Validation of Two Standard Risk Assessments (RRASOR, 1997; STATIC-99, 1999) on a Sample of Adult Males who are Developmentally Disabled with Significant Cognitive Deficits

by

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A thesis submitted in conformity with the requirements
for the degree of Masters of Arts
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Abstract

Problematic sexual behaviours in men with developmental disabilities often severely stigmatize, restrict, and limit the success of these individuals in our communities. Two actuarial risk assessments, the Rapid Risk Assessment of Sex Offender Recidivism (RRASOR) and the STATIC-99, developed for men with average intelligence, were applied to a population of men with significant cognitive deficits ($\underline{N} = 76$). Analyses revealed that many factors that predict sexual reoffence in normative samples also predict reoffence in this sample. The 4 item RRASOR, outpredicted the 11 item STATIC-99. This may indicate a wider latitude of application to more diverse populations for the more generalizable RRASOR. Actuarial risk assessment can be used to better rationalize treatment and supervision resources thereby improving quality of treatment, community access and community safety. Future research should increase sample size and focus on the prospective investigation of dynamic predictors in samples of individuals with developmental disabilities.

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The recent closure of provincial institutions for individuals with developmental disabilities presents a major health care challenge, especially for clients who also have a history of sexual behavioural problems. Conservative estimates of the prevalence of sexual offenders in the developmentally disabled population range between 10 and 15% (Murphy, Coleman & Haynes, 1983). Such discharge from secure settings places sexual offenders with developmental disabilities at an increased risk to reoffend. As a result, mental health workers in the community are more frequently called upon to identify individuals who are at risk for reoffence and to help manage risk.

The assessment of risk in sexual offenders has a time-honored history as noted by Bonta (1996). He has described a generational approach to risk assessment. These generations include: 1) Clinical judgment based on an informal approach, in the absence of agreed upon rules 2) Actuarial assessment that uses static factors to predict risk, 3) Dynamic assessment that monitors changes in individuals over time as a way of predicting risk. A brief consideration of each of these risk assessment approaches provides a framework for understanding the goals of the present study.

Clinical Judgment of Risk Assessment.

The first-generation of risk assessment was comprised of decisions that were based on subjective judgments or what might be described as professional opinion driven by intuition. Assessments completed with this approach involved decision rules that were not articulated nor replicated and were, therefore, questionable in their reliability. Menzies, Webster, McMain, Staley, and Scaglione (1994) empirically tested the reliability of clinical judgment by rating the dangerousness of offenders who were receiving mental health status examinations. A variety of professionals, including nurses, psychologists, psychiatrists, social workers, and correctional officers were asked to rate the probability of violent re-offence over a six-year period in a population of offenders who had been referred for mental health status examinations. These

professionals were unable to make consistent or accurate predictions, demonstrating the lack of predictive validity of clinical judgment. The failure of expert evaluators who employ clinical judgment to distinguish between low-risk and high-risk offenders has been repeatedly demonstrated by numerous other investigators (e.g. Dix, 1976; Quinsey & Ambtman, 1979; Rice, Harris & Quinsey, 1996; Sturgeon & Taylor, 1980). Hanson and Bussière (1998) found that the predictive accuracy of most clinical judgments was just above chance level (r =.10). Reliance on such clinical judgment alone was the exclusive nature of risk assessment until the 1930's (Burgess, 1928) and, despite the lack of empirical support, some practitioners continue to rely on clinical judgment even today.

Actuarial Assessment Using Static Factors.

An improvement over the first-generation of risk assessment came with the identification of factors that were believed to contribute to the assessment of risk of reoffence. This second-generation risk assessment approach was spearheaded by the work of two research teams. The first was Burgess (1928) who, in his study of over 2000 parolees, identified 21 factors designed to differentiate between people who were successful in their return to society and those who reoffended. Glueck and Glueck (1950) studied delinquents and created prediction tables, which assigned weights, 0 or 1, to different variables indicating which factors they felt were of greater importance in determining risk to reoffend.

Beginning in the 1970's, the actuarial approach to risk assessment began with the creation of the Statistical Index on Recidivism scale (SIR; Nuffield, 1982) in Canada and the Salient Factor Score scale (SFS; Hoffman, 1983) in the United States. Both actuarial scales are based on empirically based indicators that were found to reliably differentiate low-risk from high-risk offenders. These included the two basic types of risk prediction variables: static and dynamic. Static variables are historical, unchangeable factors within the offenders' life that indicate an increased risk for recidivism. For sexual offenders, these would include a history of

sexual convictions, being younger, having male victims, and having stranger victims (Hanson & Bussière, 1998). While these actuarial assessments that use "static" variables were a significant improvement over clinical judgment, a major drawback of these scales was that the assessments provided minimal direction for formulating treatment decisions as they were made up of largely static historical items or fixed items that are not amenable to change. This is evident as 13 of the 15 SIR items and 6 of the 7 SFS items are comprised of historical items that cannot be altered, such as criminal history.

Dynamic Assessment Approaches.

Whereas the second-generation of risk-prediction tools focussed on static or fixed historical factors, the third-generation of actuarial assessment went beyond simple statistical risk prediction and included variables designed to measure behavioural change. These variables are called "dynamic" variables. Quinsey, Rice and Harris (1995) called for the identification and evaluation of dynamic predicators as one of the most important needs in sexual offender assessment. An example of such an assessment relating to sexual offenders was offered by Hanson and Harris (2000). The Sexual Offender Need Assessment Rating (SONAR) measure was designed to assess changes in risk levels relative to changes in offender functioning. This instrument contains dynamic or changeable risk predictors that are divided into two sub categories; five stable dynamic predictors and four acute dynamic predictors. These factors can measure change in individuals who have the opportunity to reoffend.

Hanson and Harris (2000) note that there are two types of dynamic variables: stable and acute. Stable predictors are personal factors that are directly related to reoffending and can be changed slowly by intervention. These stable factors include general patterns of self-regulation, attitudes and values surrounding criminal thinking and sexual deviance, and the offenders' pro-criminal/anti-criminal social influences. Acute risk factors are transitory and rapidly moving

changes in behaviour, feelings, and cognitions that can trigger a reoffence. These include substance abuse, negative mood states, anger and hostility, and access to victims.

Risk Assessment of People with Development Disabilities

In assessing risk for people with developmental disabilities, we are not ready to step to third-generation assessment. This is because we have not yet validated the basic static building blocks of overall risk prediction with this population. The present research project is important in that it is the first attempt to validate previously established risk assessment indicators with a developmentally disabled population of sexual offenders. Once we have ascertained the basic statistical static building blocks of risk prediction through validation of second generation risk assessments, we will then be able to expand our knowledge and ability by adding dynamic variables to an established and valid static base.

Application of Static Risk Assessment Approaches

One of the useful outcomes of second-generation actuarial assessment of risk is our markedly increased ability to tailor service delivery to actual risk as recommended by Andrews and Bonta (1994, 1998). Andrews and Bonta have shown that providing intensive services to low-risk offenders is rarely, if ever, associated with a reduction in recidivism. Out of this observation, they have developed the *risk principle*, which states that services should be provided to an offender in direct relation to the risk they pose for reoffence. Andrews et al. (1990) have shown that providing intensive services to low-risk offenders can actually increase the possibility of recidivism. Low-risk offenders should receive a low intensity of services and high-risk offenders should receive a high intensity of services with a natural gradient formed between these two poles for moderate risk offenders. The use of second-generation assessment measures of risk enhances our ability to tailor service delivery appropriately to the level of assessed risk.

Hanson and Bussière (1998), started this process of developing a list of factors relevant to sexual recidivism. Hanson and Bussière (1998), completed a meta-analysis of recidivism risk factors based on 61 different data sets. In total, their meta-analysis examined data from 28,972 primarily adult male sexual offenders. With an average 4 to 5 year follow-up period, the overall recidivism rate was 13.4% for sexual offence (n = 23,393), 12.2% for nonsexual violent offences (n = 7, 155), and 36.3 % for any recidivism (n = 19,374). The strongest predictors of sexual recidivism were characteristics that were directly related to the construct of sexual deviance. These predictive factors included phallometric assessments of sexual preference for children (r = .32), prior sexual offences (r = .19), age (r = -.13), early onset of sexual offending (r = .12), any prior criminal offences (r = .13) and never having been married (r = .11). The risk of recidivism was lower for offenders who knew their victims or were related to them. Those offenders who failed to attend treatment or who dropped out of treatment were at higher risk to reoffend than those who successfully completed treatment. Although Hanson and Bussière found many individual factors that were related to sexual recidivism, these relationships tended to be modest (.10 to .20 range). Even the strongest of these predictors is not sufficiently reliable to justify its use alone. Therefore, the next logical step was to attempt to combine the strongest and most easily scored of these factors into a useful actuarial risk assessment.

The Rapid Risk Assessment of Sexual Offender Recidivism (RRASOR, 1997)

The Rapid Risk Assessment of Sexual Offender Recidivism (RRASOR; Hanson, 1997) is an example of a second-generation risk assessment that relies upon actuarial data for sexual offender recidivism risk assessment. This scale consists of four static historical variables including history of sexual conviction, age at assessment, victim gender, and the offenders' relationship to the victim. Scoring of the RRASOR produces a risk score ranging from 0 through 6 which relates to a specific risk of recidivism over five and ten year periods. Risk of recidivism increases directly with the RRASOR score. This measure was validated on seven different

mixed group sexual offender samples, representing a range of settings in which risk assessments are frequently conducted (i.e., correctional institutions, specialized treatment programs, secure mental health facilities), with a total sample size of 2,592. Scores on the RRASOR correlate .27 with sexual offender recidivism and produce a Receiver Operating Characteristic (ROC) curve of .71, considered to be a moderate level of prediction.

The STATIC-99 (1999)

The STATIC-99 (Hanson & Thornton, 1999) is an actuarial tool that was created as a combination of two existing assessments, the RRASOR, and Thornton's Structured Anchored Clinical Judgment scale (SAC-J; Grubin, 1998). The resultant assessment consists of ten static items that cover such concepts as sexual deviance, range of potential victims, persistence in sexual offending, anti-sociality, and age. Scoring of the STATIC-99 produces a risk score ranging from 0 through 12 that relates to four specific risk categories: low, medium-low, medium-high, and high that can be used to predict recidivism up to fifteen years. The STATIC-99 was validated on four diverse data sets with a total sample size of 1,301 sexual offenders. Scores on the STATIC-99 correlate .33 with sexual recidivism and produce a ROC curve of .71, considered a moderate level of prediction.

Application to Individuals with Developmental Disabilities who have Histories of Sexual Offending

Sex offending is a serious and pervasive problem in the developmentally disabled population and this is reflected in the literature. The prevalence of sexual offences in people with developmental disabilities has been consistently reported as over-represented (Day, 1993, 1994). Walker and McCabe (1973) report sex offences in a population of 331 mentally handicapped males. In this report, mentally handicapped males reoffended at a rate six times higher than the general population and 2 to 3 times higher than other people in the study who were mentally disordered offenders. These remarkably high statistics are echoed in the

recidivism rates of offenders with developmental disabilities. Klimecki, Jenkinson, and Wilson (1994), with a sample of 75 male offenders who were intellectually disabled, reported a recidivism rate of 41.3% over a 42 month follow-up period when recidivism was defined as re-incarceration in prison for any offence. They further reported that of those who reoffended, 84% recidivated within 6 to 12 months following release. The most commonly committed crimes were theft/robbery, assault, sex-related offences, and property damage. A critical understated factor common to all these studies is the absence of any supports or treatment being offered to the offenders during incarceration, at release, or in the community. Klimecki et al. (1994) describe one of the aims of their study being "to provide data which could be used to justify the implementation of rehabilitation programs available to mainstream prisoners for offenders with an intellectual disability" (p. 221).

Although reflective of the impact that incarceration alone has on recidivism with the developmentally disabled population, these skewed reports are chilling in their potential for misinterpretation, misunderstanding, and misuse. Recidivism statistics are often quoted with no reference to the context in which they were collected, such as the lack of treatment or social and employment supports offered to the participants. Further, these statistics play into the stereotype that people with developmental disabilities are sexually dangerous. Few of these authors do any kind of analysis of the historical and systemic issues that might explain some of the sexually assaultive behaviour. These statistics can readily be misinterpreted as meaning that sexual offending behaviour is a characteristic of the disability rather than as a possible result of inappropriate environments, insufficient teaching, and inadequate support (Hingsburger & Tough, 1998).

There needs to be recognition of vulnerability factors for people with developmental disabilities including combinations of cognitive, psychiatric, economic, communication, and personal-social characteristics. Individuals who are developmentally disabled also often have

historical factors such as institutional histories, greater likelihood of having experienced physical, emotional, and sexual abuse, having less education in social-sexual areas and a tendency to seek social approval from others. Individuals with developmental disability also experience ongoing exposure to stigma and rejection. These factors have all been cited as increasing the susceptibility to criminal behaviour (Gardner, Graeber & Machkovitz, 1998; Nezu, Nezu & Dudek, 1998). Some of these factors are now being recognized as potential setting and antecedent variables to sexual offender management. These risk assessment factors need to be addressed in any risk management effort. At this time there are only two citations introducing the conceptual framework of risk assessment with the developmentally disabled population, as presented in Nezu, Nezu and Dudek (1998) and Heilbrun, Nezu, Keeney, Chung and Wasserman (1998). Researchers in the area of developmental disabilities are just beginning to discuss the application of dynamic factors in risk assessment and management. Yet the application of static factors, or the relevance of actuarial risk assessments for this population cannot be found in the current literature.

There are some authors who review both the past and current approaches to the treatment of individuals with developmental disabilities who have criminally offended (Conley, Luckasson & Bouthilet, 1992; Tudiver, Broekstra, Josselyn & Barbaree, 1997). Program models are also being developed to address service deficiencies (Coleman & Haaven, 1998; Denkowski & Denkowski, 1986). However, effective treatment protocols to support program alternatives for developmentally disabled offenders, based on empirical data, are very few (Abel, Osborn, Anthony & Gardos, 1992; Lund, 1992; Nezu, Nezu & Spangler, 1995). Gardner et al. (1998) have taken some steps to review effective program models. The dearth of application of empirically sound risk assessment tools in program design and community access decisions is remarkable by its absence. Thus the goal of this study is to determine whether two actuarial risk assessments, the RRASOR and the STATIC-99, developed and used with offenders with average

intelligence quotients (IQ's) can be validated on a sample of males with developmental disabilities who reside in the community.

Hypotheses

1. Actuarial risk assessments developed with offenders with average IQ's can be used to assess the level of risk within the sub-population of people with developmental disabilities who exhibit sexually inappropriate behaviours. The variables related to risk for men of average IQ (e.g. sexual arousal to children, stranger victims, criminal charges, previous offences) will also apply as risk predictors for men with developmental disabilities.
2. For those individuals who received services, the level of supervision received will be commensurate with the assessed risk level of the individual (e.g. individuals who are assessed as being low risk of reoffence will have little or no supervision while those assessed to be at greatest risk will have more intense levels of supervision).
3. The STATIC-99 will perform better than the RRASOR as an actuarial assessment instrument with this population as it takes into consideration a greater number of potential risk variables.

Method

The present study involved retrospective file coding of existing archival clinical data and file review of existing clinical files of people currently receiving services from York Central Hospital, Mental Health Program, Behaviour Management Services. The mandate of Behaviour Management Services is to provide services for people with developmental disabilities who have significant cognitive deficits (mental retardation) and have severe behavioural problems.

Participants

Participants were 76 males, 18 years of age and older who have a developmental disability with significant cognitive deficit (have been diagnosed with mental retardation). All individuals had been referred for assessment and treatment at a community behaviour management service due to sexual offending behaviours. The sexual behaviours included non-

contact behaviours, (e.g. exhibitionism, public masturbation) and/or physical contact with a victim. Victims include both children (n = 38, 50%) and adults (n = 24, 31.6%) and were familial (n = 10, 13.2%) and extrafamilial (n = 66, 86.8%). The sample represents consecutive referrals to the community based behavioural program since its inception in 1980. This is a mixed sample of recidivists and non-recidivists in that twelve of the 76 individuals have sexually recidivated while living in the community. Recidivism was defined as any sexual or nonsexual charge or conviction, sexual misbehaviour reported by other 'official' sources such as agency staff and other professionals, or complaints of serious sexual misbehaviours verifiable by neighbours or other community members.

