
Cross-Validation of the Risk Matrix 2000 Sexual and Violent Scales

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The predictive accuracy of the newly developed actuarial risk measures Risk Matrix 2000 Sexual/Violence (RMS, RMV) were cross validated and compared with two risk assessment measures (SVR-20 and Static-99) in a sample of sexual ($n = 85$) and nonsex violent ($n = 46$) offenders. The sexual offense reconviction rate for the sex offender group was 18% at 10 years follow-up, compared with 2% for the violent offenders. Survival analyses revealed the violent offenders were reconvicted at twice the rate compared to sexual offenders. The RMV significantly predicted violent recidivism in the sex and combined sex/violent offender groups. Although the RMS obtained marginal accuracy in predicting sexual reconviction in the sex offender group, none of the scales significantly predicted sexual reconviction. An item analysis revealed four factors not included in the risk scales that were significantly correlated with sexual and violent reconviction. Combining these factors with Static-99, RMV, and RMS increased the accuracy in predicting sexual reconviction.

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Forensic practitioners working with sexual offenders are under increasing pressure to accurately assess levels of risk and to make the decision-making process more transparent. When released into the community, sex offenders deemed as presenting a high risk of reoffending are often subject to substantially more restrictions than compared to those deemed at low risk of reoffending. To this extent, risk assessment is the cornerstone of effective offender management (Andrews & Bonta, 1998), and the identification of the risks posed by offenders and factors associated with recidivism are crucial to the identification of appropriate and effective interventions designed to reduce the risk of recidivism.

The predictive accuracy of clinical judgment and actuarial measures has been debated (Grubin, 1999; Harris, Rice, & Cormier, 2002), and it is widely accepted that actuarial risk measures outperform clinical judgment (Bonta, Law, & Hanson, 1996; Hanson & Bussière, 1996; Hanson & Morton-Bourgon, 2004; McNeil, Sandberg, & Binder, 1998). Goggin (1994) found the mean correlation coefficient for prediction of recidivism using actuarial methods was .22 whereas for clinical methods it was .08. Grove, Zald, Lebow, Snitz, and Nelson (2000) found that mechanical-prediction techniques were about 10% more accurate than clinical predictions, and depending on the specific analysis, mechanical prediction substantially outperformed clinical prediction in 33% to 47% of studies examined. In a study of 192 sexual offenders, Hood, Shute, Feilzer, and Wilcox (2002) examined the risk assessment procedures of parole boards in the U.K. between 1992 and 1994. Although they found that clinical prediction did quite well at identifying high-risk offenders, during a 6-year follow-up they found that Static-99 (Hanson & Thornton, 2000; a description of Static-99 can also be found on the Solicitor General of Canada's Web site: www.sgc.gc.ca/epub/corr/e199902/e199902.htm) was better at predicting sexual reconviction than compared to clinical judgment. Using the area under the curve (AUC) of the receiver operating characteristic¹ (ROC) analysis they reported AUC of .77 for actuarial measures and AUC of .32 for clinical judgment (A. Wilcox, personal communication, September 16, 2002).

However, actuarial measures are not without their critics. Litwack (2001), Rogers (2000), and Silver and Miller (2002) urged caution over the uncritical acceptance of actuarial measures. In offering a critique of the actuarial movement, and of the Violent Risk Appraisal Guide (VRAG; Quinsey, Harris, Rice, & Cormier, 1998; Rice & Harris, 1997) in particular, Litwack argued that research to date has not demonstrated that actuarial methods of risk assessment

are superior to clinical methods because most clinical determinations of dangerousness are not “predictions” of violence; and it is very difficult to compare clinical and actuarial assessments of *dangerousness*. In response, Harris et al. (2002) compared the predictive accuracy of clinical judgment with that of the VRAG on a sample of forensic psychiatric patients and found VRAG performed significantly better at predicting violent recidivism during a 6-month period (AUC = .80) than did clinical judgment (AUC = .70) and made fewer false alarms over a 1-year follow-up.

