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ABSTRACT

In order to assess the internal structure of Risk Matrix 2000 in an Italian sample of 308 adult males convicted for sex abuse, a principal component analysis with Promax rotation was performed. The results identified a structure with three factors that explained 53.8% of the total variance: the first factor concerned items referred to the criminal career of the offender; the second factor concerned the age of onset in committing crimes; the third factor was more strictly related to the offenders' attitude towards the sex crime/s, and reflects the aggravating items of the S scale. These results allows us to have the first validated tool on an Italian sample for assessing the level of risk for recidivism.

Introduction

In the last 20 years, there has been an expansion of international research in the field of violent and sex offender recidivism. Considerable empirical work has been conducted on the factors related to sexual recidivism (Castellino, Bosco, Marshall, Marshall, & Veglia, 2011; Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2005; Veglia & Castellino, 2013), and risk assessment scales have been developed to combine these risk factors into an overall assessment of recidivism risk (Craig, Browne, & Beech, 2008; Hanson & Morton-Bourgon, 2009). The actuarial approach is a common method of combining items into a structured risk scale, where individual items are combined according to explicit rules, and total scores are linked to empirically derived estimates of recidivism probability. The research evidence shows that no risk factors singularly determine recidivism, and as such, empirically informed risk assessment requires synthesis of multiple factors (Helmus, Babchishin, & Hanson, 2013).

Actuarial Risk Assessment (ARA) is common practice for the definition of the sentence and the possible granting of alternative measures. Formal risk assessment as well as evaluation of treatment areas are required to inform legal services as to the best method of management, as well as treatment options for offenders.

Several studies, reviews of the literature and a series of meta-analyses evidenced a superiority of actuarial data combination for the prediction of recidivism (Doren, 2002; Hanson & Morton-Bourgon, 2004, 2009; Harris & Hanson, 2010; Langton et al., 2007; Looman, 2006; Otto & Douglas, 2010).

There are over a dozen actuarial scales designed for sexual offenders: the most popular are the Rapid Risk Assessment for Sex Offence Recidivism (RRASOR; Hanson, 1997); the Structured anchored clinical judgements (SACJs; Thornton, 1997); the STATIC-99 (Hanson & Thornton, 2000); and the Risk Matrix 2000 (RM-2000; Thornton et al., 2003).

Rapid Risk Assessment for Sex Offence Recidivism: RRASOR

The RRASOR was developed by Hanson in Canada (Hanson, 1997) using data from a meta-analysis of recidivism studies (Hanson & Bussière, 1998) and then replicated on an independent sample of 2592 offenders (Hanson, 1997). In a validation sample the RRASOR correlated .28 (Area Under the Roc Curve AUC = .68) with sexual offense recidivism and .22 (AUC = .64) with any violent recidivism (Hanson & Thornton, 2000). Barbaree, Seto, Langton, and Peacock (2001) reported AUC = .76 (r = .26) for sexual recidivism and AUC = .65 (r = .20) for violent recidivism, while Sjöstedt and Långström (2000) reported correlations of .22 (AUC = .72) with sexual reconvictions. More recently Sjöstedt and Långström (2002) reported AUC of .73 and .62 for sexual and non-sexual violent recidivism.

Structured anchored clinical judgements: SACJ-Min

SACJ, developed by David Thornton (1997), assesses the risk of sexual and violent recidivism. It is designed so that the assessment of risk can change over time as more information about an offender becomes available. It is made up of three stages, with risk reassessed at each step. Stage one details static or historical risk factors, while stage two relates to aggravating factors, the presence of which can increase the risk category. The first two stages are referred to as SACJ-Minimum. The third stage assesses current behaviour and response to treatment programmes. Tested on a cohort of 533 sex offenders (80% of whom offended against children) the SACJ-Min correlated .34 with sexual offense recidivism and .30 with any sexual or violent recidivism (Hanson & Thornton, 2000). In developing the Static-99, Hanson and Thornton (2000) reported SACJ-Min correlations of .23 (AUC = .67) with sexual offense recidivism, and .22 (AUC = .64) with any violent recidivism.

