

Actuarial Assessment of Sex Offender Recidivism Risk: A Validation of the German version of the Static-99¹

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Abstract

The Static-99 and the RRASOR are actuarial risk assessment tools for evaluating the risk of sexual and violent recidivism in sexual offenders. The Static-99 was developed in 1999 by Karl R. Hanson (Canada) and David Thornton (Great Britain) and is in the mean time regularly used for risk assessment in North America and some countries in Europe. The RRASOR can be described as a predecessor of the Static-99 and was published by Hanson in 1997. At first we translated the revised version of the Static-99 (Harris, Phenix, Hanson & Thornton, 2003) and adapted the instrument and the manual to the forensic context in Germany and Austria (Rettenberger & Eher, 2006). In this retrospective study, interrater reliability and concurrent validity of the RRASOR and of the German adaption of the Static-99 is presented. Furthermore we evaluated the predictive accuracy of the Static-99 and the RRASOR and compared their results. The instruments were validated from file information of Austrian sexual offenders, who were convicted between 1968 and 2002. Both the Static-99 and the RRASOR had good interrater reliability and concurrent validity. The Static-99 showed good predictive validity for general ($r = .41$, $AUC = .74$), sexual ($r = .35$, $AUC = .74$) and violent ($r = .41$, $AUC = .76$) recidivism, whereas the predictive accuracy of the RRASOR was moderate for general ($r = .29$, $AUC = .66$), sexual ($r = .30$, $AUC = .68$) and violent ($r = .28$, $AUC = .67$) recidivism. The Static-99 exhibited a higher accuracy for the prediction of sexual offender recidivism. Although further validation studies on German-speaking populations of sex offenders are necessary, these results support the utility of the German version of the revised version of the Static-99 in improving risk assessment of sexual offenders.

Key words: Static-99, RRASOR, risk assessment, sexual offenders, actuarial risk assessment, validity, recidivism

Introduction

In recent years there has been a growing interest in validated risk-assessment tools for sex offenders in the German-speaking part of Europe (Noll, Endrass, Rossegger, & Urbaniok, 2006). Compared to North America where actuarial assessment instruments are regarded as state of the art there are only very few studies in Germany or Austria that have dealt with these instruments. Although the results of a number of studies from North America support the utility of the actuarial approach to risk assessment of sexual offenders (e.g. Barbaree, Seto, Langton, & Peacock, 2001), validation studies on German-speaking populations are necessary before the use of these instruments can be recommended in Germany and Austria.

In this study we translated the revised version of the *Static-99* (Harris, Phenix, Hanson, & Thornton, 2003) and adapted the instrument and the manual to the forensic context in Germany and Austria

(Rettenberger & Eher, 2006). The Static-99 is a brief actuarial instrument for the assessment of risk for sexual and violent recidivism of adult sexual offenders. It was developed in 1999 by Karl R. Hanson (Canada) and David Thornton (Great Britain) and is in the meantime regularly used for risk assessment in North America and some countries in Europe. The instrument is derived from a fusion of two previously developed risk assessment instruments, the *Rapid Risk Assessment of Sexual Offender Recidivism* (RRASOR; Hanson, 1997) and a shorter version of the *Structured Anchored Clinical Judgement* (SACJ-Min; Grubin, 1998) composed of ten mainly static risk factors (see Table 1). The individual risk factors of a sexual offender add up to a maximum total score of 12 that is subsequently translated into four risk categories: low (0-1), medium low (2-3), medium high (4-5), and high (6 or more).

Table 1: Items and coding form of the Static-99

Item number	Risk Factor	Codes		Score
1	Young	Aged 25 or older		0
		Aged 18 – 24.99		1
2	Ever lived with an intimate partner for at least two years?	Yes		0
		No		1
3	Index non-sexual violence – Any Convictions?	No		0
		Yes		1
4	Prior non-sexual violence – Any Convictions?	No		0
		Yes		1
5	Prior sex offenses	Charges		
		Conventions		
		None	None	0
		1-2	1	1
		3-5	2-3	2
6+	4+	3		
6	Prior sentencing dates	3 or less		0
		4 or more		1
7	Any convictions for non-contact sex offenses	No		0
		Yes		1
8	Any unrelated victims	No		0
		Yes		1
9	Any stranger victims	No		0
		Yes		1
10	Any male victims	No		0
		Yes		1