Actuarial measures have also been criticized for being atheoretical, and having limited applicability to diverse groups or populations. In a review of sex offender risk measures, Craig, Browne, and Stringer (2003a) reported that 10 of 12 risk measures examined were better at predicting general offense recidivism than predicting sexual offense recidivism. Area-under-the-curve indices ranged from .60 for Multifactorial Assessment of Sex Offender Risk for Recidivism (MASORR; Barbaree, Seto, Langton, & Peacock, 2001) and VRAG, to AUC = .92 for Static-99 (see Thornton, 2002). However, such differences between studies may be expected with variations in sample characteristics and base rates. Indeed, base rates are inherently ambiguous, unreliable, and unstable (Koehler, 1996) and vary depending on whether they are based on official or unofficial sources, and the definitions used such as *reconviction*, *recidivism*, *rearrest*, or *reoffending* (Falshaw, Bastes, Patel, Corbett, & Friendship, 2003; Marshall & Barbaree, 1988). Base rates differ between *ages*, and *sex offender subgroups* (Hanson, 2002). For example, the base rate for rapists (17.1%) is higher than that of intrafamilial offenders (8.4%) but less than that of extrafamilial offenders (19.5%). Rapists were more than twice as likely to commit any kind of offense than child molesters but did not differ in their likelihood to commit a new serious offense (Serin, Mailloux, & Malcolm, 2001; Seto & Barbaree, 1999). It is well documented that base rates will increase with time (Hanson, 2002; Prentky, Lee, Knight, & Cerce, 1997) and vary between sexual recidivism studies from .10 to .40 (Barbaree, 1997). The probability of overestimating the risk (predicting an offender will reoffend when they did not—false positive prediction) is increased when the base rate is low. Conversely, raising the base rate increases the probability of underestimating the risk (predicting offenders will not reoffend when in fact they did—a false negative prediction). Indeed, with a base rate of 4%, Hood et al. (2002) reported that Static-99 overestimated risk 49 times of 50, and Craissati (2003) found that with a base rate of 2%, Static-99 and Risk Matrix 2000/Sexual (RMS; Thornton et al., 2003) over-predicted risk 29 times of 30.

The extent to which actuarial risk measures can be applied to diverse groups or populations has also been questioned. Bartosh, Garby, Lewis, and Gray (2003) investigated the predictive utility of Static-99, the Rapid Risk Assessment for Sexual Offense Recidivism (RRASOR; Hanson, 1997), the Minnesota Sex Offender Screening Tool–Revised (MnSOST-R; Epperson, Kaul, & Hesselton, 1998), and the Sex Offender Risk Appraisal Guide (SORAG; Quinsey et al., 1998) in predicting sexual recidivism and found that the effectiveness of each instrument varied depending on offender type. The Static-99 and SORAG were significantly predictive of sexual, violent, and any recidivism for extrafamilial child molesters, and all four tests were predictive of violence or any recidivism in this subgroup. For incest offenders, all four tests were at least moderately predictive of sexual recidivism, whereas Static-99 and the SORAG were highly predictive of violence or any recidivism. None of the four tests established consistent predictive validity across recidivism categories in regard to rapists or noncontact offenders; however, the Static-99 and SORAG scales were significant in terms of sexual recidivism.

Nevertheless, according to Monahan (1996), prediction can be improved with the use of actuarial methods by using criteria that have been empirically validated, therefore increasing the validity of the decision-making process. Indeed, in recent years the literature witnessed a surge in empirically derived risk measures, many of which have not been empirically validated.

In a recent development in actuarial measures, Thornton et al. (2003) reexamined the Structured Anchored Clinical Judgment Scale (SACJ; see Grubin, 1998; Hanson & Thornton, 2000) and created a two-dimensional risk assessment system for sex offenders referred to collectively as *Risk Matrix 2000*. The revised system has two scales, one for measuring risk of sexual recidivism—Risk Matrix 2000/Sexual (RMS), and one for measuring risk of non-sexual violent recidivism—Risk Matrix 2000/Violent (RMV) in sexual offenders, both of which are widely used in the British Prison and Probation Services. The RMS and RMV scales were constructed to yield four summary risk categories: low, medium, high, and very high risk. The scores of RMS and RMV can be combined to give a composite risk of reconviction for sexual or nonsexual assaults—Risk Matrix 2000/Combined (RMC).

The Risk Matrix 2000 scales use a stepwise approach to scoring. In developing the RMS, the Hanson and Bussière (1998) meta-analysis was considered as a more complete guide to the literature, containing more precise and representative estimates of the predictive accuracy of individual factors than would be obtained from any individual study. The RMS has three risk items in Step 1 (number of previous sexual appearances, number of criminal appearances, and age), the sum of which is translated into a risk

category. Step 2 considers four aggravating risk factors (any conviction for sexual offense against a male, any conviction for a sexual offense against a stranger, any conviction for a noncontact sex offense, and single–never been married), the presence of two or four aggravating factors raises the risk category by one or two levels respectively. Thornton et al. (2003) validated the RMS on two U.K. samples, treated ($n = 647$) and untreated ($n = 429$) sex offenders and obtained AUC of .77 and .75, respectively, in predicting sexual reconviction. The RMV variables were selected on a priori grounds for inclusion and include age on release, amount of prior violence, and a history of burglary. Validated on two samples followed-up over 10 years ($n = 311$) and between 16 and 19 years ($n = 429$), RMV obtained AUC of .78 and .80, respectively, in predicting nonsexual violent reconviction.