STATIC-99

Static-99 (Hanson & Thornton, 2000) was developed from a combination of SACJ-Min and RRASOR and was based on four diverse data sets, three of which were used to develop RRASOR.

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) (Harris, Phenix, Hanson, & Thornton, 2003). Sjöstedt and Långström (2000) reported AUC of .76 for sexual recidivism and .74 for non-sexual violent recidivism using Static-99. Similarly, Thornton and Beech (2002) reported AUC = .91 for sexual recidivism using Static-99 over a six-year follow-up while Friendship, Mann, and Beech (2003) reported AUC of .70 for sexual reconviction and sexual and/or violent reconviction over a two-year follow-up. These scores are consistent with Barbaree et al. (2001) and Thornton and Beech (2002). Nunes, Firestone, Bradford, Greenberg, and Broom (2002) reported AUC of .70 and .69 for sexual and sexual/violent reconviction, respectively, using Static-99.

Risk Matrix 2000: RM-2000

The RM-2000 is the scale that is used nationally in England, Wales and Scotland by prison, probation and police services. The RM-2000 is an empirical-actuarial risk scale because the items were developed based on empirical research.
 The RM-2000 consists of three scales:
1. RM-2000/S (RMS) is a prediction scale for sexual offending.

2. RM-2000/V (RMV) is a prediction scale for non-sexual violence engaged in by sex offenders.
3. RM-2000/C (RMC) is a combination of the first two scales and predicts sexual or other violence.

The final score is a translation of scales C in risk categories: low risk (score = 0), medium risk (score = 1–2), high risk (score = 3–4) and very high (score = 5–6).

There are two stages to conducting the RM-2000.

In *stage 1*, the following four items:

- age at commencement of risk,
- number of sexual offences,
- number of court appearances and
- total number of criminal court appearances

are used to place the offender into one of four groups: low, medium, high or very high risk.

In *stage 2*, four aggravating factors are considered: if offenders ever had a male sexual offence victim, if they ever had a stranger as a sexual offence victim, the presence of non-contact sexual offences and the lack of a long-term intimate relationship. If two or three of these factors are present, the risk category is raised by one level and if all four are present, the risk category is raised by two levels.

In order to determine non-sexual violence risk, three static variables are used to produce a score ranging from 0 to 8.

Reconviction rates of 60% over a 19-year period are expected for the very high-risk group, around 40% for the high-risk group, 18% for the medium risk group and 8% for the low risk group. Non-sexual violent recidivism rates over a 19 years follow-up period are 63%, 41%, 19% and 5%, respectively (Craissati, 2004). Beech, Fisher, and Thornton (2003) reported that at least two cross-validation studies on UK samples have been conducted where the AUCs varied between the low 0.7 s and the low 0.8 s. In a cross-validation of the RM-2000, Craig, Beech, and Browne (2006) compared this tool with four risk scales (RRASOR, SACJ-Min, SVR-20, Static-99) to support the use of some actuarial sex offender risk measures, in particular the RMS and RMV scales. The RMV consistently obtained moderate accuracy in predicting violent, sexual/violent events, and, in general, any reconviction across the three follow-up periods. Although not significant, the results from this study are broadly consistent with the literature on RRASOR (Hanson & Thornton, 2000). However, in contrast to previous findings, RRASOR obtained a higher AUC index predicting violent reconviction (AUC .66 at two years and .71 at five and 10 years) in the sample of sexual offenders. As regards Static-99, this study reported an AUC of .57 for sexual and violent reconviction at two-year follow-up. Static-99 was better at predicting violent recidivism than sexual recidivism in both sexual and combined sexual/violent samples. These results are broadly consistent with Nunes et al. (2002) who reported slightly lower AUC indices than Barbaree et al. (2001) and Friendship et al. (2003). A similar pattern was found for the SVR-20. The results reported in the present study are consistent with those reported by Sjöstedt and Långström (2002). The differences between the AUC indices reported here and those of other studies may partially be explained by the differences in sample characteristics. The inclusion of four additional risk items had a positive effect on the accuracy of RMS (AUC .71 at two years, .74 at five years and .62 at 10 years), and Static-99 (AUC .62 at two years, .61 at five years, and .57 at 10 years). However, this effect was not significantly correlated with sexual reconviction. The four additional risk items had a negative effect on the accuracy of the RMV in predicting violent reconviction.