Informed Consent

All participants are adults and are their own consent source. Two consent forms were completed. The first form was completed on intake to York Central Hospital, Behaviour Management Services prior to any assessment or treatment services being delivered (see Appendix A). This consent form, appropriately reviewed and endorsed, is in the file of each participant, including both past clients and those individuals presently receiving services.

Second, a written consent form for participation in this study was reviewed with people currently in service. There were 22 people receiving services who consented. The student researcher or a member of the clinical team at the hospital met with each individual and reviewed the consent form. The individual was offered the option of having an advocate or external person present during the review of the consent form. The individuals were informed that they could choose not to consent to be included in the research project. They were reassured that, regardless of their decision, complete access to all services offered by the hospital was available (see Appendix B). Approval to participate in this study and approval of the consent form was sought and obtained from York Central Hospital's, Institutional Review Board (see Appendix C).

Instruments

Objective risk scales.

The Rapid Risk Assessment for Sexual Offence Recidivism (RRASOR; Hanson, 1997) is a brief actuarial assessment designed to predict sexual offence recidivism in the average IQ adult male population. The RRASOR consists of four variables drawn from the Hanson and Bussière (1998) meta-analysis. These variables are a) prior sex offences, b) age at release, c) victim gender, and d) relationship to victim. The validity of the RRASOR was assessed by testing these variables on seven different samples of sexual offenders with a total sample size of 2,592. See Appendix D for test and scoring.

The STATIC-99 (Hanson & Thornton, 1999) consists of ten variables: a) prior sex offences, b) number of prior sentencing dates, c) any convictions for non-contact sex offences, d) index non-sexual violence, e) prior non-sexual violence, f) any unrelated victims, g) any stranger victims, h) any male victims, i) age, and j) marital status. The validity of the STATIC-99 was assessed by testing these variables on four different samples of sexual offenders with a total sample size of 1,301. See Appendix E for test and scoring.

Scoring the instruments.

Both the RRASOR and STATIC-99 were scored twice, first using the standard coding rules that accompany the scale and second using a modified scoring system. The modified scoring system was created because, in several instances, neither the victim nor the staff from the supporting agency reported the alleged sexual offence to police. Also, in some situations when reports were made, the police opted to give the person a warning or recommended diversion programs. Because this sample was being handled in a different manner than average IQ offenders, recidivism information was being lost. The trend of minimization of criminal sanction or consequences for the alleged sexual offence was evident at both the index and subsequent offences.

In the modified scoring system, item number 1 on each scale, number of prior sexual offences, was re-scored reflecting the behavioural history of the individual. A score of one charge was given for sexual offence behaviours observed or reported by professionals within the service system, which in all likelihood, if reported to the police in the normal population, would have resulted in a charge. For example, a neighbour making a complaint to a group home staff that an individual had exposed himself, and the individual had had the opportunity to be in the vicinity of the neighbour, would be counted as one charge. Other examples of behaviours that were coded as one charge include repeated complaints from community members of an individual engaging in sexually offending behaviours (e.g. offering money for sexual favours), staff reporting to the support agency that they had been grabbed in a sexual manner, or a complaint from a peer that they had been touched in a sexually assaultive manner. In all instances, it was established that evidence existed for the behaviour, that the opportunity existed for the behaviour to occur, and that there was physical evidence such as appropriately dishevelled clothing.

Excluded from the scoring were inappropriate sexual behaviours such as the brief touching of another over clothing and allegations where the individual could not be placed in the location at the time of the alleged occurrence. Also excluded from scoring were allegations where an interaction appeared to have been consensual, even if the location was public, collections of pictures of children, and staring at or following children. See Appendix F for details of coding.

File Coding

A standardized coding manual was used. The student, who is also the Director of Behaviour Management Services, coded all data from hospital files. These hospital clinical files are kept as required by hospital policy on hospital property inaccessible to the public. The raw electronic data file is secured in a locked filing cabinet as are all coding manuals. This is

required by hospital regulations. Coding of the clinical file took place in a private office inaccessible to the public on the grounds of the hospital. Only the student researcher had access to the individual risk scores; the primary therapists at York Central Hospital are blind to the actuarial risk scores created by this research. No individual identifying information is kept in the research data file. When a participant's file was coded, a unique identifying number was assigned by the student researcher for individual participant identification. There was no need to ascribe individual names, places, or other identifying information in the database.

Over sixty variables were collected, fitting into the following general categories: basic demographics, reason for referral to program, details on behavioural history including criminal charges and convictions, length of involvement with service, institutional history, reason for developmental disability, diagnosis, whether medications were prescribed at the time of coding, general abuse history, and treatment goals.

Results

Demographic Information

The sample of participants included 76 men. Sixty-four of the participants, 84.2% of the sample, have not returned to sexual misbehaviour while in the community, twelve or 15.8% have recidivated in a sexual manner.

The mean age of the sample at the time of coding was 43.8 years, ranging from 18.6 years to 78.2 years (SD = 14.8). The recidivists had a mean age of 37.6 years as compared to the non-recidivists with a mean age of 45.0 years. There was not a significant age difference between the non-recidivists and the recidivists. The recidivists were significantly younger at the start of community treatment with a mean age of 29.0 years as compared to 39.5 years for the non-recidivists ($t = 2.391$, $p = .019$). Also, length of time at risk, as measured from the time they were identified for assessment/treatment to August 15th, 2000 was significantly longer for the

recidivists at a mean of 8.58 years versus 5.52 for the non-recidivists ($t = 2.089$, $p = .04$). The range of time at risk was from 0.2 years to 19.2 years for the total sample ($SD = 4.8$).

The average age of the recidivists was 34.0 years, with a range of 19.2 to 73.6 years ($SD = 15.0$). As seen under Age at Recidivism in Table 1, a single individual recidivated at 73.6 years of age. This positively skewed the age at recidivism distribution; without this individual, the mean age at recidivism is 30.3 years with a range of 19.2 years to 49.4 years ($SD = 8.8$).

Of the numbers of non-recidivists (27; 42.2%) and recidivists (4; 33.3%) reported being separated from their parents before age 16 years (see Table 2), chi-square analysis indicates there was no significant difference between the groups, $\chi^2(1, N = 73) = .49$, $p = .48$.

Historical Living Situation

As further presented in Table 2, a majority of the sample, 45 or 59.3%, experienced institutional living during childhood and/or adulthood however there was no significant difference between the non-recidivists (40; 62.5%) and the recidivists (5; 41.7%) in recorded histories of institutional living, $\chi^2(1, N = 73) = 2.42$, $p = .12$.

Thirty-four percent of the sample reported physical or emotional abuse during their lives. The total number of men reporting physical or emotional abuse during their lives is consistently high for both groups with 21 or 32.8% of non-recidivists and 5 or 41.7% of recidivists reporting physical or emotional abuse during their lives. On the variable of reported physical and emotional abuse as an adult, there was no significant difference between the non-recidivists (2; 3.1%) and the recidivists (3; 25%) noted on file, $\chi^2(1, N = 34) = .13$, $p = .72$.

Twenty-two percent of the sample reported sexual abuse during their lives. Self-report of sexual abuse occurred with 23.5% of the non-recidivists and 16.6% of the recidivists. On the variable of reports of sexual abuse as a child, chi-square analysis indicates that the non-recidivists (10; 15.7%) and the recidivists (1; 8.3%) did not differ significantly, $\chi^2(1, N = 25) = 2.56$, $p = .11$.

Current Living Situation

The majority of both groups were, at the time of coding, living in group-homes (non-recidivists 59.4% and recidivists 58.3%). The next most common living situation was in their own home (15.6% for the non-recidivists vs. 16.7% for the recidivists). Similar percentages of both non-recidivists and recidivists lived in their family home (10.9% and 8.3% respectively) and supported apartments (6.3% and 8.3%). The remainder of the sample lived in homes for special care, with non-related families, or in nursing homes. One individual was temporarily residing in a provincial psychiatric hospital.

The majority of the sample (56.6%) were receiving 24-hour supervision at time of coding. Chi-square analysis revealed that while there was not a significant difference between the proportions of non-recidivists (39; 60.9%) and recidivists (3; 33.3%) who received 24-hour supervision, $\chi^2(1, N = 76) = 3.13, p = .08$, there was a significant difference between the non-recidivists (10; 15.6%) and the recidivists (5, 41.7%) that were not receiving any supervision. Significantly more recidivists were receiving no supervision, $\chi^2(1, N = 76) = 4.33, p = .04$). See Table 3.

Clinical Assessment

The recorded psychiatric diagnosis of the participants indicates a complex clinical picture. Approximately one-third of the non-recidivist and recidivists had a diagnosis on file that included developmental disability plus reference to two or more other axis 1 or 2 diagnoses from the DSM–IV, see Table 4. Forty-two percent of the recidivists were singularly diagnosed with a developmental disability as opposed to the non-recidivists who were singularly diagnosed in 25% of cases. In this sample a diagnosis of developmental disability indicated mental retardation.

Reports on file reveal that the men are mostly Borderline to mild in their intellectual impairment representing 67.1% of the total sample, (65.7% of the non-recidivists and 75% of the

recidivists). Fifteen or twenty-three percent of the non-recidivists and 3 or 25% of the recidivists are moderate in their level of disability. Chi-square analysis reveals non-significant differences between the non-recidivists and recidivists for level of intellectual functioning, $\chi^2(1, \underline{N} = 69) = .01, \underline{p} = .93$.

As shown in Table 5, forty-three percent of the participants were medicated with antipsychotics and/or antiandrogens. Twelve percent took medication to manage and treat medical conditions such as epilepsy, thyroid conditions, and diabetes. None of the recidivists took medications solely for medical conditions. There are no significant differences in the proportion of non-recidivists and recidivists on medication, $\chi^2(1, \underline{N} = 76) = 1.07, \underline{p} = .30$.

Seventeen percent of the non-recidivists and twenty-five percent of the recidivists were taking psychotropic medications alone. At the time of coding, only one recidivist (8.3%) was receiving anti-androgen medication whereas five non-recidivists (7.8%) were receiving anti-androgen medication.

Further complexity of the clinical picture is indicated by the phallometric testing data seen in Table 6. Phallometric testing was completed on 55.3% of the total sample. Deviant phallometric results were noted in 46.1% of the total sample, 39.1% of the non-recidivists and 83.3% of the recidivists. Twenty-eight point one percent of the non-recidivists and 58.3% of the recidivists tested deviant for age preferences yielding a non-significant difference between the groups, $\chi^2(1, \underline{N} = 40) = .64, \underline{p} = .43$. Four point seven percent of non-recidivists and 16.7% of recidivists tested deviant for activity preferences, a non-significant difference between the groups, $\chi^2(1, \underline{N} = 40) = .83, \underline{p} = .36$.

Behavioural History

The entire group had extensive histories of significant sexual and non-sexual behavioural incidents, see Table 7. Examples included repeated incidents of physical aggression, significant destruction to the environment and repeated sexual offences. There was no

significant difference between the non-recidivists (5; 7.8%) and the recidivists (2; 16.7%) on the number of prior behavioural incidents when the variable examined was 20 or more behavioural incidents noted on file, $\chi^2(1, \underline{N} = 76) = .95, \underline{p} = .33$.

With respect to non-sexual violence, there was no significant difference between the non-recidivists (30; 46.9%) and the recidivists (9; 75%) when the variable examined was the absence of a history of non-sexual violence, $\chi^2(1, \underline{N} = 76) = 3.20, \underline{p} = .07$.

Sexual Offence Histories

Gender/age of victims.

Across the total sample, the victim choice reflects a preference for heterosexual offences with child females being targeted by 27.6% of the participants and adult females being targeted by 23.7% of the participants (see Table 8). The choice of victim varies between the non-recidivists and the recidivists. On the choice of child male victims, there was no significant difference between the recidivists (5; 41.7%) and the non-recidivists (12; 18.8%) as recorded on the file, $\chi^2(1, \underline{N} = 74) = 3.30, \underline{p} = .07$. Selection of child male victims has been shown in the literature to be an indices of sexual deviance (Hanson & Bussière, 1998). The recidivists showed much greater diversity in victim type with 50% having recorded histories of diverse victims compared to the non-recidivists at 8%. Chi-square analysis showed that a significantly greater proportion of the recidivists displayed a propensity to diversity in victim choice over the non-recidivists, $\chi^2(1, \underline{N} = 74) = 13.97, \underline{p} = .00$. In this study diverse victim choices were seen as having both child and adult victims as well as both male and female victims.

Relationship to Victim at Index Offence

At index offence approximately 60% of the entire sample knew their victims well, offending against peers 28.9% of the time and against neighbours 25% of the time (see Table 9). This pattern of familiarity of victim was echoed in the non-recidivists at 29.7% and 26.6% and in the recidivists at 25% for each peers and neighbours. Strangers were selected as index victims

by 21.1% of the entire sample, 18.8% of the non-recidivists and 33.3% of the recidivists. Chi-square analysis reveals that this is not a significant difference. Approximately seventeen percent of the time recidivists (16.7%) offended against family members at index compared to 12.5% of the non-recidivists. Only the non-recidivists selected staff and or supervisors as victims at index and this occurred four percent (3.9%) of the time. None of the recidivists offended against staff or supervisors at index offence.

Criminal Sanction at Index Offence

Of the total sample, more than forty percent of the participants experienced no criminal sanction on the index offence. Referral for assessment and treatment services was the most frequent response of the social service network and justice systems with assistance being offered to 43.4% of the entire sample; 30 or 46.9% of the non-recidivists and three or 25% of the recidivists. Chi-square analysis showed this to be a non-significant difference between non-recidivists and recidivists, $\chi^2(1, N = 76) = 1.97$, $p = .16$. Jail and probation was the response at index offence for four or 33.3% of the participants who would eventually recidivate, a rate that is five times that of the participants who did not recidivate (4; 6.3%) resulting in a significant difference between groups, $\chi^2(1, N = 76) = 7.87$, $p = .01$. Probation alone, as a sanction was delivered equally to non-recidivists and recidivists (15.6% and 16.7% respectively).

As seen in Table 10, of the non-criminal sanctions, placing participants in institutions was the most prevalent restriction effecting 10.9% of the non-recidivists and 8.3% of the recidivists. Other consequences included being given a stern talking-to by staff or police (7.9%), receiving increased supervision (6.6%) and being moved to another community (1.3%).

Recidivism Offences

Almost 16% of this sample (12 out of 76) committed new sexual offences. The source of the recidivism information was generally verbal reports by community members, family members, or agency staff (58.4%). These reports are considered unofficial as there was no

written documentation or formal report made to police, despite the encouragement and support of the treatment agency. Further, there was often minimal written documentation on file with the agency or, at best, brief notations often questioning some aspect of the veracity of the occurrence of the offence behaviour. Arrest and conviction records were found for 33.3% of the recidivists. Another 8.3% of the recidivism information was received through formally documented reports made by agency or community members (see Table 11).

The source of the unofficial report appears to be related to the ensuing sanction for the behaviour. A large number of the recidivists (41.7%) received no official sanction for the reoffence. Sixteen point seven percent received a stern talking-to by police or agency staff and 8.3% were moved to another community (see Table 12). Three of the recidivists, or 24.9%, received jail, probation, or both. One individual was found unfit to stand trial.

In Table 13 it can be seen that victim choice differed from that of index in 58.3% of the offenders. Twenty-five percent crossed age lines, and in 16.7% of the cases, the gender of the victim was different from that at index offence. In an additional 16.7%, the gender and age of the victim differed from that at index offence.

At recidivism, the offender's relationship to the victim remained similar to that at index with 41.7% reoffending against neighbours, 33.3% against peers, and 16.7% against family members. Notably, although 33% offended against strangers at index, none of the offenders chose strangers at their recidivist offence.

The type of sexual offence varied at reoffence. Twenty-five percent touched or invited a child or teenager to touch, two or 16.7% exposed themselves, (one to a child and the other to a teen), one or 8.3% engaged in public masturbation while the majority of reoffences, five or 41.7%, involved sexual assault. Thirty-three point three percent of the sexual assaults were against adults and one or 8.3% was a teen. See Table 14.