However, the validity of the Risk Matrix 2000 scales remains in question as there have been few cross-validation studies using the RMS and RMV scales. Craig, Browne, and Stringer (2004a) considered empirically the application of sex offender risk assessment measures on offenders with adult or child victims on six risk measures; RMS, RMV, RRASOR, Static-99, Sexual Violence Risk-20 (SVR-20; Boer, Hart, Kropp, & Webster, 1997), and SACJ-Min (a shortened version of SACJ; Hanson & Thornton, 2000) on 139 sex offenders. Levels of risk of sexual offenders with child and adult victims varied. Offenders with adult victims obtained significantly higher mean scores using the RMS and SACJ-Min than did sex offenders with child victims who obtained significantly higher scores on the RRASOR. Offenders with adult victims were more likely to be considered medium-high to high risk using Static-99 and SACJ-Min, respectively, whereas offenders with child victims were more likely to obtain scores in the low- to medium-low risk categories using the RMS. Sex offenders referred to a Regional Secure Unit (RSU) scored significantly higher on RRASOR and RMS than did sex offenders supervised by the Probation Service.

The purpose of the current study was to cross-validate the accuracy of the newly developed risk measures *RMS* and *RMV* compared against two other risk measures (Static-99 and SVR-20) in predicting sexual and nonsexual violent reconviction.

Method

Measures

The Static-99 and SVR-20 risk assessment measures were selected to compare the relative accuracy of the RMS and RMV scales in predicting

sexual and nonsex violent reconviction. The RRASOR and SACJ-Min scales were excluded from this study as Static-99 was derived from RRASOR and SACJ-Min, and RMS and RMV scales were derived from SACJ-Min scale.

Static-99 (Hanson & Thornton, 2000). Static-99 was developed from combining SACJ-Min and RRASOR and was based on four diverse data sets, three of which were used to develop RRASOR. It contains 10 items concerned with four broad categories associated with increased likelihood of committing further sexual offenses: sexual deviance measured by whether the offender has offended against males, ever been married, and has committed a noncontact sexual offense; range of potential victims measured by whether the offender offended against unrelated or stranger victims; persistent sexual offending measured by number of previous sexual convictions; and antisociality as measured by current or previous nonsexual violence or four or more previous criminal convictions, and age under 25 years. Static-99 (AUC = .71, $r = .33$) was more accurate than the RRASOR (AUC = .68, $r = .28$) or SACJ-Min (AUC = .67, $r = .23$) in predicting sexual recidivism and also showed moderate predictive accuracy for violent (including sexual) offense recidivism (AUC = .69, $r = .32$). Sjöstedt and Långström (2000) reported AUC of .76 for sexual recidivism and .74 for nonsexual violent recidivism using Static-99. Similarly, Thornton and Beech (2002) reported AUC = .91 for sexual recidivism using Static-99 followed up to 6 years, whereas Friendship, Mann, and Beech (2003) reported AUC of .70 for sexual reconviction and sexual and/or violent reconviction during a 2-year follow-up. These scores are consistent with Barbaree et al. (2001) and Thornton (2002). Nunes, Firestone, Bradford, Greenberg, and Broom (2002) reported AUC of .70 and .69 for sexual and sexual and/or violent reconviction, respectively, using Static-99.

SVR-20 (Boer, Hart, et al., 1997). The SVR-20 is a clinically guided checklist designed to assess risk for sexual violence recidivism in sexual offenders. It consists of 20 items divided into three risk factor domains: sexual offenses, psychosocial adjustment, and future planning. The SVR-20 items are rated not present, somewhat or possibly present, or clearly present, and the overall pattern is considered to form a global structured professional judgment of low, medium, or high risk of sexual recidivism. In developing the measure, the authors stated that the SVR-20 should be used as a guided clinical measure and not as an actuarial instrument as the measure offers a more ideographic approach to risk assessment. In the current study, we established an SVR-20 total score based on transformations of the no, maybe/sometimes,

and yes categories into 0, 1, or 2 for each item. This method for converting the SVR-20 items into scores was described by Sjöstedt and Långström (2002) in their study of 51 rapists from Sweden. Sjöstedt and Långström reported AUC of .49 and .64 for sexual and nonsexual violent recidivism, respectively, for total SVR-20 scores. Dempster (1999) examined the predictive accuracy of the SVR-20 against that of the VRAG, SORAG, RRASOR, and Psychopathy Checklist–Revised (PCL-R; Hare, 1991) and found that only the RRASOR and SVR-20 were able to distinguish recidivists who were sexually violent from recidivists who were generally violent.