The RRASOR was published in 1997 by Hanson and consists of four items: Prior sex offenses, age at release (current age), victim gender, and relationship to victim. In a meta-analytic review Hanson and Bussière (1996) found that indicators of deviant sexual interests (e.g. the number of prior sex offenses) consistently predicted sexual recidivism. Drawing from these results, Hanson (1997) selected variables with a minimum correlation of .10 with sexual recidivism and developed the RRASOR. Across seven development samples, comprising a total of 2,592 sexual offenders, Hanson found that RRASOR scores had an average correlation of .27 and an average *Area Under the Curve of the Receiver Operating Characteristic* (AUC of the ROC) of .71 with sexual recidivism. Hanson and Thornton (1999) tested the predictive accuracy of the RRASOR and the Static-99 using four different, mixed data sets of 1,301 sexual offenders (including child molesters and rapists from prison as well as secure forensic psychiatric settings) collected in Canada and the United Kingdom. Average follow-up times ranged from 4 to 23 years and sexual recidivism base rates were 15-35%. The RRASOR exhibited a predictive accuracy significantly higher than chance with an AUC of .68 for sexual and .64 for any violent (including sexual) recidivism. The same analyses for the Static-99 rendered an AUC of .71 for sexual and .69 for any violent (including sexual) recidivism. The authors emphasize the importance of replication, because if similar results are found across samples, then the instrument would appear robust and can be adopted in other sociocultural and legal contexts. Meanwhile results from studies with Canadian, Dutch, German, and Swedish samples of sex offenders were presented, whereas in the Dutch and German studies only the Static-99 was used. In the Canadian study published by Barbaree, Seto, Langton, and Peacock (2001) in a mixed sample of 215 child molesters and rapists assessed for a prison-based treatment program, the base-rate for registered sexual offenses involving physical contact was 9% after an average follow-up time of 4.5 years. The RRASOR and the Static-99 exhibited moderate and significant predictive accuracy (AUC of .77 for the RRASOR and of .70 for the Static-99) concerning sexual recidivism. In a large cross-validation sample of 1,400 sexual offenders followed for an average of 3.7 years in Sweden, Sjöstedt and Långström (2001) found that the RRASOR had a correlation of .22 and an AUC of .72 with sexual recidivism. For the Static-99 they reported an AUC of .76 for sexual recidivism and of .74 for nonsexually violent recidivism. In the retrospective study of de Vogel, de Ruiter, van Beek, and Mead (2004) with a Dutch sample of 122 sex offenders the base rate for sexual recidivism was 39%, for nonsexual violent offenses 46%, and for general offenses 74%. The average follow-up period was 11.7 years. The authors reported a moderate and significant predictive accuracy for their Dutch adaptation of the Static-99 for sexual recidivism: For Static-99 total score they found a correlation of .38 and an AUC of .71. However, for nonsexual violent and for general recidivism they did not find significant results: For violent reoffending the correlation was .11 and the AUC .54, for general reoffending the correlation was .13 and the AUC .57. In a German validation study of Stadtland, Hollweg, Kleindienst, Dietl, Reich, and Nedopil (2005) with 134 sex offenders and a mean follow-up time of 9 years the Static-99 showed an AUC of .71 (including treatment dropouts) and .72 (excluding treatment dropouts), respectively. In this study the base rate for sexual reoffending was 37% and for violent (but not sexual) reoffending 5%. The primary aim of this retrospective study was the verification of the application of the revised version of the Static-99 to the forensic context in Austria. Therefore we present interrater reliability, concurrent validity, and predictive validity of this German adaptation of the Static-99 that was evaluated with an Austrian sample. Furthermore we calculated the interrater reliability, the concurrent validity, and the predictive accuracy of the RRASOR and compared the results of both assessment tools; we expect that our findings are in accordance with previous studies from North America and Europe, and the predictive accuracy of the Static-99 will be higher than the performance of the RRASOR.