Treatment Information

Two percent (2.6%) of the total sample refused to attend treatment, 26 individuals (34.2%) received treatment in both an institution and in the community and 48 (63.2%) received treatment in the community only (see Table 15). Interestingly, none of the recidivists had ever refused to begin treatment.

RRASOR and STATIC-99 Scales

All participants were scored, by file review, on both the RRASOR and the STATIC-99. As mentioned in the methods section, both tests were scored twice, once with the standard scoring of criminal history variables and once with a modified scoring of the criminal history variables.

As can be seen in Table 16, the recidivists scored higher than the non-recidivists on both the standard and the modified scoring of both the STATIC-99 and the RRASOR. In both cases the modified scoring (adding non-official reports of recidivism information) increased the total score for all samples on both the STATIC-99 and the RRASOR.

In Table 17, the results of t-tests, conducted to detect a significant difference between the means of the recidivistic and the non-recidivistic groups, can be observed. The lower section of Table 17 shows that using the STATIC-99, neither standard nor modified scoring, distinguished between the recidivists and the non-recidivists.

In contrast, both scorings of the RRASOR significantly distinguished between the recidivists and the non-recidivists. This would indicate that the RRASOR is better able to distinguish recidivists from non-recidivists in comparison to the STATIC-99.

An additional indication that the RRASOR distinguishes between recidivists and non-recidivists better than the STATIC-99 is seen in Table 12. In this analysis, recidivism was scored as 0 for 'no' and 1 for 'yes.' This dichotomous variable was then correlated with total scores on the RRASOR and STATIC-99, for both standard and modified scorings. As seen in

Table 18, the RRASOR (standard scoring $\underline{r} = 3.05$, $\underline{p} = .007$; modified scoring $\underline{r} = .278$, $\underline{p} = .015$) correlated significantly with recidivism while the STATIC-99 did not (standard scoring $\underline{r} = .080$, $\underline{p} = .491$; modified scoring $\underline{r} = .032$, $\underline{p} = .785$).

Discussion

Sexual offender recidivism with even low levels of sexual misbehaviour has serious consequences for people with developmental disabilities. This is more so than in the normal population as developmentally disabled people are most often subject to arbitrary decision processes within the social service network (Hayes, 1994). Even a minor sexual misbehaviour that would have no judicial consequences for a person of average IQ can result in severe restrictions of liberty, residential moves, and intrusive supervisory and treatment conditions without resort to the legal process and its procedural safeguards (Hayes, 1992; Hayes & Craddock, 1992). Conversely, significant sexual offending is routinely ignored or dealt with in non-consequential ways resulting in the individual never having to learn normative community standards (Brown & Stein, 1997; Charman & Clare, 1992). These approaches perpetuate myths and ensure the maintenance of the behaviour by not effectively dealing with the sexual offending behaviour. Further, the person with a developmental disability is not given an opportunity to learn. This is evidenced in Table 10 in this study with no sanction delivered for the index sexual offence in 43% of the total sample, 47% of the non-recidivists, and 25% of the recidivists.

The ability to accurately predict risk of sexual reoffence serves two important functions in sexual offender management. First, the assessor is provided with a sound basis for decision making on the level of support, supervision, and relevant restrictions necessary to prevent behavioural relapse and ensure the safety of the community. Secondly, empirically determined methods for assessing risk will allow for a rationalized method of apportioning assessment and treatment resources (Andrews & Bonta, 1994, 1998).

There is very little in the literature regarding developmentally disabled sexual offenders.

Presently, there are no validated risk assessments to estimate sexual offending in a population of people with developmental disabilities. This study is the first attempt at second-generation risk assessment with this population. For these reasons it is logical to look to tests that are being applied in normal samples. The RRASOR and the STATIC-99 are generally used for screening risk in normal populations. Although for the normal population, the Violence Risk Appraisal Guide (VRAG; Quinsey et al., 1998) and Sexual Offender Risk Assessment Guide (SORAG; Quinsey et al., 1998) are highly reliable in predicting new violent offences and moderately reliable in predicting new sexual offences, these instruments have not been validated on the developmentally disabled population. Indeed, there has been no validation of the SORAG to date on any population. Further, these instruments would be difficult to score as they involve use of the Psychopathy Checklist (PCL-R; Hare, 1991) which has also not been validated with this population. Also the PCL-R would be of questionable use in a population of people with significant cognitive delay.

The RRASOR and STATIC-99 are both moderately reliable in the prediction of sexual offences in the normal population. It was hypothesized that these instruments contain risk prediction variables that appear reasonable to apply to a sample of people with developmental disabilities who exhibit sexually inappropriate behaviours. The results of this study reveal that only the RRASOR differentiated between recidivists and non-recidivists. Further both versions of the RRASOR, standard and modified scoring, significantly differentiated recidivists from non-recidivists whereas the STATIC-99 did not. It should be noted that this significant difference occurred with a small sample size.

The Hanson and Bussière meta-analysis (1998) outlines the primary risk factors for sexual recidivism and it was also hypothesized that these specific predictors would apply to individuals with developmental disabilities. These researchers found the most powerful predictor of sexual offence recidivism to be phallometrically assessed deviant sexual preference

($\underline{r}$ = .32). In this study, recidivists were more likely than non-recidivists to show a deviant phallometric age or activity preference. Hanson and Bussière also found that having a stranger victim and diverse sex crimes were also significant predictors of recidivism ($\underline{r}$ = .15 and .10, respectively). In this sample, sexual recidivists were also more likely to select stranger victims and were significantly more likely to offend against diverse victim types. This meta-analysis also found that age was negatively related ($\underline{r}$ = -.13) to sex offence recidivism and indeed in this sample the recidivists were significantly younger than the non-recidivists at the start of treatment. Selection of child male victims by recidivists occurred at a rate twice that of the non-recidivists, again a predictive variable found in the meta-analysis ($\underline{r}$ = . 11). Data from this sample is clearly congruent with the findings of Hanson and Bussière, these findings support the hypothesis that principal recidivism predictors that apply to normative male samples also appear to apply in a sample of developmentally disabled men.

Potential limitations of this design include the sample size, which is small for a validation study. Conversely, there are very few people providing services for this client group and this sample is drawn from the work of the largest clinic in Canada with at least twenty years of service provision to gather this sample. It might further be stated that the discrepancy in the group sizes is of concern particularly given the small numbers in the recidivistic group. This sample, however, approximates an appropriate ratio between recidivists and non-recidivists given the length of follow-up. The mean follow-up time in this study was five years. At this five-year follow-up the long-term recidivism rates in a normal sample of sexual offenders would be expected to be approximately 18%. The recidivism rate in this study is 16%, just slightly below that in the normative sample. Hence the size of this recidivist sample is within the expected range.

It was hypothesized that the STATIC-99 would be a better predictor than the RRASOR as it takes into consideration a greater number of potential risk variables. This was not a finding

of this study. Scores on the STATIC-99 did not correlate highly with recidivism. Rather, the RRASOR scores correlated significantly with recidivism. The RRASOR appears to be the better risk assessment instrument with this population.

Though one test discriminated better that the other (RRASOR) both measures rated the recidivists, on average, more highly than the non-recidivists. This can be taken as evidence for the concurrent validity of these two measures. (See Table 16).

When adding items to a scale in a risk prediction exercise, both predictive ability and error are added. Error can overwhelm predictors if the predictors are not strong enough. Given the fact that the RRASOR and STATIC-99 are very similar tests (the STATIC-99 includes the RRASOR items) the extra items on the STATIC-99 appear to have limited utility with this sample of men. This may be due to the restricted living conditions and life experience of this sample. It may fairly be assumed that the RRASOR, with 6 fewer items, might have more generalizability across populations.

This study consists of participants who are an exceptional sample in the developmental disability literature. From the time of index offence, this population has had access to specialized assessment and treatment resources while the majority of sexual offenders with developmental disabilities do not have access to resources at all (Klimecki et al., 1994). In addition, there is an extended follow-up period, ranging to 19 years, with a recidivism rate of 16%, a reduction by approximately half that cited in other studies (Day, 1993, 1994; Klimecki et al., 1994). The nature of the services offered was based on years of accumulated knowledge on serving people with developmental disabilities who have significant sexual offending histories. The work of the therapists was further supervised by psychologists with exceptional expertise in sexual offender assessment and treatment. Therefore, it was hypothesized that the risk principle (Andrews & Bonta, 1994, 1998) would have been applied; that participants in this study would have received a level of supervision commensurate with the assessed risk level of the individual.

For example, individuals who were assessed as low-risk to reoffend would have had little or no supervision while those assessed at greatest risk would have had more intense levels of supervision. This was not the case. Levels of supervision were not delivered according to the level of assessed risk. This might be accounted for by the nature of this investigation in that the risk assessments were done retrospectively with the scores not being available to the therapist and therefore these risk assessments could not be acted upon.

The RRASOR and STATIC-99 measure risk based on historical factors. The staff did not have access to a rationally or actuarially grounded risk assessment prior to this study. Therefore, they determined risk level by clinical judgement alone. Hence, it is not surprising that they were not apportioning treatment and supervision resources according to risk. The risk level as was monitored by the therapist, and the resultant level of support and supervision was delivered based on the dynamic variables including unique factors for each specific participant. This would have included monitoring the antecedent factors prior to the offence and conditions particular to each offender. Therefore, although the participant may have been assessed with static variables as being at a high risk for reoffence, he may have been successful in treatment and was thereby accorded freedoms based on his more recent behaviours rather than those as measured by historical variables. The supervision levels of people with developmental disabilities may also be differentially delivered based on the persons' level of cognitive and adaptive skills and the supports necessary to optimize their success in their community setting.

Although there may be many reasons for the lack of alignment of treatment resources with the assessed static risk, the absence of validated assessment measures for people with developmental disabilities continues to be of concern. We know of the lack of accuracy of clinical judgement alone and the introduction of validated actuarial assessment instruments will only improve the manner in which supports are allocated. For this program that provides supervision for high-risk offenders in the community, we now know who specifically has been

assessed as high-risk and can begin to re-structure resource allocation according to the risk principle.

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Table 1

Demographics of the total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Mean age at time of coding (SD)	43.85 (14.8)	45.04 (14.6)	37.56 (14.9)
Range	18.6 to 78.2	18.6 to 78.2	19.7 to 73.8
Mean age at treatment start date (SD)	37.85 (14.4)	39.5 (13.6)	28.98 (16.3)
Range	13.8 to 72.4	13.8 to 69.1	14.0 to 72.4
Mean number of years exposed to risk (Exposure to risk while in treatment or exposure to risk) (SD)	6.00 (4.8)	5.52 (4.7)	8.58 (4.5)
Range	0.2 to 19.2	0.2 to 18.2	1.4 to 19.2
Mean age at recidivism	N/A	N/A	33.95[a] (15.0) Range 19.2 to 73.6

Note. [a]Without subject #50 the mean age at recidivism would be 30.3, standard deviation 8.8 and range would be 19.2 to 49.4 years.

Table 2

Historical living situation and abuse history of the total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Ever married or lived with a lover for > 2 years	6 (7.9%)	4 (6.3%)	2 (16.7%)
Any long-term separation from parents prior to age 16	31 (40.8%)	27 (42.2%)	4 (33.3%)
Institutionalization history			
Any history as child and adult	45 (59.3%)*	40 (62.5%)*	5 (41.7%)*
Ever as a child	28 (36.8%)*	24 (37.5%)*	4 (33.3%)*
Ever as an adult	39 (51.3%)*	34 (53.1%)*	5 (41.7%)*
Abuse History			
Physical or Emotional Abuse: Physical or Emotional Abuse	26 (34.3%)*	21 (32.8%)*	5 (41.7%)*
As an adult and child	6 (7.9%)*	6 (9.4%)*	0 (0.0%)*
As a child only	16 (21.1%)*	13 (20.3%)*	2 (16.7%)*
As an adult only	4 (5.3%)*	2 (3.1%)*	3 (25%)*
Sexual Abuse Sexual Abuse	17 (22.4%)*	15 (23.5%)*	2 (16.6%)*
As an adult and child	2 (2.6%)*	2 (3.1%)*	0 (0.0%)*
As a child only	11 (14.5%)*	10 (15.7%)*	1 (8.3%)*
As an adult only	4 (5.3%)*	3 (4.7%)*	1 (8.3%)*

Note. Those percentages with asterisks are summed to create the total.

Table 3

Current living situation and level of supervision, total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Current Living Situation (at time of coding)			
Group home	45 (59.2%)	38 (59.4%)	7 (58.3%)
Own home	12 (15.8%)	10 (15.6%)	2 (16.7%)
Family home	8 (10.5%)	7 (10.9%)	1 (8.3%)
Supported apartment	5 (6.6%)	4 (6.3%)	1 (8.3%)
Homes for special care	3 (3.9%)	3 (4.7%)	0
Temporary PPH[a]	1 (1.3%)	0	1 (8.3%)
Living with family (unrelated)	1 (1.3%)	1 (1.6%)	0
Nursing home	1 (1.3%)	1 (1.6%)	0
Type of Supervision at time of coding:			
24 hour	43 (56.6%)	39 (60.9%)	4 (33.3%)
None	15 (19.7%)	10 (15.6%)	5 (41.7%)
Some	18 (23.7%)	15 (23.4%)	3 (25%)

Note. [a]PPH is a provincial psychiatric hospital.

Table 4

Clinical Assessment of the total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Clinical Assessment: any diagnosis noted on file			
Diagnosis on file			
DD plus multiple axis	25 (32.9%)	21 (32.8%)	4 (33.3%)
DD only	21 (27.6%)	16 (25%)	5 (41.7%)
DD plus axis 1	8 (10.5%)	7 (10.9%)	1 (8.3%)
DD plus another axis 2	15 (19.7%)	13 (20.3%)	2 (16.7%)
Degree of intellectual impairment			
Borderline/Mild	(51) 67.1%*[a]	42 (65.7%)*	9 (75%)*
Borderline	21 (27.6%)*	17 (26.6%)*	4 (33.3%)*
Mild	30 (39.5%)*	25 (39.1%)*	5 (41.7%)*
Moderate	18 (23.7%)	15 (23.4%)	3 (25.0%)
Missing (No indication of intellectual functioning on file)	7 (9.2%)	7 (10.9%)	0 (0.0%)

Note. *Those percentages with asterisks are summed to create the total.

Table 5

Medication at time of coding, total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Medications at time of coding			
Total taking psychotropic and/or antiandrogen medication:	(33) 43.4%*	28 (43.8)%*	5 (41.7%)*
Medication for medical condition	9 (11.8%)	9 (14.1%)	
Psychotropic medications alone	14 (18.4%)*	11 (17.2%)*	3 (25%)*
Antiandrogens only	1 (1.3%)*	1 (1.6%)*	
Antiandrogens + medication for medical condition	1 (1.3%)*	1 (1.6%)*	
Antiandrogens + psychotropic + medical medications	2 (2.6%)*	1 (1.6%)*	1 (8.3%)*
Psychotropic + medications for medical condition	13 (17.1%)*	12 (18.8%)*	1 (8.3%)*
Psychotropic + antiandrogen medication	2 (2.6%)*	2 (3.1%)*	
No medication	34 (44.7%)	27 (42.2%)	7 (58.3%)

Note. Those percentages with asterisks are summed to create the total.