Participants

Of the 250 offenders identified for inclusion in the current study, 87 were excluded because of limited personal history information, and 22 general offenders were excluded who had no convictions for sexual or violent offenses. Of the 141 offenders, 10 were not identified in the reconviction data. The sample consisted of 131 offenders, 85 sexual offenders (mean age = 37.2 years, $SD = 13.3$, range = 15 to 74 years), and 46 nonsex violent offenders (mean age = 27.8 years, $SD = 8.2$, range = 16 to 56 years). The sample was split into one of two categories based on their most recent conviction and offense history. Sexual offenders were classified as having committed a contact sexual offense (rape, attempted rape, indecent assault, gross indecency) either current conviction or previous conviction at the time of the assessment. Offenders who had a history of a previous sexual conviction were scored as sexual offenders even though their index offense may have been nonsexual. Nonsex violent offenders were classified as having committed a violent offense (actual or grievous bodily harm, murder, manslaughter, wounding, and common assault) and having no history of sexual offenses or sexual element to their offending.

Setting

The participants were convicted offenders referred to a U.K. RSU for assessment as outpatients between 1992 and 1995. The RSU is a forensic psychiatric facility that holds medium-risk adult psychiatric patients and offenders who are mentally disordered. The RSU provided an outpatient assessment resource for local agencies dealing with offenders who are nonmentally disordered from which this sample was taken. The RSU also coordinated an outpatient sex offender treatment program for offenders who were nonmentally disordered referred from local agencies. The risk assessment

measures used in the current study were completed using the assessment protocols and psychology assessment reports held by the RSU.

Reconviction Data

Official reconviction rates (i.e., U.K. government crime statistics) were calculated using data from the Home Office Offenders Index (OI). Reconviction data were collected in January 2003, from the OI, allowing an average follow-up period of 8 years 7 months ($SD = 9.5$ months, range = 5 years 6 months to 10 years 3 months). This was calculated from the date of the original assessment at the RSU to January 2003. Of the 85 sexual offenders, 86% ($n = 73$) were followed up at 8 years, 49% ($n = 42$) at nine years, and 4.7% ($n = 4$) at 10 years. Of the 46 nonsex violent offenders, 87% ($n = 40$), 4% ($n = 20$) were followed up at 8 and 9 years, respectively.

The risk categories for the risk measures were submitted to the receiver operating characteristic (ROC) analysis (Mossman, 1994) using the SPSS (2000) software. The ROC analysis is the preferred indices used to evaluate the predictive accuracy of a risk assessment tool using the AUC (Harris, 2003). The ROC analysis is not distracted by variations in the base rate of recidivism and can be interpreted as the probability that a randomly selected recidivist would have a more deviant score than a randomly selected nonrecidivist. In examining the effects sizes of many variables, Cohen (1988) considered $d = .20$ a small effect, $.50$ a moderate effect, and $.80$ a large effect. These would correspond to AUC indices of approximately $.56$, $.65$, and $.72$, respectively (R. K. Hanson, personal communication, February 5, 2004).

Results

Survival and Reconviction Rates

The OI revealed that 65 (50%) of the sample of 131 offenders were reconvicted during the follow-up period. Of the sample, 16 (12%) offenders were reconvicted of a sexual offense, 21 (16%) reoffended violently, and 28 (21%) reoffended in a nonsex and/or nonviolent manner (Table 1). Of the 85 sexual offenders, 6 (7%), 10 (12%), and 15 (18%) were reconvicted of a sexual offense in the three follow-up periods compared to 1 (2%) of the violent offender group. Survival rates of the two groups are reported in Figure 1. Violent offenders (74% at 10 years) were reconvicted at twice the rate of the sexual offender group (36% at 10 years).