Method

Subjects

In order to examine the predictive accuracy of the German version of the Static-99, we cross-validated the instrument using file information of 81 sexual offenders released either from prison (61.7%, $n = 50$) or from secure forensic psychiatric settings (38.3%, $n = 31$) in Austria (mean age = 36.43 years, $SD = 10.78$, range 18-71). The average follow-up time was 7.7 years ($SD = 3.42$, range 3-16). The group consisted of 58 child molesters, 15 rapists, 7 sexual murderers and one exhibitionist, all male. The mean sentence length for all convicted sex offenders was 52.01 months ($SD = 144.48$, range 2-240). 44.4% ($n = 36$) had a previous conviction for a sexual offense and 71.6% ($n = 58$) had any prior conviction. In order to examine the interrater reliability and the concurrent validity of the German version of the Static-99, we gathered information about 202 sex offenders from the database of the *Federal Documentation Centre of Sex Offender* (Justizanstalt Wien-Mittersteig, Außenstelle Floridsdorf) in Austria, who were still in prison at the time of data collection². The mean age of these 202 sexual offenders was 40.41 years ($SD = 11.73$, range 18-69). The group consisted of 98 child molesters, 91 rapists, 12 sexual murderers and one exhibitionist, all male. The mean sentence length for all convicted sex offenders was 72.44 months ($SD = 153.27$, range 2-240). 28.7% ($n = 58$) had a previous conviction for a sexual offense and 66.3% ($n = 134$) had any prior conviction.

Statistical Analysis

The interrater reliability of the Static-99 and the RRASOR was examined by Intraclass-Correlations (ICC) and average Pearson correlations between the raters. The predictive ability of the Static-99 and RRASOR was analyzed using Pearson correlations and the AUC of the ROC. To calculate the difference between the AUC values of the Static-99 and the RRASOR we used the program ROCKit version 0.9.1 (Metz, 1998). In order to establish the concurrent validity of the instruments, we calculated Pearson correlations between the Static-99 and the RRASOR on the one hand and the *Sexual Violence Risk-20* (SVR-20; Boer, Hart, Kropp, & Webster, 1997), the *Sex Offender Risk Appraisal Guide* (SORAG; Quinsey, Harris, Rice, & Cormier, 1998), and the *Psychopathy Checklist-Revised* (PCL-R; Hare, 1991) on the other hand. We chose the SVR-20, SORAG, and PCL-R, because there are already a number of validation studies (e.g. Quinsey, Rice, & Harris, 1995; Dempster & Hart, 2002; Barbaree et al., 2001; Harris, Rice, Quinsey, Lalumière, Boer, & Lang, 2003), so these instruments can be called internationally recognized risk-assessment tools for sex offenders (e.g. Müller-Isberner, Cabeza, & Eucker, 2000; Habermeyer & Herpertz, 2005). The SVR-20 is a structured clinical guideline designed for the assessment of risk for sexual violence in adult sex offenders. The instrument was developed from a thorough consideration of the empirical literature and the clinical expertise of a number of clinicians. The SVR-20 consists of 20 items, divided into three domains: Psychosocial adjustment, Sexual offenses, and Future plans, that have to be coded by an experienced forensic clinician. The SORAG is a modification of the *Violence Risk Appraisal Guide* (VRAG; Harris, Rice, & Quinsey, 1993), developed specifically to predict violent recidivism (which includes sexual offenses involving physical contact with the victim) among sex offenders. 10 of its 14 items are the same items as in the VRAG, so both instruments are highly correlated with each other, and both significantly predicted violent and sexual recidivism (Harris, Rice, Quinsey, Lalumière, Boer, & Lang, 2003). In contemporary research and clinical practice, Hare's Psychopathy Checklist-Revised (PCL-R) is the psycho-diagnostic tool most commonly used to assess Psychopathy. The PCL-R is based on semistructured interviews and review of file information. Participants are assigned ratings of 0 (absent), 1 (some indication), or 2 (present) on each of the 20 PCL-R items, tapping characteristics such as impulsivity, irresponsibility,

and callousness. Scale scores are obtained by summing the ratings, for a total possible score of 40. The conventional cutoff for making a diagnosis of Psychopathy in North America is 30, whereas in Europe the cutoff is mostly 25 (Hart & Hare, 1997; Hartmann, Hollweg, & Nedopil, 2001). In the development of the PCL-R, Hare was specifically interested in the construction of an instrument to quantify psychopathic personality traits, not an instrument to predict reoffenses. Nevertheless, research shows that the PCL-R does a reasonable job in predicting recidivism (e.g. Quinsey, Rice, & Harris, 1995).

