidivism

Static-99R category	Less than 50		50 and older	
	Recid n	%	Recid n	%
Low	50/1229	4.1	20/711	2.8
Low-Mod	97/1324	7.3	13/154	8.4
Mod-High	170/1212	14.0	11/84	13.1
High	221/831	26.6	10/46	21.7
	538/4596	11.7	54/995	5.4

### 5 year Sexual Recidivism

Static-99R category	Less than 60		60 and older	
	Recid n	%	Recid n	%
Low	66/1630	4.0	4/310	1.3
Low-Mod	107/1450	7.4	3/28	10.7
Mod-High	179/1270	14.1	2/26	7.7
High	231/873	26.5	0/4	0
	583/5223	11.2	9/368	2.4

### 5 year Sexual Recidivism

Static-99R category	Less than 70		70 and older	
	Recid n	%	Recid n	%
Low	68/1877	3.6	2/63	3.2
Low-Mod	110/1472	7.5	0/6	0
Mod-High	181/1291	14.0	0/5	0
High	231/876	26.4	0/1	0
	590/5516	10.7	2/75	2.7

## Static-99R

- Static-99 does not fully account for age at release
- New age item created. Replaces age item in Static-99 (hence, Static-99R)
- Using Static-99R, no further age adjustments would improve prediction
- Works well for rapists and child molesters

## Static-99R and older offenders

- Works well for group over 50
- Over 60, predictive accuracy a bit lower
- Over 70, prediction much lower
- For offenders over 60
  - ❖ Almost all low risk or low-mod
  - ❖ Few high scores
  - ❖ Restriction of range for relative risk (AUC)

## Recommendations

- In all cases, use Static-99R in place of Static-99
- For 18 – 60, Static-99R produces consistent relative risk and absolute risk estimates for all age groups. Age need not be considered further
- For 60 – 70, Static-99R works to distinguish low and moderate risk.
- High risk sexual offenders over the age of 60 are truly exceptional.
- Assume all offenders over the age of 70 are low risk.

## Thank you!

For more information, please contact:

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See also [www.Static99.org](http://www.Static99.org)