Table 1
Distribution of Offender and Offense Recidivism
Patterns (percentages in parentheses)

Offender Group	Recidivism		
	Sexual Offense	Violent Offense	Nonsex and/or Nonviolent Offense
2-year follow-up			
Sexual offender	6 (7.1)	4 (4.7)	6 (7.1)
Violent offender	1 (2.2)	6 (13.0)	11 (23.9)
5-year follow-up			
Sexual offender	10 (11.8)	8 (9.4)	6 (7.1)
Violent offender	1 (2.2)	11 (23.9)	17 (37.7)
10-year follow-up			
Sexual offender	15 (17.6)	8 (9.4)	8 (9.4)
Violent offender	1 (2.2)	13 (28.3)	20 (43.5)

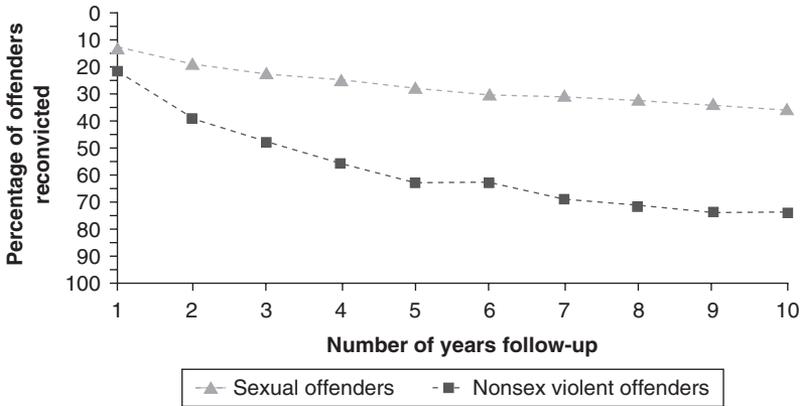
Predictive Accuracy

The RMS and RMV scales consistently obtained the highest AUC indices for predicting sexual recidivism over the 2-, 5-, and 10-year follow-up periods compared with the other risk measures (Table 2). Although the RMV obtained moderate predictive accuracy for sexual recidivism, scores for predicting violent recidivism peaked at AUC = .87 at 2 years, and .86 at 5- and 10-year follow-up periods. Combining the sex and nonsex violent offender groups generally had a negative effect on predictive accuracy. With the two groups combined, the RMS obtained lower AUC indices in predicting sexual recidivism and had a similar effect on the accuracy of the RMV in predicting violent recidivism.

Predicting Recidivism

The reliability estimates of the risk assessment measures were calculated using Pearson *r* between risk scores and recidivism outcome (Table 3). Consistent with having the largest AUC indices, the RMV significantly predicted violent, sexual and/or violent, general, and any recidivism during the follow-up period. The RMS significantly predicted any offense during 2, 5, and 10 years, and sexual and/or violent recidivism during 5 and 10 years, and violent recidivism at 10 years. None of the risk measures significantly predicted sexual recidivism.

Figure 1
Survival Analysis for Sexual and Nonsex Violent Offender Groups



An item analysis of 24 risk items not currently considered by Static-99, RMS, or RMV revealed four risk factors positively correlated with sex and violent reconviction during the follow-up periods: history of foster care ($r = .19, p < .05$), history of substance abuse ($r = .18, p < .05$), history of employment problems and/or instability ($r = .20, p < .05$), and history of school maladjustment ($r = .30, p < .001$). These items were factored with the Static-99, RMS, and RMV scales. Factoring the four risk items increased the strength of correlation between the RMV and sexual and/or violent, general, and any reconviction of the three follow-up periods, peaking at $r = .52$ ($p < .01$) for violent reconviction (Table 3). Factoring the four risk items with Static-99 and RMS also increased the correlation strength with sexual and/or violent, general, and any reconviction. Little effect was found in correlating with sexual reconviction.

However, factoring the four risk items with RMS had a positive effect in predicting sexual reconviction (AUC = .71 at 2 years, .74 at 5 years, .62 at 10 years; Table 4). A similar effect was also found with Static-99, although this was less marked. Although the RMV continued to obtain moderate accuracy in predicting violent reconviction in the sexual offender group and combined sex and/or violent offender group, the effect of factoring four risk items had a depressing effect on the AUC indices.