A study by Kingston, Yates, Firestone, Babchishin, and Bradford (2008) examined the predictive accuracy of two risk assessment instrument (Static-99 and RM-2000) in a North America sample of sexual offenders. Results provided preliminary support overall for RM-2000. All RM-2000 subscale and the total combined scale significantly predicted all types of recidivism. For sexual recidivism, AUC's were moderate; for violent recidivism and any criminal recidivism, AUCs ranged from medium to large. Helmus et al. (2013) in a meta-analysis identified 16 samples (from 14 studies) from the UK, USA, Canada, Denmark, Scotland and Germany. The three RM-2000 scales significantly predicted all recidivism types (i.e. sexual, non-sexual violent, any violent, non-violent and any recidivism) and the Sex Scale provided the best predictive accuracy for sexual recidivism (d = .74).

A review of literature indicates that, worldwide, the evaluation of ARA was developed in North Europe and in North America, and—generally—in English-speaking countries (Helmus, Hanson, & Morton-Bourgon, 2011). Actually, in Europe we find some difference: whereas in the UK, Scotland and Northern Ireland RM-2000 is commonly used (Grubin, 2008a), in continental Europe, in particular in Germany, Belgium and Austria, Sweden, Switzerland, Denmark and Holland, the most widely used scale is STATIC-99 (Helmus, et al., 2011, 2013; Ireland & Craig, 2011; Rettemberger & Eher, 2006).

In Italy, we often find the phrase "risk of recidivism" in legal documents, but we do not have a validated scale to measure this risk. Our legal system does not contemplate legal norms that define successive moments of contact with the ex-convicted release, and at this moment it is impossible to value the percentage of recidivism in the long run. Nevertheless, the evaluation of ARA provides indicators about the level of dangerousness and some ability to establish alternative measures to detention.

Purpose of current study

The Italian Society of Sexology and Sexual Psychopathology (S.I.S.P.Se.) was founded in 2001 in Turin (Italy) with the aim of studying sexual psychopathology, focusing on sex offenders' treatment and evaluation. Recently, S.I.S.P.Se.'s interest has focused on the evaluation of a tool for actuarial sexual recidivism risk assessment: the RM-2000 (Rosso, Garombo, & Furlan, 2010). S.I.S.P.Se. wants to introduce the use of RM-2000, in Italy.

This instrument was selected because of its following qualities:

- ease of use;
- ease of coding;
- type of information required;
- the clarity of its obtained results and
- predictive validity.

In order to obtain the main objective S.I.S.P.Se. checked the internal validity of RM-2000. RM-2000 Italian validation provides an objective instrument of sexual static recidivism risk for the professional operators who work in this field.

This is the first necessary step to introduce risk assessment at the time of sentence, followed by long-term monitoring of people who give voluntary consent. We hope that all these steps could promote new norms in our legal system.

Italian context

In Italy, before 1996, the Rocco Code (Italian Penal Code, R.D. 19.10.1930) classified the crime of rape and incest, respectively, among crimes against public morality and decency, and among crimes against family morality. In 1996, law n. 66 (Italian Penal Code, Law n. 66, G.U. 20.02.1996 Norme contro la violenza sessuale) "Norms against sexual violence" states the principle that sexual aggression is a crime against the person who is constrained in sexual freedom and not against public morals. This change has allowed Italian institutions to focus more attention on the characteristics and behaviour of the aggressor. Under current law, the penalty for those accused of sex crimes is defined by the Criminal Code (Italian Penal Code, Libro II "Dei delitti in particolare" Ed. 2006). At the time of definition of the sentence, no psychological or risk assessments are required, because no intervention other than detention is culturally recognised. Only since the beginning of 2000 have some Italian prisons developed a different treatment programme inspired by international works (Grubin, 2008b; Marshall, 1989; Rosso, Garombo, Oliva, Furlan, & Picci, 2014). After the detention period, probation services do not provide supervision or psychological and social support. In addition, a certificate of criminal record after the detention period is not available for research or monitoring purposes. This is why today in Italy it is not possible to assess the risk of recidivism longitudinally.