Table 6

Sexual deviance through phallometric testing, total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Sexual deviance			
Any diagnosis of deviant sexual preferences			
Phallometric assessments			
Conducted (deviant or not)	42 (55.3%)	32 (50%)	10 (83.3%)
Testing deviant for age/activity preference:	35 (46.1%)	25 (39.1%)	10 (83.3%)
No Phallometric completed	34 (44.7%)	32 (50%)	2 (16.7%)
Tested – not deviant	5 (6.6%)	5 (7.8%)	0 (0.0%)
Tested – non-valid results	2 (2.6%)	2 (3.1%)	0 (0.0%)
Tested deviant:			
Deviant age preference	25 (32.9%)	18 (28.1%).	7 (58.3%)
Deviant activity preference	5 (6.6%)	3 (4.7%)	2 (16.7%)
Deviant age and activity Preference	3 (3.9%)	2 (3.1%)	1 (8.3%)
Activity: Exhibition or Voyeurs	2 (2.6%)	2 (3.1%)	0 (0.0%)

Table 7

Behavioural History of the total sample, non-recidivists and recidivists

History of Sexual and Non-Sexual Violence

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Number of prior significant behavioural incidents (sexual and non-sexual)			
Some history of behavioural incidents	73 (96.1%)	61 (95.3%)	0 (0.0%)
None	3 (3.9%)	3 (4.7%)	0 (0.0%)
More than twenty	7 (9.2%)	5 (7.8%)	2 (16.7%)
More than five	25 (32.1%)	22 (34.4%)	3 (25%)
Three to five	21 (27.6%)	17 (26.6%)	4 (33.3%)
Less than three	20 (26.3%)	17 (26.6%)	3 (25%)
History of nonsexual violence			
History of non-sexual violence with no convictions	28 (38.8%)	35 (39.1%)	3 (25%)
Convictions for non-sexual violence	9 (11.8%)	9 (14.1%)	0 (0.0%)
No history	39 (51.3%)	30 (46.9%)	9 (75%)

Table 8

Victim choice of the total sample, non-recidivists and recidivists

Sexual offence history

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Victim Choice			
Ever offended against (%)			
Child Female	21 (27.6%)	17 (26.6%)	4 (33.3%)
Adult female	18 (23.7%)	14 (21.9%)	4 (33.3%)
Child Male	17 (22.3%)	12 (18.8%)	5 (41.7%)
Adult male	6 (7.9%)	5 (7.8%)	1 (8.3%)
Teen female	6 (7.9%)	5 (7.8%)	1 (8.3%)
Teen male	6 (7.9%)	4 (6.3%)	2 (16.7%)
Diverse victim types (age/sex) (n = 7)	11 (14.9%)	5 (8.0%)	6 (50.0%)
Exhibitionism	2 (2.6%)	2 (3.1%)	0 (0.0%)

Table 9

Relationship to Victim at Index Offence

Comparison of the total sample, non-recidivists and recidivists on static, historical variables

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Relationship to victim at index offence			
Number of extrafamilial victims well known to the perpetuator	59.2%*		
Peers	22 (28.9)*	19 (29.7%)	3 (25%)
Neighbours	19 (25%)*	16 (25%)	3 (25%)
Stranger	16 (21.1%)	12 (18.8%)	4 (33.3%)
Family	10 (13.2%)	8 (12.5%)	2 (16.7%)
Supervisor/boss/staff	3 (3.9%)	3 (3.9%)	0
Peers and neighbourhood children	4 (5.3%)*	4 (6.3%)	0
Other (child)[a]	1 (1.3%)	1 (1.6%)	0
Unknown	1 (1.3%)	1 (1.6%)	0

Note. Those percentages with asterisks are summed to create the total.
[a]Staff's child brought into the group living situation.

Table 10

Index Criminal Sanction of the total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Criminal Sanction at Index Offence			
No sanction delivered:			
No Sanction – referred for assessment and treatment	33 (43.4%)	30 (46.9%)	3 (25%)
Criminal sanction delivered:			
Jail and probation	8 (10.5%)	4 (6.3%)	4 (33.3%)
Probation	12 (15.8%)	10 (15.6%)	2 (16.7%)
Jail	0	0	0
Conditional sentence plus probation	1 (1.3%)	1 (1.6%)	0
No charges but 810 order	1 (1.3%)	1 (1.6%)	0
Non-criminal sanction delivered:			
Institutionalized	8 (10.5%)	7 (10.9%)	1 (8.3%)
Stern talking to (staff or police)	6 (7.9%)	5 (7.8%)	1 (8.3%)
More restrictive environment ie. More supervision	5 (6.6%)	4 (6.3%)	1 (8.3%)
Moved to another community	1 (1.3%)	1 (1.6%)	
Suspended from school	1 (1.3%)	1 (1.6%)	0

Table 11

Recidivism Offences: comparison of total sample, non-recidivists and recidivists

Source of Recidivism Information and Relationship to Victim at Re-Offence

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Reporting:			7 (58.4%)*
Source of Recidivism data			
Arrested and convicted			4 (33.3%)
Family member			2 (16.7%)*
Documented agency or community report			1 (8.3%)
Unofficial community or agency report			5 (41.7%)*

Note. Those percentages with asterisks are summed to create the total.

Table 12

Recidivism Offences: comparison of total sample, non-recidivists and recidivists

Criminal Sanction on re-offence

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Criminal Sanction at Reoffence			
No sanction delivered:			
Nothing happened	N/A	N/A	5 (41.7%)
Stern talking to	N/A	N/A	2 (16.7%)
Moved to another community	N/A	N/A	1 (8.3%)
Criminal sanction delivered:			
Experiencing criminal sanction:			24.9%*
Jail	N/A	N/A	1 (8.3%)*
Probation	N/A	N/A	1 (8.3%)*
Jail and probation	N/A	N/A	1 (8.3%)*
Unfit to stand trial	N/A	N/A	1 (8.3%)*
Non-criminal sanction delivered:			
Institutionalized	N/A	N/A	0 (0.0%)

Note. Those percentages with asterisks are summed to create the total.

Table 13

Recidivism Offences:

Victim Type Compared to Index Offence and Relationship to Victim at Re-Offence

Measure	Recidivists
Sample Size	12
Victim same or different from index	
Victim different from index	7 (58.3%)
Crossed age lines	3 (25%)
Crossed gender only	2 (16.7%)
Crossed gender and age	2 (16.7%)
Victim same as index	5 (41.7%)
Relationship to victim:	
Community member – neighbour	5 (41.7%)
Peers	4 (33.3%)
Family	2 (16.7%)
Supervisor/boss/staff	1 (8.3%)
Stranger	0

Table 14

Recidivism Offences:

Type of Sexual Offence

Measure	Recidivists
Sample Size	12
Type of sexual offense	
Touch or invitation to touch (child or teen)	3 (25%)
Exposition	2 (16.7%)
Exposure to child	1 (8.3%)
Exposure to teen	1 (8.3%)
Public masturbation	1 (8.3%)
Sexual assault	5 (41.7%)
Against adults	4 (33.3%)
Against teens	1 (8.3%)

Table 15

Treatment information for the total sample, non-recidivists and recidivists

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
Ever attended treatment			
Refused treatment	2 (2.6%)	2 (3.1%)	0
Treatment in both community and institution	26 (34.2%)	23 (35.9%)	3 (25%)
Treatment in community only	48 (63.2%)	39 (60.9%)	9 (75%)

Table 16

RRASOR and Static – 99 Scales: Standard and Modified Scoring

Comparison of the total sample, non-recidivists and recidivists on static, historical variables

Measure	Total Sample	Non-Recidivists	Recidivists
Sample Size	76	64	12
STATIC – 99			
Mean standard scoring (SD)	4.39 (1.48)	4.34 (1.55)	4.67 (1.07)
Range	1 to 10	1 to 10	3 to 7
Mean modified scoring (SD)	5.54 (1.74)	5.52 (1.81)	5.67 (1.37)
Range	1 to 10	1 to 10	4 to 8
Rapid Risk Assessment of Sex Offender Recidivism (RRASOR)			
Mean standard scoring (SD)	2.13 (0.88)	2.02 (0.85)	2.75 (0.87)
Range	1 to 4	1 to 4	1 to 4
Mean modified scoring (SD)	3.17 (1.17)	3.03 (1.17)	3.92 (0.90)
Range	1 to 6	0 to 6	3 to 6

Table 17

Total Sample – Recidivists vs. Non-recidivists

Independent Samples T-Tests

	Participants	Number	Mean	Standard Deviation
Static-99 Score Standard Scoring Version	Recidivists	12	4.67	1.07
	Non-recidivists	64	4.34	1.55
Static-99 Score Modified Version	Recidivists	12	5.67	1.37
	Non-recidivists	64	5.52	1.81
RRASOR Score Standard ScoringVersion	Recidivists	12	2.75	.87
	Non-recidivists	64	2.02	.85
RRASOR Score Modified Scoring Version	Recidivists	12	3.92	.90
	Non-recidivists	64	3.03	1.17

Variable	t-value	Significance level (2-tailed)
Static-99 Score Standard Scoring Version	$t = 0.691$	.491
Static-99 Score Modified Scoring Version	$t = 0.274$	.785
RRASOR Score Standard Scoring Version	$t = 2.752$	.007
RRASOR Score Modified Scoring Version	$t = 2.486$	.015

Table 18

Correlation of Total Scores on the Rapid Risk Assessment of Sex Offender Recidivism (RRASOR) and Static-99

Standard and Modified Scoring Versions with Recidivism, scored as a Dichotomous Variable

Correlation Matrix (N = 76)

	Recidivism Variable Scored yes = 1, no = 0
RRASOR Total Score Standard Scoring	r = .305 p =.007
RRASOR Total Score Modified Version	r = .278 p =.015
Static-99 Total Score Standard Scoring	r = .080 p =.491
Static-99 Total Score Modified Version	r = .032 p =.785

Appendix A

York Central Hospital, Behaviour Management Services, Information Consent Forms

York Central Hospital

Behaviour Management Services
13270 Yonge Street, Unit 101, Richmond Hill, Ontario L4E 2T2
Tel: (905) 773-2362 Fax: (905) 773-8499

BEHAVIOUR MANAGEMENT SERVICES **INFORMATION CONSENT**

NAME OF CLIENT: _____

ADDRESS: _____

DATE OF BIRTH: _____

Involvement with Behaviour Management Services entails the authorized use and disclosure of pertinent client information in the following areas:

- Consulting with our clinical psychologists, psychiatrists and other professionals involved with our agency for the purpose of making recommendations and providing guidance.
- Conducting research, presenting educational materials and compiling administrative and empirical statistics with the condition of anonymity and compliance with the hospital's policies.

[ ] **RELEASE OF INFORMATION**

I hereby authorize Behaviour Management Services to release any social, educational, psychological, medical and other pertinent data from agency, physician and/or hospital as may be necessary or desirable for the care or treatment of the above named.

[ ] **EXCHANGE OF INFORMATION**

I hereby authorize Behaviour Management Services to maintain ongoing contact with the following agencies or professionals regarding the above named:

AGENCIES OR PROFESSIONALS TO WHOM INFORMATION CAN BE RELEASED:

1. _____
2. _____
3. _____

All information obtained will be kept strictly confidential between parties listed above. Information will not be released or exchanged to any other party without prior written consent or signed Form 14 consent from client or guardian.

Confidentiality will be broken if there is concern for the client's physical and/or emotional status in an emergency situation, or if the safety of others or the community becomes an issue.

Note: This consent is valid for one year from the signature date, unless file closure occurs prior to this date.

_____ _____
Witness Signature

_____
(If other than the client, state relationship to the client)

Dated the _____ day of _____, 19_____.

BEHAVIOUR MANAGEMENT SERVICES
13270 YONGE STREET, SUITE 101
RICHMOND HILL, ONTARIO
L4E 2T2

INFORMATION CONSENT

NAME OF CLIENT: _____

ADDRESS: _____

DATE OF BIRTH: _____

[ ] RELEASE OF INFORMATION

You are hereby authorized to release any social, educational, psychological, medical, and other pertinent data from agency, physician and/or hospital as may be necessary or desirable for the care or treatment of the above named.

[ ] EXCHANGE OF INFORMATION

I hereby authorize Behaviour Management Services to maintain ongoing contact with the following agencies or professionals regarding the above named.

[ ] OTHER (Specify)

AGENCIES OR PROFESSIONALS TO WHOM INFORMATION CAN BE RELEASED:

1. _____
2. _____
3. _____

All information obtained will be kept strictly confidential between parties above. Information will not be released or exchanged to any other party without prior written consent from client, parent or guardian.

_____ _____

Signature of Client/Parent/Guardian **Date**

Consent is valid for one year from the signature date, unless file closure occurs prior to this date.

Appendix B

Consent to Participate in a Research Project

York Central Hospital

Behaviour Management Services
13270 Yonge Street, Unit 101, Richmond Hill, Ontario L4E 2T2
Tel: (905) 773-2362 Fax: (905) 773-8499

Consent to Participate in a Research Project

The reason for this research is to see whether two risk assessments that are useful with men without developmental disabilities can be helpful with men who have a developmental disability. The risk assessments are made up of a list of questions we ask to help us understand whether someone who has had problems with sexual behaviours in the past might have similar problems again. It is expected that by doing this research we will be able to better match the kind of help or treatment we offer to the needs of men with developmental disabilities.

The research will involve Susan Tough, the Director of Behaviour Management Services, reading your file and recording some information from it. This is something that the Director has always been able to do this but, as this is a research study, it is important that you know all about it. This study is part of what Susan is doing to for her Masters degree through the Ontario Institute for Studies in Education at the University of Toronto.

It is okay if you decide that you do not want to be part of this research. Whatever your decision you can be sure that you will receive the best help we have to offer from Behaviour Management Services.

Expected benefits, discomforts and risks

Benefits: We hope that this study will give Behaviour Management Services tools to better understand the way we can help you best. Once the study is done, we hope to be able to say how we can give you better treatment and supervision. However, this will take about 4 months to figure out as we have to collect all the information and look at it in detail.

Discomforts and risks: It is not expected that you will experience any discomfort or risk, as you will never be identified as someone who was part of this study. Your name will not be reported in the research. Your name will be replaced with a code or number so we can keep the information organized while not having your name next to it. Once all the information is put together there will be a report

written to talk about what was learned in the study. To protect your privacy, the report will not talk about you or any individual.

We would like you to ask anything you want know about the research and we will tell you everything we can.

The choice is up to you; you can say yes or no to this study. Even if you decide today that you will be part of the study you can change your mind at any time and say that you no longer want to be part of the study. No matter what you decide you will still get all the help that Behaviour Management Services can give you.

This form has been read to me by_____
(name of staff)

at _____ (place) on_____, 200_ (date).

When the study is finished I understand that I can ask Susan to tell me what was learned by doing the research. I can reach her at (905) 773-2162.

By signing I agree to take part in the research project. Any questions I have have been answered so that I feel okay about participating.

Client Name: _____

Witness: _____

Appendix C

York Central Hospital, Institutional Review Board, Clinical Trial Review Committee

york central hospital

10 TRENCH STREET - RICHMOND HILL - ONTARIO

L4C 4Z3 TELEPHONE 883-1212

July 13, 2000

Susan Tough,
Behavior Management
York Central Hospital

RE: MEMBERSHIP OF INSTITUTIONAL REVIEW BOARD

The Clinical Trial Review Committee, acting as the Institutional Review Board (IRB) at York Central Hospital consists of the following members:

Dr. P. Zelina - Psychiatrist
Dr. David Wortzman – Emergency
Dr. M. Richmond – Internist - Cardiology
Dr. Michael Sugai – Internist – Rheumatology
Dr. Alan Kaplan – Family Practice Physician
Clare Johnson – Director, Diagnostic Services
Eva Ko – Director, Pharmacy Services
Ainsley Lee – Chair, Ethics Committee
Anne Fu – Nurse Educator, Member, Ethics Committee
Bob Johnson – Community Member

Dr. P. Zelina
Chairman, Clinical Trial Review Committee

york central hospital

10 TRENCH STREET - RICHMOND HILL - ONTARIO

L4C 4Z3 TELEPHONE 883-1212

July 13, 2000

Susan Tough
Behavior Management Program
York Central Hospital

RE: **Validation of two standard risk assessment (RRASOR 1997; Static – 99, 1999) on a sample of males who are developmentally disabled.**

The Clinical Trial Review Committee, acting as the Institutional Review Board (IRB) at York Central Hospital has reviewed the clinical trial protocol and consent form submitted on June 23, 2000, approved the consent form and the participation of York Central Hospital in the validation of two standard risk assessment trial.

Dr. P. Zelina
Chairman, Clinical Trial Review Committee

Appendix D

The Development of a Brief Actual Risk Scale for Sexual Offense Recidivism

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The Development of a Brief Actuarial Risk Scale for Sexual Offense Recidivism

1997-04

By

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Department of the Solicitor General of Canada

Public Works and Government Services Canada
Cat. No. JS4-1/1997-4E
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Abstract

Estimating a sexual offender's recidivism risk is important to many areas of the criminal justice system. The present study used data from seven different follow-up studies to develop a brief, actuarial risk scale, which was then replicated on an additional independent sample (total sample size of 2,592). The scale contains four items that are easily scored from administrative records: prior sexual offenses, age less than 25, extrafamilial victims and male victims. The scale showed moderate predictive accuracy (r = .27, ROC area = .71) with little variation between the development and replication samples. The predictive accuracy of the scale was sufficient to justify its use as a screening instrument in settings that require routine assessments of sexual offender recidivism risk.