Table 2
Areas Under the Curve (AUC) Indices for Risk Scales
in a Sample of Sexual and Violent Offenders

	Risk Measures							
	Static-99		SVR-20		RMS		RMV	
Offense Reconviction	SO	SV	SO	SV	SO	SV	SO	SV
2 year follow-up								
Sexual	.57	.52	.46	.47	.60	.57	.66	.54
Violent	.57	.62	.72	.59	.54	.58	.87	.75
Sexual and violent	.58	.58	.57	.54	.58	.58	.76	.67
General	.51	.57	.74	.67	.54	.62	.66	.70
Any reconviction	.53	.59	.65	.62	.57	.62	.75	.72
5-year follow-up								
Sexual	.59	.53	.48	.50	.68	.59	.68	.51
Violent	.69	.60	.54	.53	.64	.62	.86	.75
Sexual and violent	.62	.61	.52	.53	.65	.63	.76	.70
General	.43	.55	.66	.70	.49	.63	.64	.71
Any reconviction	.58	.62	.57	.64	.62	.67	.76	.77
10-year follow-up								
Sexual	.52	.50	.51	.49	.59	.55	.65	.53
Violent	.69	.66	.54	.56	.64	.68	.86	.84
Sexual and violent	.60	.60	.52	.53	.62	.62	.74	.71
General	.51	.58	.63	.65	.55	.63	.69	.72
Any reconviction	.57	.61	.54	.62	.61	.66	.75	.76

Note: SVR-20 = Sexual Violence Risk-20; RMS = Risk Matrix 2000/Sexual; RMV = Risk Matrix 2000/Violent; SO = Sexual offender group (*N* = 85), SV = Sex and violent offender groups combined (*N* = 131).

Discussion

The purpose of the current study was to cross validate the accuracy of the RMS and RMV compared with that Static-99 and SVR-20. The results from the current study support the use of RMS and RMV as risk-assessment measures in predicting sexual and nonsex violent reconvictions.

The nonsex violent offenders were reconvicted at twice the rate than the sexual offender group for nonsexual offenses. This is consistent with other studies who have reported high reoffense rates for nonsexual crimes (Elliot, 1994; Kahn & Chambers, 1991; Sipe, Jensen, & Everett, 1998; Taylor, 2003;

Table 3
Correlations Between Reconviction Outcome and Risk Measures

Risk Measures	2 Years				5 Years				10 Years			
	Sexual and Violent		Any Offense		Sexual and Violent		Any Offense		Sexual and Violent		Any Offense	
	Sexual	Violent	General	Offense	Sexual	Violent	General	Offense	Sexual	Violent	General	Offense
Static-99	.01	.10	.09	.14	.02	.12	.17	.21*	.00	.21*	.16	.19*
SVR-20	-.03	.05	.02	.17	-.02	.04	.03	.24**	-.00	.08	.06	.18*
RMV	.00	.22*	.17*	.34**	-.02	.32**	.28**	.48**	.00	.44**	.32**	.46**
RMS	.05	.08	.10	.18*	.08	.14	.19*	.28**	.05	.21*	.18*	.26**
Static-99 + 4	.05	.14	.14	.25**	.02	.19*	.24**	.37**	.00	.31**	.25**	.35**
RMV + 4	.02	.21**	.19*	.37**	-.01	.31**	.29**	.53**	-.00	.52**	.34**	.45**
RMS + 4	.09	.011	.015	.30**	.08	.19*	.24**	.45**	.04	.30**	.26**	.30**

Note: SVR-20 = Sexual Violence Risk-20; RMS = Risk Matrix 2000/Sexual; RMV = Risk Matrix 2000/Violent; +4 factors = history of substance abuse, history of employment problems/instability, school maladjustment, and history of foster care.

Combined sex and violent offender groups (N = 131).

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

Table 4
Area Under the Curve (AUC) Indices for Risk Scales
With Additional Risk Items Factored

	Risk Measures					
	Static-99 + 4		RMS + 4		RMV + 4	
	SO	SV	SO	SV	SO	SV
Offense Reconviction						
2-year follow-up						
Sexual	.62	.58	.71	.63	.70	.58
Violent	.61	.65	.62	.62	.84	.73
Sexual and violent	.62	.63	.68	.63	.77	.68
General	.56	.64	.59	.68	.66	.70
Any reconviction	.61	.66	.66	.68	.75	.73
5-year follow-up						
Sexual	.61	.55	.74	.60	.65	.53
Violent	.59	.65	.69	.64	.76	.73
Sexual and violent	.68	.66	.72	.67	.78	.71
General	.54	.66	.60	.75	.65	.76
Any reconviction	.66	.72	.72	.77	.78	.80
10-year follow-up						
Sexual	.57	.51	.62	.55	.66	.53
Violent	.70	.73	.69	.73	.85	.83
Sexual and violent	.66	.65	.68	.66	.75	.71
General	.59	.68	.63	.73	.69	.75
Any reconviction	.65	.70	.69	.75	.76	.78

Note: SVR-20 = Sexual Violence Risk-20; RMS = Risk Matrix 2000/Sexual; RMV = Risk Matrix 2000/Violent; SO = Sex offender group (*n* = 85); SV = Sex and violent offender groups combined (*N* = 131); + 4 factors = history of substance abuse, history of employment problems/instability, school maladjustment, and history of foster care.