Method

After a sexual offender treatment training provided by National Probation Service Northumbria (New-castle, UK), a group of S.I.S.P.Se. Associates organised a two-day course to form a pool of psychologists for data collection.

RM-2000 was translated from English into Italian and then from Italian into English to ensure the correct meaning of each item. S.I.S.P.Se. requested authorisation from the Ministry of Justice in Rome to collect data in different Italian prisons and the following prisons joined: Biella, Saluzzo, Torino, Verbania, Vercelli in Piedmont Region and others (Bollate, Ferrara, Padova, Pordenone), all in Northern Italy. To fill out the RM-2000, all the information was gathered directly from the pool of psychologists through the reading of the full sentences, by the certificate of criminal record and other information contained in the documents from the area of prison education. Moreover, we also considered the following variables for all subjects: age, education, marital status, drugs and/or alcohol use and presence of psychiatric disorders. The total sample consisted in 308 adult male sex offenders with a definitive sentence, aged 18 and older. All those subjects have been through one or more convictions for rape, sex abuse or child sex abuse.

Confidentiality was ensured by using progressive ID numbers for each prison, and by not including any personal information other than the details above.

Scoring criteria

For the scoring we used the following criteria:

Age at commencement of risk, that is, age at which the subject is next "able to" offend. We considered the age at the moment of release.

Sexual sentencing appearances are the number of occasions on which the subject has been sentenced for a sex offence. It does not refer to the number of convictions but number of sentences. Sex convictions include offences in which there was a clear sexual element.

Criminal appearances are the number of occasions on which the subject has been sentenced for any offence (including sex offences, which are therefore double counted). As for sexual sentencing appearances, criminal appearances are concerned with sentencing occasions, and not with the number of offences.

Any conviction for a sex offence against a male does not include offences that involved consenting sexual activity between adult men.

Any conviction for a sex offence against a stranger means a victim who did not know the offender 24 hours prior to the offence.

Any conviction for a no contact sex offence includes Internet offences and stalking: it is not scored if the non-contact offence occurred as part of a contact sex offence.

Single means never having lived with an adult lover for more than a two-year period. Irrespective of marital status or gender. No allowances are made for age.

The final risk category means that the subject belongs to a group in which the reconviction rate is approximately as follows:

Low Risk = 10%, Medium Risk = 20%, High Risk = 40%, Very High Risk = 60%.

Results

Statistical analysis

The results are expressed as the mean ± standard deviation or median and percentages, as appropriate. For categorical variables univariate analysis was performed by the Fisher exact test or χ2 test as appropriate. For continuous variables, differences in means were tested by parametric one way analysis of variance, and post-hoc *t*-tests were performed with Bonferroni correction of type I error.

Table I. Flush of offender's socio-demographic characteristics, type of crime and victims

	n	%
Education level		
Unlettered	4	1.3
Primary school	93	30.2
Lower secondary school	168	54.5
Upper secondary school	34	11.4
University degree	8	2.6
Marital status		
Single	94	30.8
Married/cohabiting	130	42.9
Separated/divorced	72	23.7
Widower	8	2.6
Offenses		
Sex offence	274	89
Private violence	9	2.9
Domestic abuse	11	3.6
Group sex abuse	15	4.9
Sexual indecent exposure	12	3.9
Pornographic detention	9	2.9
Prostitutution conviction	4	1.3
Victims		
Underage victim within the family	77	25
Underage victim outside the family	92	29.9
Adult victim within the family	44	14.3
Adult victim outside the family	76	24.7

Note: Multi percentages.

Principal component analysis (PCA) with Promax rotation was performed and latent factors with eigenvalue greater than 1 were considered. Within each factor, items with values greater than .4, were retained. The Statistical Package for the Social Sciences version 17 was used for statistical analysis.