Procedure

In order to establish the interrater reliability, four raters independently rated 27 cases. For the concurrent validity we gathered information from the files of 202 sex offenders listed in the database of the *Federal Documentation Centre of Sex Offender* (Justizanstalt Wien-Mittersteig, Außenstelle Floridsdorf) in Austria using the SVR-20, SORAG, and PCL-R, and we compared these results with our ratings of the Static-99 and RRASOR. Regarding the predictive validity we used the Static-99 and the RRASOR retrospectively on the basis of database files of a care facility for ex-prisoners in Vienna (*Forensisch Therapeutisches Zentrum Wien* [FTZW]). Data on recidivism were retrieved from the official Federal Central Register of the Austrian Department of Justice, whereas each new conviction, that was listed on the official criminal record, was counted as a reoffense. Sexual recidivism was defined as a new conviction for a sex offense in accordance with Austrian criminal law, comprising both hands-on and hands-off offenses³. In agreement with Hanson and Thornton (1999) we included sexual reoffenses in violent recidivism. Furthermore, we explored general recidivism by counting all new entries of offenses.

Results

Reconviction Rates

The reconviction rates after the average follow-up time of 7.72 years were 52% (n = 42) for general, 26% (n = 21) for sexual, and 35% (n = 28) for any violent recidivism (including sexual offenses).

Interrater Reliability

Using the critical values for ICC (single measure) of Fleiss (1986; ICC \geq .75 = excellent; .60 \geq ICC < .75 = good; .40 \geq ICC < .60 = moderate; ICC < .40 = poor), the interrater reliability of the Static-99 and the RRASOR were excellent: For the Static-99 we calculated an ICC = .90 (single measure, 95%-Confidence Interval [CI] = .83-.95) and an average correlation of $r = .92$. The interrater reliability of the RRASOR was lower but still very high: The ICC was .78 (single measure, 95%-CI = .64-.88) and the average correlation was $r = .81$.

Concurrent Validity

Both the Static-99 and the RRASOR showed good concurrent validity. The Static-99 scores correlated significantly ($p < .001$ each) with the scores of the SVR-20, SORAG and PCL-R: The correlation between the Static-99 and the SVR-20 was $r = .57$, between the Static-99 and the SORAG $r = .65$ and between the Static-99 and the PCL-R $r = .46$. The RRASOR scores correlated lightly lower but significant with the three instruments of comparison: The correlation between the RRASOR and the SVR-20 was $r = .33$ ($p < .001$), between the RRASOR and the SORAG $r = .43$ ($p < .001$), and between the RRASOR and the PCL-R $r = .22$ ($p < .05$).

Predictive Validity

The mean total scores of the Static-99 and the RRASOR for the 81 sex offender of the follow-up sample were 4.31 (SD = 2.45) and 2.10 (SD = 1.50), respectively. Regarding the Static-99, 16.1% (n = 13) of all sex offender were categorized into the low risk group (0-1 risk points), 19.8% (n = 16) medium low (2-3), 33.3% (n = 27) medium high (4-5), and 30.8% (n = 25) high. For the RRASOR, 16.0% (n = 13) had a score of 0, 23.5% (n = 19) of 1, 21.0% (n = 17) of 2, 22.2% (n = 18) of 3 and 8.6% (n = 7) each of 4 and 5⁴.

Figure 1 to 3 present the ROC Curves of the Static-99 and the RRASOR for general, sexual, and violent (including sexual) reoffending. Regarding the critical values for AUC of Cohen (1992; AUC > .70 = good; .65 < AUC ≤ .70 = moderate; AUC ≤ .65 = insufficient), the predictive validity of the Static-99 for general, sexual, and violent (including sexual) recidivism was good, whereas the predictive validity of the RRASOR for each kind of recidivism was moderate⁵ (see Table 2). The difference of the AUC values was significant for general (z = 2,27; p < .05) and violent (z = 2,23; p < .05), but not for sexual (z = 1,45; p = .15) recidivism.