The development of a brief actuarial risk scale for sexual offense recidivism

Many decisions in the criminal justice system are influenced by judgements concerning the offenders' risk for recidivism. Offenders routinely receive harsher or more lenient treatment depending on the extent to which lawyers, judges, police, expert witnesses and correctional officers perceive the offenders to represent a continued threat to community safety. Risk assessments are important for all offenders, but are particularly important for sexual offenders, who may become the targets of exceptional interventions if judged to be a continuing risk (e.g., post-sentence detention, community notification, lifetime community supervision).

The prediction of future behaviour can never be done with certainty since people and circumstances can and do change. Nevertheless, there is agreement that it is possible to predict general criminal recidivism with at least moderate accuracy (Andrews & Bonta, 1994; Gendreau, Little & Goggin, 1996). The factors most strongly related to general recidivism include a history of criminal behaviour, being young, having criminal associates, and having characteristics of antisocial personality/psychopathy (Gendreau et al., 1996). The best predictions of future criminal involvement have been made with objective risk scales that include combinations of such factors (e.g., Level of Service Inventory - Revised, Andrews & Bonta, 1995; the Wisconsin system, Baird, 1981). These objective risk scales not only specify what should be considered when conducting risk assessments, but they also assigns weights as to the relative importance of the risk factors.

Objective criminal risk scales have worked quite well at predicting general and non-sexual violent recidivism among sexual offenders (Bonta & Hanson, 1995b; Motiuk & Brown, 1993). Risk scales designed for general offenders, however, have not been effective in predicting sexual recidivism. Bonta and Hanson (1995b), for example, found that among a group of 315 federally sentenced sexual offenders, the SIR scale (Bonta, Harman, Hann & Cormier, 1996) correlated .34 with non-sexual violent recidivism, .41 with general (any) recidivism, but only .09 with sexual recidivism.

Hanson and Bussière's (1996) recent review has suggested that sexual recidivism can be predicted by a different set of factors than those that predict general or non-sexual violent recidivism (see also Hanson & Bussière, in press). They found that although general criminological variables, such as age and prior offenses, showed some relationship with sexual offense recidivism, the strongest predictors of sexual offense recidivism were variables related to sexual deviance (e.g., prior sexual offenses, deviant sexual interests and activities). They also found that sexual recidivism was related to specific victim characteristics (e.g., male victims, unrelated victims). Given that many of the exceptional legal procedures are concerned only with the risk of sexual reoffending, separate procedures should be used to evaluate an offender's risk for sexual and for non-sexual recidivism.

There have been few attempts to develop objective risk scales specifically for sexual offense recidivism. Several studies have used statistical techniques (such as stepwise regression) to identify the best combination of predictor variables within a single sample (e.g., Abel, Mittelman, Becker, Rathner & Rouleau, 1988; Barbaree & Marshall, 1988; Hanson, Steffy & Gauthier, 1993a; Prentky, Knight & Lee, 1997; Quinsey, Rice & Harris, 1995; Smith &

Monastersky, 1986). Without replication, however, it is difficult to determine how well the best predictors identified in any single sample should generalize to other populations.

Epperson, Kaul, and Huot (1995) are among the few researchers who have developed a sexual recidivism risk scale on one sample and then tested its validity on an entirely new sample. Their original scale contained 21 items related to sexual and non-sexual criminal history, substance abuse, marital status, and treatment compliance. In the replication sample, the scale correlated .27 with sexual offense recidivism. However, many of the individual items did not correlate significantly with sexual recidivism and the scale is currently being revised. An additional concern was that Epperson et al. (1995) attempted to maximize the predictive accuracy by selecting approximately equal proportions of recidivists and nonrecidivists. Consequently, it is difficult to tell how well the Epperson et al. (1995) scale would predict recidivism given the much lower base rates found in naturalistic contexts.

Her Majesty's Prison Service (UK) has also developed a brief scale for assessing risk for sexual offense recidivism (David Thornton, personal communication, March 11, 1997). The scale categorizes offenders into three risk levels (low, medium, high) based on sexual and non-sexual criminal convictions, and the type of victim in the sexual offenses (males, strangers). The scale was developed to predict both sexual and violent recidivism; nevertheless, in a replication sample drawn from the UK prison population, the scale correlated .33 with sexual offense recidivism (David Thornton, personal communication, March 11, 1997). This result is encouraging, but further work is required to determined the extent to which the scale generalizes to other settings.

The Violence Risk Appraisal Guide (VRAG; Webster et al., 1994) has attracted considerable attention as an objective risk assessment procedure (e.g., Borum, 1996). The VRAG was developed to assess violent recidivism among mentally disordered offenders, but subsequent research has suggested that the scale appears to apply equally to their subsample of sexual offenders (Rice & Harris, 1997). Careful reading of the research, however, indicates that the VRAG predicts general violent recidivism (including sexual; $r = .47$) much better than it predicts sexual recidivism ($r = .20$; Rice & Harris, 1997, Table 2). For comparison, Hanson and Bussière's (1996) quantitative review found that the single item, "history of prior sexual offenses", correlated .19 with sexual offense recidivism. Consequently, it is unlikely that assessors concerned with cost and efficiency would be interested in using the VRAG as a measure of sex offense recidivism risk, given the VRAG's substantial resource requirements (i.e., professionally trained interviewers and careful file review).

There remains a need for a brief, efficient actuarial tool that could be used to assess the risk for sexual offense recidivism. The present research was intended to fill this gap using data from eight different sexual offender follow-up studies. Seven of these studies were used to develop a risk scale that was then cross-validated on an independent data set. The scale development strategy was guided by the dual concerns of empirical validity and ease of administration. First, a sample of easily scored risk predictors were drawn from Hanson and Bussière (1996). Next, the intercorrelations of these variables were computed for each of the seven data sets. These correlations were then averaged into a single correlation matrix. The best predictors of sexual offense recidivism were then selected using stepwise regression on this averaged correlation matrix. The best predictors were then translated into a easily scored risk

scale, and the predictive validity was then tested on an independent sample. The procedure was not intended to maximize prediction for each sample; instead, the aim was to develop an easily administered scale that was likely to be valid for a range of settings.

Method

Potential predictor variables. The initial pool of predictor variables was selected from Hanson and Bussière's (1996) meta-analysis. The variables selected were those that had an average correlation of at least .10 with sexual offense recidivism, and that could be scored using commonly available information (e.g., offense history, police reports, demographic characteristics). If several variables were expected to be highly correlated with each other (e.g., never married/currently married) only the variable with the highest correlation was selected. The initial list of predictor variables is displayed in Table 1.

The next step was creating common operational definitions of each the predictor variables. In Hanson and Bussière (1996), the coding of the variables depended on the coding in the original studies. Age, for example, was sometimes analyzed as a continuous variable, and sometimes dichotomously (with various cut-points). Consequently, it was necessary to create common definitions that could be used to determine understandable cut-points (e.g., what age is young?). These definitions were created based on an informal examination of the variables distributions, and of their correlations with sexual offense recidivism.

Table 1.

Predictor variables selected from Hanson & Bussière's (1996) meta-analysis.

Variable	average r	sample size/n of studies
Prior sex offenses	.19	11,294/29
Any stranger victims	.15	465/ 4
Any prior offenses	.13	8,683/20
Age (young)	.13	6,969/21
Never married	.11	2,850/ 8
Any non-related victims	.11	6,889/21
Any male victims	.11	10,294/19

The specific definitions were as follows:

Prior sex offenses. This variable counted the number of sexual offenses that were officially recorded prior to the index offense. Self-reported sexual offenses were not included, nor were charges/convictions related to the index offense. Since not all arrests result in convictions, the coding scheme placed relatively more weight on convictions. The coding was as follows: '0' - no prior convictions or arrests for sexual offenses; '1' - one prior conviction, or 1-2 prior arrests; '2' - two or three prior conviction, or 3-5 prior arrests; and '3' - four or more prior convictions, or six or more prior arrests.

For example, an offender was charged in 1990 with two counts of sexual assault, but neither resulted in a conviction. In 1994, he was charged with another three counts of sexual assault and convicted on one (his index offense for which he is currently serving time). In this case, the offender would receive a score of "1" for the two prior charges.

Any prior non-sexual offenses. Included in this category were any arrests or convictions for non-sexual offenses (violent or non-violent). These included non-sexual offenses related to the index offense. The coding was as follows: (any = '1') and (none = '0'). This variable had a slightly different definition than the "any prior offense" category coded by Hanson and Bussière (1996), which included both prior non-sexual offenses and the total prior offenses (including sexual).

Any stranger victims. A stranger was someone who had no real relationship with the offender prior to the offense (less than that of an acquaintance). The coding was as follows: (any stranger victims = '1') and (none = '0').

Age. This variable measured age when exposed to risk (at time of release for incarcerated offenders; when evaluated for those in the community). For the purpose of this study, offenders less than 25 years of age were considered young: (less than 25 = '1') and (25 and older = '0').

Never married. This category included both legal marriages and common-law relationships (including homosexual): (never married/common-law = '1') (ever married/common-law = '0').

Any non-related victims. Related victims included the full range of biological and step-relations (e.g., biological and step-children, nieces, cousins, siblings, parents). As well, this category included a small number of cases involving victims who were living with the offender as a family member (e.g., foster children). The coding was as follows: (any non-related victims = '1') (only related victims = '0').

Any male victims. Those who had ever offended against a male victim (adult or child) were coded '1', and never equaled '0'.

Recidivism outcome variable. The recidivism outcome variable was any new sexual offense as indexed by official records (arrests, convictions, re-admissions). Non-sexual violent recidivism was not included since previous research has suggested that non-sexual recidivism may be predicted by different factors than sexual recidivism (Hanson & Bussière, 1996). The specific methods used to index recidivism varied somewhat across studies; however, these methods were controlled within each study since the same definitions and follow-up periods were used for both the recidivists and nonrecidivists. Other research (Hanson & Bussière, in press) has suggested that the same predictor variables apply to different methods of defining recidivism (e.g., conviction versus arrest), even though different recidivism criteria can have substantial influence on the overall recidivism rates (Prentky, Lee, Knight & Cerce, in press).

Samples. Seven different follow-up studies were used in the development of the risk scale and a separate independent sample was used for validation (see Table 2). The development samples were selected because they represented a range of settings in which risk assessments for sexual offenders are often conducted (correctional institutions, specialized treatment programs, secure mental health facilities). The validation sample was selected because it contained a complete set of variables, a sufficient sample size (303), and a long follow-up period (16 years). As well, the fact that it was based in a different setting (England and Wales) from the other studies (based in the USA or Canada) provides a strong test of generalizability of the findings.

Since the individual studies have been described in previous publications, only a brief outline will be presented below. All the studies used longitudinal designs in which a number of different variables were used to predict subsequent sexual recidivism. Most of the studies included all of the variables listed in Table 1; the missing variables are noted below in the descriptions of each sample.

The studies varied in terms of follow-up periods, recidivism criteria, and legal jurisdictions, but these factors were matched for both the recidivists and nonrecidivists within each study. All the studies used mixed groups of sexual offenders, except the Millbrook follow-up study (Hanson, Steffy & Gauthier, 1993b), which only examined child molesters. All the subjects were adult males.

Development samples.

Millbrook Recidivism Study (Hanson et al., 1993b; see also Hanson, Scott & Steffy, 1995; Hanson, Steffy & Gauthier, 1992; Hanson et al., 1993a). This study collected long-term recidivism information (15-30 years) for child molesters released between 1958 and 1974 from Millbrook Correctional Centre, a maximum security provincial correctional facility located in Ontario, Canada. About half of the sample went through a brief treatment program. For the treatment sample, the information concerning the predictors was collected from their clinical files, whereas for the remainder of the sample, the information was extracted from their correctional files. Information was available on all the relevant predictor variables. Recidivism information was coded from national records maintained by the Royal Canadian Mounted Police (RCMP).

Canadian Federal Recidivism Study - 1983/1984 Releases (Bonta & Hanson, 1995a; see also Bonta & Hanson, 1995b). This study examined the 316 sexual offenders included in the complete sample of 3,180 federal offenders released by the Correctional Service of Canada in 1983/1984. Sexual offenders were defined as those who were released following any sexual conviction. Recidivism information was collected in 1994 using RCMP records. The predictor variables available were those recorded from correctional files for use in previous studies on the prediction of recidivism within general criminal populations (Hann & Harman, 1992a; 1992b). Since the study was designed for general offenders (not sex offenders), the only predictor variables available were age at release, marital status, prior sexual offense, and prior nonsexual offenses. Consequently, this sample was used to develop the average correlation matrix of predictors, but was not used to test the resulting risk scale.

Table 2

Study characteristics

Study	Sample size	age (years)	% rapists	average follow-up in years	recidivism rate	sex offense recidivism criteria
Development samples						
Millbrook, Ontario	191	33.1	0.0	23	.35	Convictions
Canadian Federal 1983/84 releases	316	30.5	n/a	10	.20	Convictions
Institut Philippe Pinel	382	36.2	29.6	4	.15	Convictions
Alberta Hospital Edmonton	363	35,5	23.1	5	.06	Charges
SOTEP (California)	1138	37.6	27.6	5	.12	Charges
Canadian Federal 1991/1994 releases	241	36.8	56.0	2	.07	Charges
Oak Ridge (Penetang)	288	30.4	50.7	10	.35	Charges/readmissions
Validation sample						
HM Prison Service (UK)	303	34.3	18.7	16	.25	Convictions

Institut Philippe Pinel (Montreal). (Proulx, Pellerin, McKibben, Aubut & Ouimet, 1995; see also Proulx, Pellerin, McKibben, Aubut & Ouimet, 1997; Pellerin, Proulx, Ouimet, Paradis, McKibben, & Aubut, 1996). This study focused on sexual offenders treated at a maximum security psychiatric facility between 1978 and 1993. The Institut Philippe Pinel provides longterm (1-3 years) treatment for sexual offenders referred from both the mental health and correctional systems. Information concerning predictor variables was drawn from their clinical files and recidivism information from RCMP records collected in 1994. Information was available on all the predictor variables except stranger victims.

Alberta Hospital Edmonton - Phoenix Program. (Reddon, 1996; see also Studer, Reddon, Roper & Estrada, 1996). The sexual offenders in this study were drawn from those treated at the Phoenix (Alberta Hospital Edmonton) program between 1987 and 1994. The Phoenix program is an eclectic inpatient treatment program that receives most of its referrals from federal correctional facilities. Information concerning predictor variables were coded from clinical files and recidivism information was collected in 1995 using RCMP records. Information was available for all the relevant predictor variables.

California's Sex Offender Treatment and Evaluation Project (SOTEP). (Marques & Day, 1996; see also Marques, Day, Nelson & West, 1993; Marques, Nelson, West & Day, 1994). The primary aim of this ongoing study is to examine the efficacy of treatment. The sample used in the current study included sexual offenders randomly assigned to treatment (n = 172), matched volunteer controls, treatment refusers, as well as a general sample of sexual offenders from the California correctional system (total sample of 1138). Men who had offended only against their biological children were not included in the study. Subjects were admitted to this study between 1985 and 1995; follow-up information was based on local and national criminal record searches conducted in 1995. Information was available for all the predictors variables except prior nonsexual offenses.

Canadian Federal 1991/1994 Releases (Motiuk, 1995; see also Motiuk & Brown, 1993; Motiuk & Brown, 1996). This study followed a group of sexual offenders released by the Correctional Service of Canada between 1991 and 1994. The offenders in this group were those who were reviewed in 1991 (see Motiuk & Porporino, 1993) while they were still incarcerated. Follow-up information was coded from 1994 RCMP records. Information was available for all the predictor variables except number of prior nonsexual offenses.