Weinrott, 1996). The overall reconviction rate for the sample of sexual offenders was lower than that of the violent offender sample. However, the sexual reconviction rate for the sex offender group was higher than that of the violent offender group. These rates are consistent with recent research (Caan, Falshaw, & Friendship, 2004).

For the most part, combining sexual and violent offender groups negatively affected the predictive accuracy of some risk assessment measures. The RMV consistently obtained moderate accuracy in predicting violent, sexual and/or violent, general, and any reconviction across the three follow-up periods. In respect of Static-99, the results reported in the current study are inconsistent with that of the literature. Barbaree et al. (2001) reported

AUC = .70 for sexual and serious recidivism, whereas Nunes et al. (2002) reported slightly lower AUC scores of .61 and .62 for sexual and sexual and/or violent recidivism, respectively. In an evaluation of a national sex offender treatment program, Friendship et al. (2003) used Static-99 to assess risk and reported AUC = .70 in predicting sexual and sexual and/or violent reconviction. The current study reported an AUC = .57 for sexual and violent reconviction at 2-year follow-up. Static-99 was better at predicting violent reconviction than sexual conviction in sexual and combined sexual and/or violent samples. However, in respect of the SVR-20, the results are consistent with that of Sjöstedt and Långström (2002) who reported AUC = .64 for nonsexual violent recidivism and AUC = .49 for sexual recidivism for the SVR-20. The current study reported AUC = .72 for nonsexual violent reconviction and .46 for sexual reconviction.

Factoring additional risk items had a positive effect on the accuracy of the RMS (AUC = .71 at 2 years, .74 at 5 years, and .62 at 10 years) and Static-99 (AUC = .62 at 2 years, .61 at 5 years, and .57 at 10 years) in predicting sexual reconviction; however, this effect was not significantly correlated. The four additional risk items had a negative effect on accuracy in the RMV in predicting violent reconviction.

Methodological Problems

Inconsistencies in the current study's findings with that of previously published results may be accounted for by a number of explanations. In the current study, official reconviction rates were calculated using data from the Home OI. This only records whether the offender was reconvicted and of what offense and does not record rearrest data or victim characteristics. Official sources are known to underreport recidivism (Falshaw, Bastes, Patel, Corbett, & Friendship, 2003; Marshall & Barbaree, 1988). A further confound when using official sources is that serious sexual offenses are often "bargained down" to violent offenses to secure convictions (Bagley & Pritchard, 2000), to the point where 12% of violent reconvictions are sexually motivated (Corbett, Patel, Erikson, & Friendship, 2003). Indeed, in 10 of 19 rape cases reported in the United Kingdom the sexual element of the crime was removed and downgraded to a violent offense (Lees, 1996). It is possible that violent convictions may mask the true motivation of the offense. The OI does not record whether the offenders attended a sex offender treatment program during their incarceration which is known to affect sexual recidivism (Craig, Browne, & Stringer, 2003b; Hanson, Gordon, et al., 2002). The sample in the current study was referred to an RSU for assessment by

local agencies such as probation areas. It is not clear why they were referred; however, it is possible this sample may hold unusual risk characteristics compared to offenders usually supervised by probation. Indeed, Cohen (1981) argued that any comparisons between an individual's level of risk and "base rate" data should be ignored unless all relevant characteristics between the offender and the sample base rate are shared. Variations in base samples used in developing the risk scales may account for the variability of predictive accuracy of risk measures (Craig et al., 2003a; Craig, Browne, & Stringer, 2004b). Although the process of factoring four risk items had a positive effect in predicting sexual reconviction, it should be noted that these factors are not acute dynamic risk factors but rather are static risk factors that describe dynamic instability. Because of the relatively small sample size, caution should be exercised over the generalizability of these results.