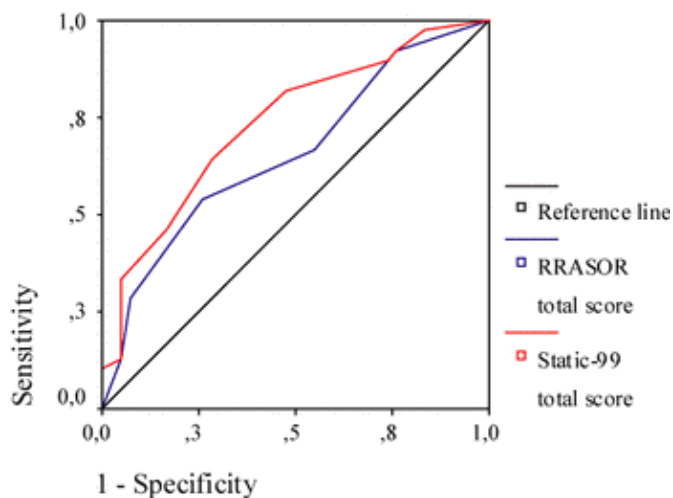
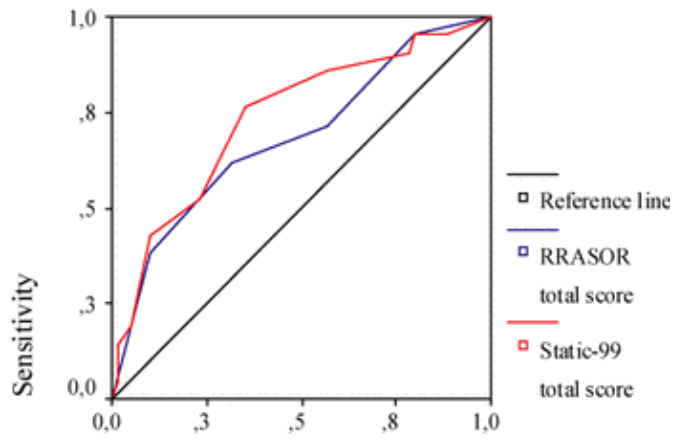
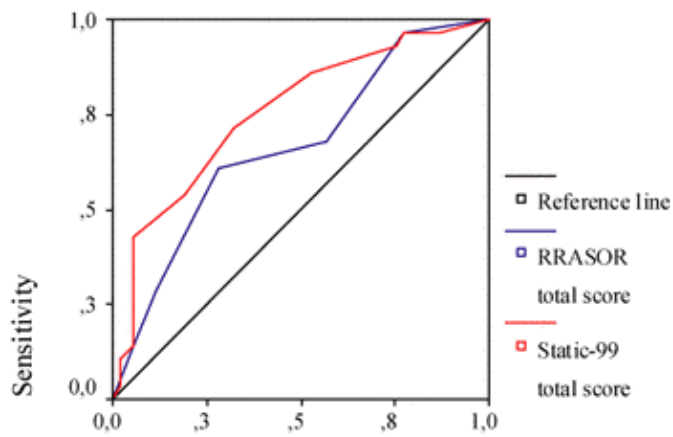


Figure 1: ROC curve of the Static-99 and the RRASOR for general recidivism.



1 - Specificity

Figure 2: ROC curve of the Static-99 and the RRASOR for sexual recidivism.



1 - Specificity

Figure 3: ROC curve of the Static-99 and the RRASOR for violent (including sexual) recidivism.

Table 2: Predictive validity of the Static-99 and the RRASOR

	General recidivism	Sexual recidivism	Violent (including sexual) recidivism
Static-99 Pearson correlation	.41**	.35**	.41**
Static-99 AUC	.74**	.74**	.76**
	.29*		.28*

RRASOR Pearson correlation		.30**	
RRASOR AUC	.66*	.68*	.67*
* $p < .05$ ** $p < .001$			

Discussion

The present study is the first one in Austria to assess the predictive validity of the Static-99 and the RRASOR. The base rates for general, sexual, and violent (including sexual) reoffending of this study are comparable to those found in international studies about sex offender recidivism (e.g. Hanson & Thornton, 1999). In order to calculate the predictive validity of the instrument, we developed a German version of the Static-99 (Rettenberger & Eher, 2006). This German version showed an excellent interrater reliability, and the concurrent validity of the instrument is comparable to results from other studies and can be interpreted as satisfactory. The results for interrater reliability for the RRASOR was lower but still very good. Furthermore even the RRASOR showed for concurrent validity results that are comparable to studies from North America (e.g. Barbaree et al., 2001); therefore these results can be interpreted as satisfactory, too.