Oak Ridge Mental Health Centre, Penetanguishene, Ontario (Penetang). (Rice & Harris, 1996; see also Quinsey et al., 1995; Rice & Harris, 1997; Rice, Harris & Quinsey, 1990; Rice, Quinsey & Harris, 1991). The Penetang study followed sexual offenders referred for treatment and/or assessment to a maximum security mental health centre between 1972 and 1993. The majority of the referrals came from the mental health systems or the courts (e.g., pretrial fitness examinations), with a minority of cases coming from provincial or federal corrections. Follow-up information was based on RCMP records as well as mental health records (i.e., new admissions for sexual offenses, whether or not new charges were laid). Information was available for all the predictor variables; however, relationship to victim was only available for the most serious offense.

Replication sample.

Her Majesty's Prison Service (UK). (Thornton, 1997). The study provided a 16 year follow-up of 303 sexual offenders released from Her Majesty's Prison Service (England and Wales) in 1979. Recidivism information was based on Home Office records collected in 1995. Very few of the offenders in this sample would have received specialized sexual offender treatment. Recidivism was defined as a new conviction for a sexual offense. Information was available for all the relevant predictor variables, with the exception that relationship to victim was only available for the index offense.

Analytic strategy. The goal of the analysis was to identify the best subset of nonredundant predictors or sex offense recidivism. These variables could then be combined into an easily scored risk scale. The first step was to calculate the intercorrelations of the predictor variables within each of the seven development data sets. The correlation coefficient, r, was used as a measure of association since it is easily understood and the statistical procedures for aggragating rs are well documented (Hedges & Olkin, 1985; Rosenthal, 1991). Next, following Becker (1996), the individual correlations in each study were combined to create an averaged correlation matrix. The specific methods used for aggregating the correlations were those of Hedges and Olkin (1985). The averaged correlation matrix was then analyzed using stepwise regression. In order to minimize trivial effects, the sample size was artificially reduced to 1,000 with p to entry of .05. (The average sample size per correlation was 2,145). With these parameters, variables whose beta weights were less than .06 were considered non-significant.

The advantages of analyzing the averaged correlation matrix were that a) it combines the information from all the studies into a single analysis, and b) it generates large enough samples sizes to minimize the small random fluctuations to which stepwise regression are so sensitive (Pedhazur, 1982). Statisticians may argue about the appropriateness of applying standard regression analyses to averaged correlation matrices since the findings are nested across studies, and the studies had different sample sizes, and, therefore, different standard errors (Hedges & Olkin, 1985). As well, the use of stepwise regression could be questioned since the results of stepwise analyses are often unstable (Pedhazur, 1982). In the context of the present study, however, the use of the regression analyses acted only as a heuristic to identify a set of potentially useful predictors that could be combined into an easily scored risk scale. The most important stage of the analysis tested the predictive accuracy of the resulting scale.

Index of predictive accuracy. Two measures were used to describe the predictive accuracy of the risk scale: a) r, the correlation coefficient, and b) the area under the receiver operating characteristic (ROC) curve (Hanley & McNeil, 1982). ROC curves are the plot of the number of accurately identified recidivists, "hits", against the falsely classified nonrecidivists, "false alarms", for each value of the prediction scale. The area under the ROC curve can vary from .50 (chance prediction) to 1.0 (perfect prediction). The area can be interpreted as the probability that a randomly selected recidivist will have a more deviant score than a randomly selected nonrecidivist. ROC statistics have been recommended for assessing predictive validity since they are easily interpreted and are not influenced by base rates (Mossman, 1994; Rice & Harris, 1995). Metz, Shen and Wang's (1989) ROCFIT program was used to compute the ROC statistics (areas and variances).

McClish's (1992) procedures were used to compare ROC areas across studies. Specifically, the average area was computed as follows: $\tilde{A} = \Sigma W_i A_i / \Sigma W_i$, were $\tilde{A}$ is the average area, A_i is the area for each study and $W_i = 1/Var(A_i)$. The test of homogeneity across studies was follows: $\chi^2 = \Sigma W_i(A_i - \tilde{A})$, where the resulting χ^2 is tested with degrees of freedom equal to one less than the total number of samples.

Results

The first stage of the analysis involved generating an averaged correlation matrix (see Table 3). The sample size varies somewhat for each correlation due to missing data (range of 628 to 2880, with an average of 2,145). For most of the averaged correlations (68%), there was no significant variability across the studies. Due to the large sample sizes, all of the correlations greater than |.04| were statistically significant ($p < .05$, two-tailed).

All of the predictor variables were significantly correlated with sexual offense recidivism. Many of the effects, however, were rather small. The strongest individual predictors were a history of prior sexual offenses ($r = .20$) and having extrafamilial victims (.14). The weakest predictor was prior nonsexual offense ($r = .06$, $p < .05$). The other predictors (age, marital status, stranger victims, male victims) had correlations in the .10 to .12 range. The magnitudes of the correlations were very similar to those previously found (see Table 1).

The predictor variables tended not to be highly correlated with each other (.10 to .20 range). The exceptions were the relatively high correlations between having stranger victims and extrafamilial victims ($r = .49$), having intrafamilial victims and being married ($r = .32$), and being young and being single ($r = .28$). These correlations were to be expected since familial victims tend to be children, and stranger victims would also qualify as extrafamilial victims.

Although not the focus of this study, the correlation matrix can also be used to infer certain patterns to offending. For example, those offenders who selected stranger victims tended to be single ($r = .18$), select female victims ($r = -.11$) and have prior sexual (.14) and nonsexual (.13) offenses. Further elaboration of such patterns will be left to interested readers.

Table 3

Average intercorrelation of predictor variables

Variables	1.	2.	3.	4.	5.	6.	7.	8.
1. age								
2. single	.28	-						
3. prior sex offenses	-.10	.05	-					
4. prior nonsex offenses	-.04	.04	.15	-				
5. extrafamilial victims	.09	.32	.19	.13	-			
6. stranger victims	.09	.18	.14	.13	.49	-		
7. male victims	-.02	.16	.10	-.12	.09	-.11	-	
8. sex offense recidivism	.11	.12	.20	.06	.14	.10	.11	-

Note: Average sample size of 2,145. All correlations of .05 or greater are statistically significant.

When stepwise regression (n = 1,000; $p < .05$ in; $p > .10$ out) was used to predict sexual offense recidivism, four variables were retained: prior sex offenses (beta = .19), age less than 25 (beta = .12), any male victims (beta = .09), and any extrafamilial victims (beta = .09). The remaining variables (stranger victims, marital status, prior nonsexual offenses) did not significantly contribute to the prediction equation once the initial four variables were entered. The multiple correlation for the four variable equation was .27. When all seven variables were considered the multiple correlation only increased to .28.

Based on the results of the regression analysis, a brief actuarial risk scale was constructed by simply adding together the best four predictor variables (see Table 4). This scale was labeled the Rapid Risk Assessment for Sexual Offense Recidivism, or RRASOR. One point was assigned for each of the following characteristics: age less than 25, any extrafamilial victims, and any male victims. Consistent with the results of the regression analysis, additional weight was placed on the sexual offense history in comparison to the other variables. Consequently, the

subject could receive up to three additional points based on the number of prior sexual offenses. The scale could range from '0' (first time incest offenders over the age of 25) to '6' (extrafamilial boy-object pedophiles with four or more prior convictions who are released prior to the age of 25). Although a score of 6 was theoretically possible, there were no offenders observed in the highest risk category. Detailed scoring rules are presented in Appendix I.

The next stage of the analyses examined the predictive validity of the risk scale in each of the development and validation samples.

As can be seen in Table 5, the RRASOR showed a moderate level of predictive accuracy across all the samples. In the development samples, the correlations with sexual offense recidivism ranged from .19 to .30, with an average of .27. The variability in the correlations across studies was no more than would be expected by chance (χ^2 [5] = 3.88, p > .30). Similarly, the average area under the ROC curve indicated moderate predictive accuracy (.71) with no significant variability across the studies (χ^2 [5] = 7.75, p > .10). The predictive accuracy of the RRASOR in the independent validation sample (HM Prison) was not significantly different from that found in the development samples (r = .25; comparison Z = .24, p > .70; ROC area = .67; comparison Z = 1.04, p > .25). Consequently, the results from all the samples were combined to yield an average correlation of .27 (n = 2,592) and an average area under the ROC curve of .71 (SD = .015).

An important question is the extent to which the risk scale can be used to estimate overall recidivism rates for different risk categories. Such estimates are difficult to make since the recidivism rates depend on the follow-up period as well as local criminal justice practices (e.g., police vigilance, victims willingness to report). Nevertheless, a rough estimate of the estimate recidivism rates is provided in Table 6. The recidivism rates were first calculated by simply summing the findings across study (column 1). A limitation to this approach is that the follow-up periods varied across studies (range of 2.4 to 23 years, with an average of 9.3 years). Consequently, the next two columns of Table 6 present estimates of the recidivism rates assuming standard five and 10 year follow-up periods.

Table 4

The Rapid Risk Assessment for Sexual Offense Recidivism (RRASOR).

Prior sex offenses (not including index offenses)	
none	0
1 conviction; 1-2 charges	1
2-3 convictions; 3-5 charges	2
4 or more convictions; 6 or more charges	3
Age at release (current age)	
more than 25	0
less than 25	1
Victim gender	
only females	0
any males	1
Relationship to victim	
only related	0
any non-related	1

To standardize the rates across studies, certain assumptions concerning the recidivism rates were required. Based on previous long-term follow-up studies (e.g., Hanson et al., 1993; Rice & Harris, 1997), it was assumed that the recidivism rate was quickest during the first five years and then continued at a lower rate (approximately half) for up to 15 years post release. The amount of recidivism following 15 years post release was considered to be negligible. It was also assumed that the ratio of the recidivism rates for the different risk levels would be approximately constant across time (i.e., the "proportional hazard" assumption). Consequently, the adjustment was based on the following simple formula:

Total recidivism rate =
YRR*years(for years 1 - 5) + (½)YRR*years(for years 6 - 15),

where YRR is the estimated yearly recidivism rate for years 1 to 5. After estimating the average yearly recidivism rate in each study, the 5 and 10 year recidivism rates were then calculated for each level of the risk scale. The estimates from each sample were then averaged. This procedure increases the recidivism rates for studies with short follow-up periods, and decreases the rates for studies with long follow-up periods.

Table 5

Validity of the RRASOR for predicting sexual offense recidivism.

Sample	r	ROC area	sample size
Development samples			
Millbrook	.22	.64	99
Institut Philippe Pinel	.27	.73	340
Alberta Hospital Edmonton	.25	.77	355
SOTEP (California)	.30	.74	1091
Canadian Federal 1991/1994 Releases	.19	.68	241
Oak Ridge (Penetang)	.21	.62	153
Validation sample			
HM Prison Service (UK)	.25	.67	303
Total	.27	.71	2,592

As a check on the accuracy of this estimation procedure, the estimated rates were compared to the observed yearly recidivism rates in one of the long term data sets in which survival rates were available (Hanson et al., 1993). The estimates correlated .99 with the observed values (interclass correlation of .95, using equation ICC[A,1] from McGraw & Wong, 1996), lending support to the validity of the estimation procedure.

Table 6

Estimated recidivism rates for each risk scale score.

		Recidivism rate (%)		
			adjusted rates	
RRASOR Score	Sample Size	unadjusted	five year	10 year
0	527	5.3	4.4	6.5
1	806	8.8	7.6	11.2
2	742	16.2	14.2	21.1
3	326	26.7	24.8	36.9
4	139	36.7	32.7	48.6
5	52	53.8	49.8	73.1
total	2,592	14.9	13.2	19.5

Each increase in value of the risk scale was associated with an orderly increase in the sexual offense recidivism rate. The rates were less than 7% in the lowest category, and increased to over 50% in the highest risk categories. Most of the sexual offenders would be classified as moderate to low risk by this scale (80% of the sample would have an expected 5 year sexual offense recidivism rate less than 15%). The results also suggest that it is possible to identify a small subgroup of sexual offenders (2% - 8%) who are at substantial risk for sexual offense recidivism over the long-term.

Discussion

The sexual offense recidivism rates and the predictor variables identified in this study were very similar to those found in other recidivism studies. In the current study, the estimated five year sexual offense recidivism rate was 13.2% (n = 2,592), which was very close to the 13.4% estimate (n = 23,393) provided in Hanson and Bussière's (1996) meta-analysis. All official sexual offense recidivism rates should be considered underestimates, however, since many sexual offenses are never reported (Bonta & Hanson, 1994). As in other studies, prior

sexual offenses was a moderate recidivism predictor (r = .20); all of the other variables showed small, although statistically significant, correlations with recidivism (i.e., extrafamilial victims, stranger victims, being single, being young, male victims, and prior nonsexual offenses).

Not all of the predictor variables, however, contributed new information. When the variables were statistically combined to predict recidivism (stepwise regression), four variables accounted for unique variance: prior sexual offense, age (young), extrafamilial victims and boy victims. These variables are those that have repeatedly been identified as important for risk assessment of sexual offenders (Quinsey et al., 1995; Radzinowicz, 1957). Even though a variable did not contribute to the regression equation, it does not mean that it was unimportant. Stranger victims, for example, significantly contributed to the regression equation when extrafamilial victims was excluded; however, the high correlation between stranger victims and extrafamilial victims resulted in only one of these variables contributing unique variance.

A risk scale based on the four best predictor variables showed moderate predictive accuracy in both the development and replication samples. The predictive accuracy varied somewhat across samples, but the amount of inter-study variability was no more than would be expected by chance. Lack of statistically significant variability does not necessarily mean that there were no real differences across the samples (Schmidt, 1996): the scale may, indeed, work better in some settings than in others. Such variability would be expected due to differences in local criminal justice policies or to minor differences in the coding of the predictor and recidivism measures. However, the amount of observed variability was small and there were no obvious factors that could account for the between study differences (e.g., mental health versus correctional setting, length of follow-up, Canada versus USA).

On average, the brief risk scale (RRASOR) correlated .27 with sexual recidivism, which was significantly higher than the best single predictor (i.e., prior sexual offenses, r = .20). The level of predictive accuracy found in this study suggest that it is possible to identify a large group of relatively low risk offenders whose chances of recidivism are less than 15% over ten years, as well as identifying a small group of sexual offenders whose chances of long-term recidivism are greater than 50%. This level of predictive accuracy is as good or better than that found using more elaborate scales, such as the VRAG (Rice & Harris, 1997) or the Minnesota risk assessment scheme (Epperson et al., 1995). The unpublished HM Prison Service risk scale has been reported to have slightly better accuracy than the RRASOR in the sample of offenders from England and Wales (.33 versus .27; D. Thornton, personal communication, March 11, 1997), but the applicability of the HM Prison Service scale to other settings has yet to be examined.

The current study found little contribution of nonsexual criminal history to sexual offense recidivism. The zero-order correlation was only .06, and it did not contribute unique variance to the regression equation. The current findings contrast with Hanson and Bussière's (1996) previous findings that sexual offense recidivism was predicted by a number of variables related to general antisocial behaviour (antisocial personality, total prior offenses). The difference could be related to different coding procedures. In some previous studies, evidence of sexual deviance may have contributed to assessments of general criminality, which could have artificially inflated the relationship between general criminality and sexual offense recidivism. On the other hand, there may be aspects of general criminality that do contribute to sexual offense recidivism, but these aspects were not captured by the simple coding scheme used in this study (i.e., no prior

versus any prior nonsexual offenses). For example, it is possible that only those offenders with extensive nonsexual criminal histories are at increase risk for sexual offense recidivism. As well, increased risk may be related to the co-morbidity of sexual deviance and antisocial lifestyle/psychopathy (see Rice & Harris, 1997). Such hypotheses await further empirical study.

Another direction for future research is the extent to which the same factors apply to subgroups of sexual offenders. It may be that age, for example, is a more important risk factor for rapists than for child molesters. Similarly, male victims may be a more relevant risk factor for child molesters than for rapists. Nevertheless, the consistency of the results across the different samples suggest that many of the same factors apply to diverse groups of sexual offenders.

Implications for applied risk assessment

For most areas of human behaviour, actuarial predictions have worked as well or better than predictions based on unguided clinical judgement or expert opinion (Grove & Meehl, 1996). Predicting sexual offense recidivism is unlikely to be an exception. Hanson and Bussière (1996) found that the average accuracy of clinical assessments to predict sexual offender recidivism was an unimpressive $r = .10$ (ten different follow-up studies, $n = 1,453$). The brief risk scale introduced in this study is a clear improvement over the typical unguided clinical judgement, but its use in isolation is not recommended.