Data were obtained from 308 male offenders. The mean age at administration of the instrument was 49.3 ± 7.3 years, with a range from 19 to 85 years, and half of the offenders were more than 48 years old.

Within the sample, 14% of the offenders had a high school level of education and almost 43% has a stable relationship. The 89% of the offenders were sentenced for rape and the victims in 25% of the cases were underage family members, about 30% were underage non-family members, and about 25% were adults and not family members (Table I). Data indicated that 24% of offenders had a psychiatric disorder, and 37% had drug or alcohol problems, in their life history.

The distribution of the offenders across the four risk categories show that 47.1% have a low risk of recidivism and about 14% have a high or very high risk of recidivism (Table II). There are no differences with respect to educational background, while the differences in marital status are statistically significant $p < .05$. Almost half of the high/very high-risk offenders are single, and only 23.4% of singles have a low risk of recidivism while in the other categories the low risk population ranges between 50% and 68%. We also found statistically significant differences $p < .05$ in age at administration with a decreasing gradient of mean age that is correlated with increasing the risk category.

Table II. Flush of the offenders risk categories

Risk category	S scale		V scale		C scale	
	N	%	n	%	n	%
Low	187	60.7	205	66.6	145	47.1
Medium	95	30.8	62	20.1	122	39.6
High	24	7.8	28	9.1	35	11.4
Very high	2	0.7	13	4.2	6	1.9
Total	308	100	308	100	308	100

Table III. Eigenvalues, explained variance and factor loadings for explanatory factor analysis with varimax rotation of RM-2000 for Italian sample

	Factor 1	Factor 2	Factor 3
Eigenvalues	2.41	1.58	1.39
Explained variance (%)	24.11	15.82	13.90
Factor loadings			
Age of onset S scale	−.02	**.89**	−.02
Previous sex offence sentencing occasions	**.42**	−.19	.25
Previous sentencing occasions for all criminal offences	**.86**	−.14	−.02
Any male victim ever	−.14	−.20	**.46**
Any stranger victim ever	.06	.15	**.66**
Any non-contact sex offence ever	.07	−.14	**.63**
Single	−.05	.26	**.56**
Age of onset V scale	.01	**.89**	.03
Previous non-sexual violence offence sentencing occasions	**.78**	.11	−.10
Any convictions for burglary	**.75**	.14	.01

Note: Factor loading >.40 are in boldface.

Low risk offenders have a mean age of 53 years, medium risk a mean age of 48.3 years and high/very high risk a mean age of 39.1 years old.

In the Italian sample a three-factor structure emerges, as is the case with other studies (Pham & Ducro, 2008; Roberts, Doren, & Thornton, 2002). In particular, the PCA of RM-2000 identifies a structure with three factors that explain 53.8% of the total variability:

- Factor one concerns items referred to the criminal career of the offender;
- Factor two concerns the age of onset in committing crimes and
- Factor three is more strictly related to the offender attitudes towards sex crimes and completely reflects the aggravating items of the S scale (Table III).

Discussion

The purpose of this study was to check the internal validity of RM-2000 in an Italian sample of sex offenders. In addition, a factor analysis for each internal scale was carried out and, after that, the predictive quality of their main factors was analysed.

Statistical analysis shows that factor I is linked with an offender's criminal career. The number of definitive sex sentences (RMS) has a weight in the definition of the level of recidivism risk, but the risk increases further if the person has been convicted for other non-sexual crimes (RMV), in that they identify a person as one with a criminal lifestyle.