Nevertheless, several authors have considered additional risk factors such as pro-offending attitudes (Hudson, Wales, Bakker, & Ward, 2002) and other dynamic measures (Dempster & Hart, 2002; Thornton, 2002) that have increased predictive accuracy when combined with static risk factors. Beech and colleagues have found the identification and measure of deviancy in child molesters can significantly increase actuarial predictive accuracy (Beech, 1998; Beech, Erikson, Friendship, & Ditchfield, 2001; Beech, Fisher, & Beckett, 1999; Beech, Friendship, Erikson, & Hanson, 2002). Thornton and Beech (2002) examined the extent to which psychological deviance (using the Structured Risk Assessment system, Thornton, 2002; and psychometric indicators, Beech et al., 2002) predicts sexual recidivism compared with Static-99. The two systems of deviance assessment were standardized from which the number of dysfunctional domains could be calculated. They compared the accuracy of the deviancy assessments and Static-99 on two samples of sex offenders and found that as a predictor of sexual recidivism the number of dysfunctional domain obtained moderate accuracy (AUC ranging from .83 to .85) compared with Static-99 (AUC ranging from .91 to .75). In both samples, the number of dysfunctional domains made a statistically significant independent contribution to prediction over and above Static-99 risk category. Analysis of the combined samples confirmed that Static-99 and the number of dysfunctional domains allowed better prediction than either factor alone.

The results from the current study share similarities with that of Hanson and Morton-Bourgon's (2004) meta-analysis, which found that, among other factors, sexual deviance, any substance abuse, and employment instability significantly predicted sexual recidivism. Similarly, Craissati (2003) examined

reconviction data on 310 sexual offenders over a 4-year period using actuarial measures combined with sexual risk behavior (SRB) factors. These included any offense with a sexual element, the targeting of victims, and any behavior associated with the index offense. For the sample of rapists, the AUC increased from .71 to .85 when considering Static-99 (with risk factors, physical abuse during childhood, and a history of two or more childhood disturbances), and Static-99 plus SRB factors. For the child molesters, the AUC decreased from .78 to .68 when considering Static-99 (with risk factors, victim of childhood sexual abuse), and Static-99 with SRB factors. It was also found that breach of license conditions or treatment failure were not predicted by offense characteristics. Research into actuarial predictors of sex offender subgroups, extent and severity of violence combined with dynamic factors are likely to further advance our knowledge of sexual reoffending.

Future Research

The pattern of results from the RMV suggests that it measures facets of behavior different to that of sexual offending, in terms of deviant sexual interest and appetite, but consistent with other aspects of sexual recidivism such as nonsexual violence and so on. It is not clear to what extent levels of violence were displayed during the commission of a sexual assault. This may go some way to explain why the RMV obtained higher AUC indices for predicting sexual reconviction than did some of the other risk measures exclusively for sex offenders. This contention is supported by Doren (2002) who argued that sexual offending may consist of two underlying drives toward sexual recidivism: deviant sexual interests and antisocial and/or violent personality characteristics. He argued that the actuarial measures RRASOR and Static-99 may actually measure different aspects of sexual and violent offending. The RRASOR has correlated with paraphilias but not the PCL-R, whereas the Static-99 has correlated with the PCL-R, VRAG, and the personality disorders. Similarly, phallometric measures of deviant sexual interests do not show increased predictive accuracy when added to RRASOR scores but do show increased predictive accuracy when added to Static-99 scores (Doren, 2002; Roberts, Doren, & Thornton, 2002). This offers support for the use of the Risk Matrix 2000 scales where the RMV was designed to measure nonsexual violence in sexual offenders, and the RMS was designed to measure sexual recidivism in sexual offenders.

Given the evolutionary development, it was expected that the more recently developed risk measures such as the RMS would outperform the

older instruments such as Static-99. However, factoring risk items with static-based actuarial risk measures can improve predictive accuracy. Common among most measures are static factors, including prior criminality (Proulx, Pellerin, McKibben, Aubut, & Ouimet, 1997), prior sexual offenses (Hanson & Bussière, 1998; Hanson, Scott, & Steffy, 1995), psychopathy or personality disorder (Hanson & Harris, 2000; Rice, Harris, & Quinsey, 1990; Serin et al., 2001; Seto & Barbaree, 1999; Worling, 2001), age and time spent in custody (Broadhurst & Maller, 1992; Browne, Foreman, & Middleton, 1998), paraphilias, and deviant sexual interests (Hanson & Bussière, 1998; Hanson & Morton Bourgon, 2004), all of which have been positively related to sexual reoffending.

Note

1. The receiver operating characteristic (ROC) analysis plots the “hit rate” against the “false alarm rate” to produce a curve from which the hit rate can be calculated as a function of the false alarm rate. The trade-off between the hit rate and the false alarm rate is called the receiver operating characteristic. A perfectly accurate test would yield an ROC—the hit rate of 1.0 (no overlap between recidivists and nonrecidivists) and .50 indicating prediction no better than chance.

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