Sole reliance on actuarial risk scales can only be justified when the scale considers a sufficient number of relevant predictor variables. The RRASOR was not intended to provide a comprehensive assessment of all the factors relevant to the prediction of sexual offender recidivism. Instead, the RRASOR should be used only to screen offenders into relative risk levels. These risk levels could then be adjusted by the consideration of other relevant information, such as deviant sexual preferences and treatment compliance (Hanson & Bussière, in press).

Given the low accuracy of clinical assessments, prudent evaluators will be exceedingly cautious about diluting actuarial predictions with irrelevant information. Many of the "standard" clinical risk factors, such as denial or a history of child sexual abuse, have not been found to predict sexual offense recidivism (Hanson & Bussière, 1996). Even with the most well documented risk factors, the extent to which they contribute unique variance remains an important empirical question. There is, nevertheless, sufficient recidivism research to suggest that applied risk assessments should consider more than the four basic factors covered in the RRASOR.

The obvious weakness of the RRASOR is that it does not directly consider deviant sexual preferences. Deviant sexual preferences were among the strongest recidivism predictors in Hanson and Bussière's (1996) meta-analysis. For those offenders with a long history of sexual offending, specialized assessments of deviant sexual preferences are unlikely to provide much new information; however, it is possible that specialized sexual preference assessments may be informative for those without an established pattern of sexual crime.

Other areas not covered were the offenders' cooperation with treatment and community supervision. Offenders who failed to complete treatment are at higher recidivism risk than those who complete treatment (Hanson & Bussière, in press) and there is some evidence that those offenders who fail to cooperate with community supervision are also at increased risk (Hanson & Harris, 1997). Whether these factors contribute unique variance to risk assessments has yet to be determined.

Conclusion

The brief actuarial risk scale developed in this study predicted sexual offense recidivism with sufficient accuracy to justify its use as a screening measure. It is easily scored from administrative records and could have considerable utility in contexts that require routine assessments of sexual offender risk levels. Although its predictive accuracy was as good or better than other available measures, it does not provide a comprehensive evaluation and is not recommended to be used in isolation. As well, it is likely that the consideration of additional variables (such as measures of sexual deviancy) may lead to the development of even better actuarial risk assessment measures than the measure proposed in this study. Nevertheless, the current results suggests that sexual offense recidivism can be usefully predicted through the consideration of a limited number of uncomplicated variables.

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Appendix I

Coding rules for scoring the RRASOR

The following coding rules guided the development of the RRASOR. The scale is intended only for adult males who have already been convicted of at least one sexual offense. Its application to adolescents (less than 18 years) or female offenders is not recommended. The scale contains four items: prior sexual offenses, age at release, victim gender, and relationship to victim. The victim items should be coded based on all available information (official records, case notes, offender self-report, etc.). Prior sexual offenses, however, is based only on officially recorded arrests and convictions.

Prior sexual offenses. This item is based on officially recorded arrests and convictions for sexual offenses. Only arrests/convictions prior to the index offense are included. The basic concept is whether the offender has already been detected and/or sanctioned for sexual offense and then continued to offend. The index offense or offenses are not counted, even when there are multiple offenses and/or victims involved, and the offenses occurred over a long period of time. However, if, after being convicted with the index offense, an offender is arrested/convicted of historical offenses committed prior to the index offense, these offenses are counted.

Sexual offenses include all explicitly sexual offenses, such as sexual assault, incest, and prostitution related offenses, as well as non-sexual arrest/convictions that were based on sexual misbehaviour, such as Contributing to Juvenile Delinquency (child molesting), Trespass by Night (voyeurism), and Common Assault (plead down from sexual assault).

Arrests and convictions are recorded separately. A conviction counts as one arrest if there is no explicit mention of multiple charges leading to that conviction. In the cases of a plea bargain, where the conviction is different from the arrest (e.g., assault versus sexual assault), both the charge and the conviction are considered sexual. For both arrest and convictions, the number of different counts are coded (e.g., conviction for three counts of sexual assault at one hearing would be coded as three prior convictions).

The RRASOR score is based on the either the number of charges or the number of convictions, depending on which indicates the highest risk level. The categories are as follows:

Score	Prior convictions	Prior charges
0	0	0
1	1	1 or 2
2	2 or 3	3, 4 or 5
3	4 or more	6 or more

The following example illustrates the coding rules.

Offense History			Coding	
Date	Charges	Convictions	Convictions	Charges
1982	Sexual Assault Indecent Act	Common Assault	1	2
1984	Robbery	(withdrawn)		
1987	Gross Indecency	Gross Indecency	1	4
	Buggery (3 counts)	(acquitted)		
1990		Theft over $1000		
1992		Invitation to sexual touching (index offense)	<not counted>	

This offender had a total of 2 prior sexual convictions (2 points on RRASOR) and 6 prior charges (3 points on RRASOR). Consequently, the offender would receiver a score of '3' on this item, the highest of the two scores.

Age at Release (current age). The RRASOR is based on the offender's age at the time period targeted by the risk assessment. If the assessment concerns the offender's current risk level, it would be his current age. If the assessment concerns an anticipated exposure to risk (e.g., release, reduced security at some future date), the relevant age would be his age when exposed to risk. Offenders who are between their 18th and 25th birthday receive one point, whereas those 25 years old or older receive a score of zero. The RRASOR is not intended for those who are less than 18 years old at time of exposure to risk.

Age	RRASOR score
18 - 24.99	1
25 +	0

Victim gender. If the offender has ever committed a sexual offense against a male victim, then the offender receives one point on the RRASOR. Sexual offenders who exclusively target female victims receive a score of zero. Nonsexual offenses against male victims do not count, unless, of course, a nonsexual charge/conviction was for acts of sexual misbehaviour. To judge whether the offender has ever targeted male victims for sexual offenses, all available information is used, including offender self-reports, official records, collateral sources and case notes.

Victim gender	RRASOR score
Any male victims	1
Only female victims	0

Relationship to victim. Offenders who selected any unrelated victims receive one point on the RRASOR. Related victims include spouses (legally married and common-law) and those family members who are too closely related to be married (e.g., biological and step-children, parents, grandchildren, in-laws, nieces, nephews). As well, if the offender is in a parental role to a victim living in the same household, they are considered to be related. However, offenders who move into a household simply to obtain victim access should be considered extrafamilial. In general, offenders who remain in a household for more than two years before initiating sexual abuse should be intrafamilial.

All available information is used to identify whether the victims were related or unrelated.

Relationship to victim	RRASOR score
Any unrelated victims	1
Only related victims	0

RRASOR Total Score. The RRASOR total score is simply the sum of the individual items. These scores can range from zero to six.

Appendix E

STATIC-99: Improving Actuarial Risk Assessments for Sex Offenders

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Static 99: Improving Actuarial Risk Assessments for Sex Offenders

1999-02

AUTHOR NOTE

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Abstract

The study compared the predictive accuracy of three sex offender risk assessment measures: the RRASOR (Hanson, 1997), Thornton's SACJ-Min (Grubin, 1998), and a new scale, Static-99, created by combining the items from the RRASOR and SACJ-Min. Predictive accuracy was tested using four diverse data sets drawn from Canada and the UK (total n = 1,301). The RRASOR and the SACJ-Min showed roughly equivalent predictive accuracy and the combination of the two scales was more accurate than either original scale. Static-99 showed moderate predictive accuracy for both sexual recidivism (r = .33, ROC area = .71) and violent (including sexual) recidivism (r = .32, ROC area = .69). The variation in the predictive accuracy of Static-99 across the four samples was no more than would be expected by chance.

STATIC 99: IMPROVING ACTUARIAL RISK ASSESSMENTS FOR SEX OFFENDERS

The management of sex offenders within the criminal justice system can be substantially influenced by the offender's perceived risk for recidivism. Those sex offenders deemed high risk may be subject to substantial restrictions, such as post-sentence detention, indeterminate sentences, and long-term community supervision. Conversely, sex offenders deemed to be low risk may be placed on probation and, if incarcerated, be considered for early release.

Although many decisions require risk assessments, the procedures used for making such assessments often have limited validity. In general, the average predictive accuracy of professional judgement to predict sex offence recidivism is only slightly better than chance (average r = .10, Hanson & Bussière, 1998). Some have even argued that the accuracy of prediction is sufficiently low that it threatens the very basis of risk-based legal sanctions for sex offenders (Janus & Meehl, 1997).

Recent research, however, has the potential of substantially improving the accuracy of recidivism risk assessments for sex offenders. Hanson and Bussière's (1998) meta-analytic review identified a number of risk factors that were reliably associated with sex offence recidivism. Most of these factors were static, historical variables related to sexual deviance (e.g., prior sex offences, stranger victims) and general criminality (e.g., prior non-sex offences, antisocial personality disorder). Several different actuarial risk instruments have also been developed to predict recidivism among sexual offenders (e.g., Sex Offender Risk Appraisal Guide [SORAG], Quinsey, Harris, Rice & Cormier, 1998; Minnesota Sex Offender Screening Tool – Revised [MnSOST-R], Epperson, Kaul & Hesselton, 1998); Rapid Risk Assessment for Sex Offence Recidivism [RRASOR], Hanson, 1997; Thornton's Structured Anchored Clinical Judgement [SACJ], Grubin, 1998). These actuarial scales not only specify the items to consider, but also provide explicit direction as to the relative importance of each item. The items in the scales are similar, although the scales vary as to the relative weight accorded to the general factors of sexual deviance versus antisociality.

The SORAG (Quinsey et al., 1998) is a variation of the Violence Risk Appraisal Guide (VRAG; Quinsey et al., 1998) for sexual offenders. Like the VRAG, the SORAG was designed to assess any violent recidivism, not just sexual recidivism. It contains 15 items addressing early childhood behaviour problems, alcohol problems, sexual and nonsexual criminal history, age, marital status, and personality disorders (with a large weight on psychopathy). The MnSOST-R was developed to predict sexual recidivism among rapists and extrafamilial child molesters. The MnSOST-R includes 16 items addressing sexual and non-sexual criminal history, the victims' age and relationship to the offender, substance abuse, unstable employment, age, and treatment history (Epperson et al., 1998). Both the RRASOR (Hanson, 1997) and SACJ (Grubin, 1998) were intended to be relatively brief screening instruments for predicting sexual offence recidivism.

The purpose of the present study was to compare the predictive accuracy of two of these actuarial schemes: the RRASOR (Hanson, 1997) and the SACJ (see Grubin, 1998). Although rarely used in North American, the SACJ is routinely used in Her Majesty's Prison Service (England and Wales) and in many police departments in the UK. The SACJ contains items

related to sexual deviance, but also places considerable weight on non-sexual criminal history. The RRASOR, in contrast, almost exclusively targets factors related to sexual deviance. The RRASOR is widely used in Canada and the U.S., being the most common risk assessment tool used in post-sentence detention procedures (Doren, 1999). Given the different emphasis of the RRASOR and SACJ, one goal of the current study was to examined whether a simple combination of these two scales could improve upon the predictive accuracy of either original scale.

Rapid Risk Assessment for Sex Offence Recidivism (RRASOR; Hanson, 1997)

The aim of the RRASOR was to predict sex offence recidivism using a small number of easily scored variables. The initial pool of seven items were those that correlated at least .11 with sex offence recidivism in Hanson and Bussière's (1998) meta-analysis and were commonly recorded: prior sex offences, any prior non-sex offences, any male victims, any stranger victims, any unrelated victims, never married, and age less than 25 years. In order to identify the most efficient combination of these items, the correlations between these predictor variables were calculated in seven different data sets (total sample of 2,592), and then averaged using standard meta-analytic techniques (Hedges & Olkin, 1985). Following a suggestion by Becker (1996), the averaged correlation matrix was then subjected to step-wise regression to identify the best predictor variables.

Of the original seven variables, four substantially contributed to the regression equation (beta greater than .09): prior sex offences, any unrelated victims, any male victims and age less than 25 (see Table I). The scale resulting from the simple combination of these four variables was then tested on an entirely new sample (HM Prison). Overall, the scale showed comparable predictive accuracy in both the development and validation samples (average r = .27; average ROC area = .71).

Structured Anchored Clinical Judgement (SACJ; Grubin, 1998).

The SACJ aims to predict sexual and violent recidivism using a stage approach, with each stage incorporating different types of information. The first stage considers the offender's official convictions: specifically, any current sex offences, any prior sex offences, any current non-sexual violent offences, any prior non-sexual violent offences, and four or more prior sentencing occasions (see Table 1). If offenders have four or more of the initial factors, they are automatically considered high risk. If two or three factors are present, offenders are considered medium risk, and zero or one factors indicate low initial risk.

Table 1

Items in the RRASOR, SACJ-Min, and Static-99

Type of risk factor	RRASOR	SACJ-Min	Static-99
Sexual deviance	male victims	male victims	male victims
		never married	never married
		non-contact sex offences	non-contact sex offences
Range of potential victims	unrelated victims		unrelated victims
		stranger victims	stranger victims
Persistence	prior sex offences (3 points)		prior sex offences (3 points)
		current sex offence	
		prior sex offence	
Antisociality		current non-sexual violence	current non-sexual violence
		prior non-sexual violence	prior non-sexual violence
		4+ sentencing dates	4+ sentencing dates
Age	18 - 24.99 years		18 - 24.99 years

The second step considers a number of potentially aggravating factors, such as lack of prior relationship to victim. If two or more of these factors are present, then the offenders' initial risk level is increased one category. The eight potentially aggravating factors are divided into two sets. Set A includes any stranger victims, any male victims, never married, and convictions for non-contact sex offences (e.g., exhibitionism, obscene phone calls). Set B includes items that are somewhat more difficult to assess such as substance abuse, placement in residential care as a child, deviant sexual arousal, and psychopathy. The SACJ was designed to be used even when there is missing data. The Step 1 and Step 2 - Set A items are considered the minimum required for a valid assessment, and using these items results in a reduced scale called SACJ-Min.

The final step of the SACJ (Step 3) considers information that is unlikely to be obtained except for sex offenders who enter treatment programs (e.g., treatment drop-out, improvement on dynamic risk factors). Since only the SACJ-Min has been subject to cross-validation, the final step of the SACJ will not be considered further in this report.

The SACJ was developed through exploratory analyses on several UK data sets. The SACJ-Min was then validated on an entirely new sample of approximately 500 sex offenders released from Her Majesty's Prison Service in 1979 (16 year follow-up on the complete cohort). This HM Prison sample included the 303 offenders originally used to validate the RRASOR. In the validation sample, the SACJ-Min correlated .34 with sex offence recidivism and .30 with any sexual or violent recidivism (Thornton, Personal communication, February 10, 1999). The SACJ-Min has yet to be tested on samples from outside the UK.

Static-99

Preliminary analyses suggested that RRASOR and the SACJ-Min were assessing related, but not identical constructs. Both scales contributed unique variance to regression equations when their total scores were used to predict sexual recidivism. Consequently, it was possible that a combination of the two scales may predict better than either original scale. A new scale was created by adding together the items from the RRASOR and SACJ-Min. The scale is called Static-99 to indicate that it includes only static factors and that the current version is this year's version of a work in progress. The complete list of items is listed in Table 1 and the scoring criteria are given in Appendix I.

Importance of replication

It is important that risk scales developed on one sample be tested on at least one independent sample. Without replication, the relationships found in the development sample may be related to idiosyncratic features of that sample. Evaluators applying a risk scale to new settings would have increased confidence if the scale had already been demonstrated to show adequate predictive accuracy in a variety of settings.

Replications, however, are more often advocated than conducted. The observed sex offence recidivism base rate is sufficiently low that many years are required before new studies yield meaningful results. Researchers eager for new results have the option of using existing data bases, but data bases created for one purpose may poorly fit other needs. Apart from the obvious problem of missing variables, different data sets often have subtle variations in the definitions of the variables. For example, recidivism may be defined by charges versus

convictions, or the relationship to victims may be based on officially recorded offences versus for all known offences.

When a risk scale shows significant variability across samples, the differences may be due to variation in scoring procedures, or the scale may have differential validity in different samples. On the other hand, if similar results are found across samples (despite minor differences in coding rules), then a scale would appear robust.