The second factor concerns the age at the end of sentence. Hanson (2002) found that "the recidivism rates decline steadily with age" and that "the association was linear", but Fazel, Sjöstedt, Långström, and Grann (2006), in a follow-up study of adult male sexual offenders released from prison in Sweden during a period of 4 years, showed that recidivism rates decreased significantly in older age bands; in the case of sexual offence against a stranger, criminal history, sexual deviance such as exhibitionism may be strong risk factors for sexual recidivism in older sexual offenders. Moreover, Prentky and Lee (2007), in a study on the effect of age at release on long-term sexual reoffense examined recidivism in two groups: 136 rapists and 115 child molesters. The data supported the conclusion that risk of sexual recidivism diminishes as a function of increasing age at the time of release for rapists, while the equivalent pattern among the child molesters begins with low risk, increases sharply, remains on a plateau for several decades, and declines at the age of 60. This difference could be explained by the fact that rape is a fundamentally predatory antisocial behaviour, while child molestation is characterised by anomalous sexual preference with persistent patterns that reflect greater longevity. Our data support the idea that age is identified as a factor.

The third factor is related specifically to sexual crimes, and in particular with four S scale aggravating factors. Any conviction for a sex offence against a male, for a sex offence against a stranger, or for

a non-contact sex offence, and never having lived with an adult lover for more than a two-year period are all factors that increased the level of risk and are connected to dynamic risk factors like critical relationships or a deficit in recognition and management of emotional states extensively underlined by research in this field (Bumby, 2000; Burk & Burkhart, 2003; Marshall, 1989; Marshall, Hamilton, & Fernandez, 2001). The fact that even in the Italian sample these factors are identified gives these items a weight in the definition of risk and can be regarded as overall evidence in agreement with what is proposed by the British studies.

Comparison with the English sample

The comparison with the frequency distributions of the English sample (Grubin, 2008a) highlights significant differences in the distribution of risk levels in both the RMS and RMV. In both scales the following are detected: in the Italian sample, a higher proportion of people classified as low risk (60.7% of the Italian sample against 36.2% of the English sample for the RMS, and 66.6% of the Italian sample against 40.0% of the English sample for the RMV) and a corresponding lower percentage of people classified as high risk or very high (respectively, 8.4% of the Italian sample against 23.4% of the English sample for the RMS and 13.3% of the Italian sample against 26.7% of the English sample for the RMV).

It is assumed that the differences could be due to a multiplicity of factors. The sample size may be one of these factors, even if—as regards the Italian context—308 sex offenders still represent a significant proportion of offenders. More important seems to be the age difference of the two compared samples: the English sample in fact has an average age that is significantly lower than the Italian sample (mean age of 41.7 years in the English sample against 49.3 years average age of the Italian). Given the documented effect of age on risk level, it seems reasonable to move towards lower levels of risk. The differences between the Italian and English sample may also be linked to a different judicial system and to the criteria used to determine the detention period. The presence of a network from which to draw data such as court appearances or different sentences allows more reliable data about recidivism. This would explain the high percentage of high-risk individuals, a category that includes those who have committed more crimes, not just sexual.

Conclusion and future prospect

The internal validation of the RM-2000 has represented a crucial achievement for us. In fact, the RM-2000 is the first scale for the assessment of risk of recidivism used in Italy, but the current legal system does not allow us to carry out an external validation of this instrument. While in many countries it is possible to find data, over time, to evaluate possible recidivism through the Offender Index or archives of the Police Force, in Italy all this is not possible for two principal reasons:

- our legal system does not provide a national database from where to obtain information about demographic and psychological characteristics of offenders and
- our legal system does not provide a monitoring phase after a period of detention.

An additional reason is that public opinion in this period is badly shaken by the high number of violent acts against women and the institutions are wondering how to stem the phenomenon. It might be useful to create a database that collects information referring prisoners for sex offenders currently held in Italian prisons in order to assess the actual percentage of criminal recidivism, and on the basis of new knowledge (level of and risk characteristics of the aggressor) to study or propose the necessary measures to be taken.

Limits of this paper

The principle limitation of our validation is the impossibility of having recidivism data, but we were aware of this. So, in this context we had three possibilities: to do nothing, to build a new tool, or to do

an internal validation of RM-2000 to address the needs of the area of prison education and of the courts that require tools providing objective data, and to have, in the future, the possibility to compare those with the ones from international research. Finally, current treatment programmes in our country represent a promising step towards the creation of samples that would allow us to assess recidivism risk more consistently over time.

Acknowledgements

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