The present study yielded good predictive validity for the Static-99 for each recidivism criterion. Although the instrument was originally designed to predict sexual and violent (including sexual) reoffenses, it turned out that the Static-99 also had significant predictive accuracy for general reoffending. With reference to the critical AUC values expressed by Cohen (1992) the predictive validity of the RRASOR can be interpreted as moderate. Regarding general and violent (including sexual) recidivism the results show that the predictive accuracy of the Static-99 is better than that one of the RRASOR. Although the AUC values of the Static-99 are higher than the AUC values of the RRASOR, the not significant difference regarding sexual recidivism indicates that they are equally accurate at predicting sexual reoffenses⁶. These results can be interpreted as a support of the opinion of Harris, Phenix, Hanson, and Thornton (2003): On the whole, if the information is available to score the Static-99 it is preferable to use the Static-99 over the RRASOR as estimates based on the Static-99 utilize more information than those based upon RRASOR score (p. 4). However, the performance of the RRASOR is remarkable: The predictive accuracy of the instrument depended on only four simply scored items, so the RRASOR is by far the easiest actuarial risk assessment tool to score (Barbaree et al., 2001). Even if actuarial risk assessment instruments like the Static-99 and the RRASOR cannot be recommended as stand-alone devices for risk assessment in clinical or legal practice (Sjöstedt & Långstrom, 2001)⁷, our data support previous claims that these instrument could serve as an initial baseline tool to guide decisions concerning sex offenders` need of further clinical evaluation and intervention. Therefore the results of our cross-validation study with an Austrian sample of sex offenders confirmed the results of previous studies from North America and Europe. Further research is still required on the performance of actuarial tools in different subpopulations of sex offenders. Regarding the recidivism risk of intrafamilial child molesters, some recent studies indicate that their risk of reoffense is actually higher than generally assumed, whereas actuarial risk assessment instruments like the Static-99 and the RRASOR categorize intrafamilial child molesters mostly as low-risk-offender (Studer, Clelland, Aylwin, Reddon, & Monro, 2000; Eher & Ross, 2006). Our sample was too small to answer this question. Furthermore the data showed that the majority of the sex offenders in our study are a high-risk group⁸, so this sample is not representative for all Austrian sex offenders. Future research will have to include more representative samples of sex offenders and will have to focus on the predictive validity of these instruments in different subgroups of sex offenders.

Regardless of the discussion which sex offender risk assessment approach (actuarial vs. clinical) is the better way to evaluate the recidivism risk (e.g. Berlin, Galbreath, Geary, & Mclone, 2003; Boer, 2006), our results support the utility of the RRASOR and particularly the Static-99 in Austria. Because of the higher predictive accuracy of the Static-99 compared with the RRASOR, we recommend to prefer the Static-99 in evaluating sex offender recidivism risk.

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Footnotes

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² Therefore it was not possible in this study to examine the predictive accuracy of the SVR-20, SORAG, and PCL-R; the quality of the available files of our follow-up sample was not sufficient for scoring more elaborate instruments like SVR-20, SORAG or PCL-R.

³ For the purposes of a Static-99 assessment a sexual offense is an officially recorded sexual misbehaviour or criminal behaviour with sexual intent (Harris, Phenix, Hanson, & Thornton, 2003). You can find exact definitions of the different kind of sexual offenses and a list of paragraphs of the

Austrian and German criminal codes in the German version of the manual of the revised version of the Static-99 (for IATSO-members available from: http://www.iatso.org/iatso_user_tool/publications)

⁴ These distributions of scores differ from validation studies from North America (e.g. Hanson & Thornton, 1999; Barbaree et al., 2001), but are comparable with other European studies (e.g. de Vogel et al., 2004; Stadtland et al., 2005).

⁵ De Vogel, de Ruiter, van Beek, and Mead (2004) use with reference to Douglas (2001) the following interpretation of critical AUC values: AUC of .70 and above are considered moderate, and above .75 good.

⁶ However, the results of the Static-99 and the RRASOR regarding sexual recidivism can be interpreted as an advice of a better predictive accuracy of the Static-99; it has to be assumed that one reason for the not significant result is the small sample size.

⁷ Sjöstedt and Långström (2001) explain that the validity of instruments like the Static-99 or the RRASOR is still too low to recommend either model to be used as stand-alone devices for risk assessment in clinical or legal practice: We maintain that they should be used only with extreme caution outside of the research context, and only if properly supplemented with other (nonactuarial) approaches (p. 640). One reason for that is the clinical need for dynamic risk factors, another one are legal requirements of risk assessment in the German-speaking part of Europe regarding actuarial methods in common (e.g. Dahle, 2005).

⁸ It can be speculated that the persons in charge of aftercare operations programs for sex offenders selected mainly high risk offenders for their treatment programs. The subjects of this study attended treatment programs of an Austrian aftercare operations institution, so it is possible that these sex offenders are also part of a high risk group.

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