METHOD

Samples

The first three samples were, with minor modifications, the same samples used in the development of the RRASOR (see Table 2). The results reported below are not identical to those reported in Hanson (1997) due to minor recoding of some variables (correcting coding errors, replacing missing data). The fourth sample (HM prison) was not used in the development of either the RRASOR or SACJ, but a subsample of the HM Prison offenders were used as the validation sample for both these risk scales. The HM Prison sample has the important feature of being an unbiased cohort of all the sex offenders released in the target year (1979). In contrast, the other samples primarily comprised sex offenders referred to assessment and/or treatment at particular institutions.

Institut Philippe Pinel (Montreal). (Proulx, Pellerin, McKibben, Aubut & Ouimet, 1995; see also Proulx, Pellerin, McKibben, Aubut & Ouimet, 1997; Pellerin et al., 1996). This study focused on sexual offenders treated at a maximum security psychiatric facility between 1978 and 1993. The Institut Philippe Pinel provides long term (1-3 years) treatment for sexual offenders referred from both the mental health and correctional systems. Information concerning predictor variables was drawn from their clinical files and recidivism information from RCMP records collected in 1994.

Information was available on all the predictor variables except stranger victims and non-contact sexual offences. As well, it was impossible to separate index and prior non-sexual violence since only the total number of charges for non-sexual violence were recorded. Similarly, the variable marking the total number of sex offence charges included index offences. To estimate the number of prior sex offence convictions, the number of victims for the index offence was subtracted from the total number of charges.

Millbrook Recidivism Study (Hanson, Steffy & Gauthier, 1993b; see also Hanson, Scott & Steffy, 1995; Hanson, Steffy & Gauthier, 1992; Hanson, Steffy & Gauthier, 1993a). This study collected long-term recidivism information (15-30 years) for child molesters released between 1958 and 1974 from Millbrook Correctional Centre, a maximum security provincial correctional facility located in Ontario, Canada. About half of the sample went through a brief treatment program. For the treatment sample, the information concerning the predictors was collected from their clinical files, whereas for the remainder of the sample, the information was extracted from their correctional files. Recidivism information was coded from national records maintained by the Royal Canadian Mounted Police (RCMP).

Information was available on all the relevant predictor variables, except for convictions for non-contact sex offences (missing for all cases). Information concerning stranger victims was available for the treatment sample only (n = 99). As well, the total number of prior convictions was used instead of the total number of prior sentencing dates.

Oak Ridge Division of the Penetanguishene Mental Health Centre. (Rice & Harris, 1996; see also Quinsey, Rice & Harris, 1995; Rice & Harris, 1997; Rice, Harris & Quinsey, 1990; Rice, Quinsey & Harris, 1991). The Oak Ridge study followed sexual offenders referred between

1972 and 1993 for treatment and/or assessment to a maximum security mental health centre located in Ontario, Canada. The majority of the referrals came from the mental health systems or the courts (e.g., pretrial fitness examinations), with a minority of cases coming from provincial or federal corrections. Follow-up information was based on RCMP records as well as mental health records (i.e., new admissions for sexual offenses, whether or not new charges were laid).

Information was available for all the predictor variables with the following exceptions. Convictions for non-contact sex offence was not available for all cases. Relationship to victim was only available for the most serious offence. The data set counted any male child victims rather than any male victims. The number of prior convictions was used instead of the number of prior sentencing dates. Finally, only the most serious index offence was recorded in the data set. Consequently, index convictions for non-sexual violence that was considered less serious than the index sex offence would not have been recorded.

Her Majesty's Prison Service (UK). (Thornton, 1997). The study provided a 16 year follow-up of 563 sexual offenders released from Her Majesty's Prison Service (England and Wales) in 1979. Recidivism information was based on Home Office records collected in 1995. Very few of the offenders in this sample would have received specialised sexual offender treatment.

Information was available for all the relevant predictor variables. Previous sex offences, however, was coded based on the offenders' previous sentencing occasions rather than the number of convictions or charges.

Table 2

SAMPLE				
	Institut Philippe Pinel	**Millbrook**	**Oak Ridge**	**HM Prison England and Wales**
Setting	secure psychiatric	provincial prison	secure psychiatric	all prisoners released in 1979
Minimum Sample Size	344	191	142	531
Age at Release (SD)	36.2 (10.9)	33.1 (9.9)	30.4 (9.5)	34.4 (12.7)
% Child Molesters	70.4	100.0	49.3	60.7
Prior Offences				
Sexual (%)	50.5	41.9	31.8	34.0
Any (%)	58.1	72.0	67.7	74.9
Average Years of Follow-up	4	23	10	16
Recidivism Criteria	convictions	Convictions	charges/ readmissions	convictions
Recidivism rates				
Sexual Only (%)	15.4	35.1	35.1	25.0
Any violent (%)	21.5	44.0	57.6	37.4

ANALYSIS

Measure of predictive accuracy

The area under the Receiver Operating Characteristic (ROC) curve was used as the primary measure of predictive accuracy (Hanley & McNeil, 1982; Mossman, 1994; Rice & Harris, 1995). The ROC curve plots the hits (accurately identified recidivists) and false alarms at each level of the risk scale. The area under the ROC curve can range from .50 to 1.0, with 1.0 indicating perfect prediction (no overlap between recidivists and non-recidivists) and .50 indicating prediction no better than chance. In general, the ROC area can be interpreted as the probability that a randomly selected recidivist would have a more deviant score than a randomly selected nonrecidivist. The ROC area has advantages over other commonly-used measures of predictive accuracy (e.g., percent agreement, correlation coefficients, RIOC) since it is not constrained by base rates or selection ratios (see Swets, 1986).

The correlation coefficient, r, is also presented to facilitate comparison with the results of other studies. For example, the average correlation between prior sex offences and sex offence recidivism is .19 (95% confidence interval .17 to .21; Hanson & Bussière, 1998). To have utility in predicting long-term recidivism, risk scales need to improve upon this minimum standard.

Comparing results

Standard meta-analytic procedures were used to compare results across studies (Hedges & Olkin, 1985; Hedges, 1994; McClish, 1992). Variability across studies was indexed by the Q statistic: $Q = \sum w_i (A_i - A.)^2$, where A_i is the ROC area for each sample, w_i is the weight for each sample (inverse of its variance – SE^2), and A. is the weighted grand mean ($\sum w_i A_i / \sum w_i$). The Q statistic is distributed as χ^2 with degrees of freedom equal to k - 1, where k is the number of groups. The predictive accuracy of the risk scales were compared using the test of correlated ROC areas described by Hanley and McNeil (1983): $Z = (A_1 - A_2)/(SE_1^2 + SE_2^2 - 2rSE_1SE_2)^{1/2}$. The ROC statistics were computed using ROCKIT Version 0.9.1 (Metz, 1998).

Estimating recidivism rates

Applied risk assessments are often concerned about whether offenders have a specific probability of recidivism (e.g., greater than 50%). Since recidivism rates are highly influenced by the length of the follow-up period, recidivism probabilities were estimated using survival analysis (Allison, 1984; Soothill & Gibbens, 1978). Survival analysis calculates the probability of recidivating for each time period given that the offender has not yet reoffended. Once offenders recidivate, they are removed from the analysis of subsequent time periods. Survival analysis has the advantage of being able to estimate year by year recidivism rates even when the follow-up periods vary across offenders. Readers should be aware, however, that the estimates for the longest follow-up periods can be unstable if there are few offenders remaining in the later years.

RESULTS

As can be seen in Table 3, the predictive accuracy of the scales was relatively consistent across the samples. For both the RRASOR and Static-99, the amount of variability was no greater than would be expected by chance (all $p > .30$). The SACJ-Min, however, showed significant variability in the prediction of sexual recidivism ($Q = 7.89$, $df = 3$, $p < .05$). The SACJ-Min predicted sex offence recidivism best in HM Prison sample ($A = .74$) and worst in the Millbrook sample ($A = .61$).

Table 3

Predictive accuracy of RRASOR, SACJ-Min, and Static-99 across samples (ROC areas)

	Pinel	Millbrook	Oak Ridge	HM Prison 1979	Average		
					A.	Q	Sample Size
Sexual Recidivism							
RRASOR	.71	.66	.62	.71	.68	3.56	1,225
SACJ-Min	.66	.61	.63	.74	.69	7.89*	1,301
Static-99	.73	.65	.67	.72	.70	3.42	1,228
Any Violent Recidivism							
RRASOR	.65	.67	.60	.65	.65	1.17	1,228
SACJ-Min	.65	.65	.67	.69	.67	2.24	1,304
Static-99	.71	.71	.69	.69	.69	1.52	1,231

*$p < .05$.

The samples were combined to directly test the relative predictive accuracy of the RRASOR, SACJ-Min and Static-99 (see Table 4). Only subjects who had complete data on all three risk scales were used in the combined sample (total n = 1,208). The average values of the scales in the combined samples were as follows: RRASOR mean = 1.77, SD = 1.29; SACJ-Min, mean = 2.02, SD = .76; Static-99 mean = 3.15, SD = 1.97. The comparison of predictive accuracy of the scales used the test for correlated ROC areas described by Hanley and McNeil (1983).

Table 4

Relative predictive accuracy of the RRASOR, SACJ-Min and Static-99.

	Combined Sample (n = 1,208)				Rapists (n = 363)	Child molesters (n = 799)
	ROC Area	95% C.I.	r	95% C.I.	ROC area	ROC area
Sexual recidivism						
RRASOR	.68	.65-.72	.28	.23-.33	.68	.69
SACJ-Min	.67	.63-.71	.23	.18-.28	.69	.68
Static-99	.71	.68-.74	.33	.28-.38	.71	.72
Any violent Recidivism						
RRASOR	.64	.60-.67	.22	.16-.27	.64	.66
SACJ-Min	.64	.61-.68	.22	.16-.27	.62	.66
Static-99	.69	.66-.72	.32	.27-.37	.69	.71

For the prediction of sex offence recidivism, Static-99 (A = .71) was more accurate than the RRASOR (A = .68, Z = 2.38, p < .05) or the SACJ-Min (A = .67, Z = 2.84, p < .01). The RRASOR and SACJ-Min predicted sex offence recidivism with similar levels of accuracy (Z = .72, p > .40). For the prediction of any violent recidivism (including sexual), Static-99 (A = .69) was more accurate than either the RRASOR (A = .64, Z = 5.37, p < .001) or SACJ-Min (A = .64, Z = 3.84, p < .001). The RRASOR and SACJ-Min did not differ in the accuracy with which they predicted violent recidivism (Z = .35, p > .70).

In order to test the generalisability of the scales across subgroups of sex offenders, the offenders was divided into those who victimised adult females (rapists, n = 363) and those who victimised children (child molesters, n = 799). The comparison of predictive accuracy across these groups used the test of uncorrelated ROC areas described by McClish (1992). All the scales showed similar predictive accuracy for both rapists and child molesters (all Z < 1, all p > .30).

As can be seen from Figure 1 and Figure 2, the recidivism rates were very similar in the Pinel, HM Prison and Millbrook samples (for sexual recidivism, Survival $\chi^2 = 1.62$, df = 2, p > .40; for violent recidivism, Survival $\chi^2 = .65$, df = 2, p > .70). Survival dates were not available for the Oak Ridge sample. Given the similarity in the samples, the three data sets (Pinel, HM Prison, Millbrook) were combined for the purpose of creating estimated recidivism rates.

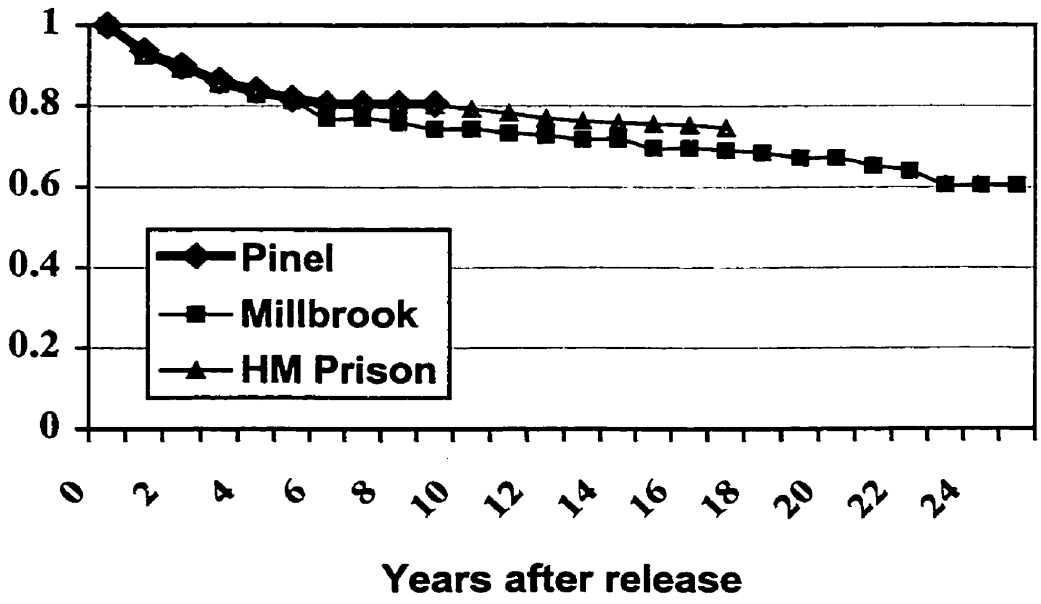

Figure 1. Sex offence recidivism rates (survival curves) for offenders released from three institutions.

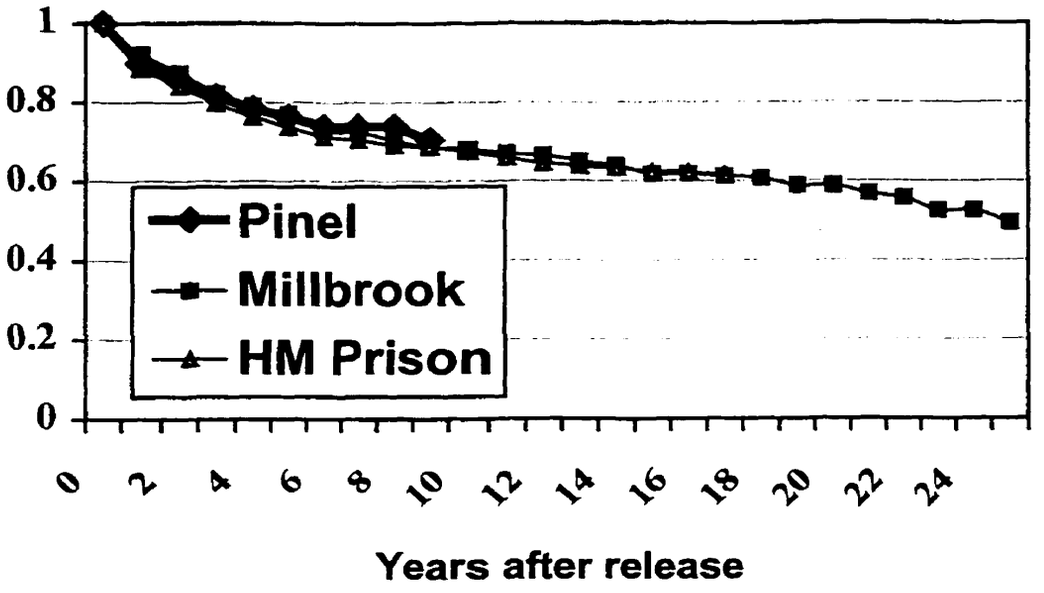

Figure 2. Violent recidivism rates (survival curves) for offenders released from three institutions.

The relationship between Static-99 scores and sexual recidivism is presented in Figure 3. The Static-99 scores were categorised as Low (0, 1; n = 257), medium-low (2, 3; n = 410), medium-high (4, 5; n = 290) and high (6 plus; n = 129). To minimise the influence of isolated, late recidivism events, the survival curves ended when there were fewer than 15 offenders exposes to risk for a particular year. The observed 5, 10 and 15 year recidivism rates are presented in Table 5. The rates up to 15 years should be reasonably reliable since all the offenders in the HM Prison and Millbrook samples were followed for at least 15 years.

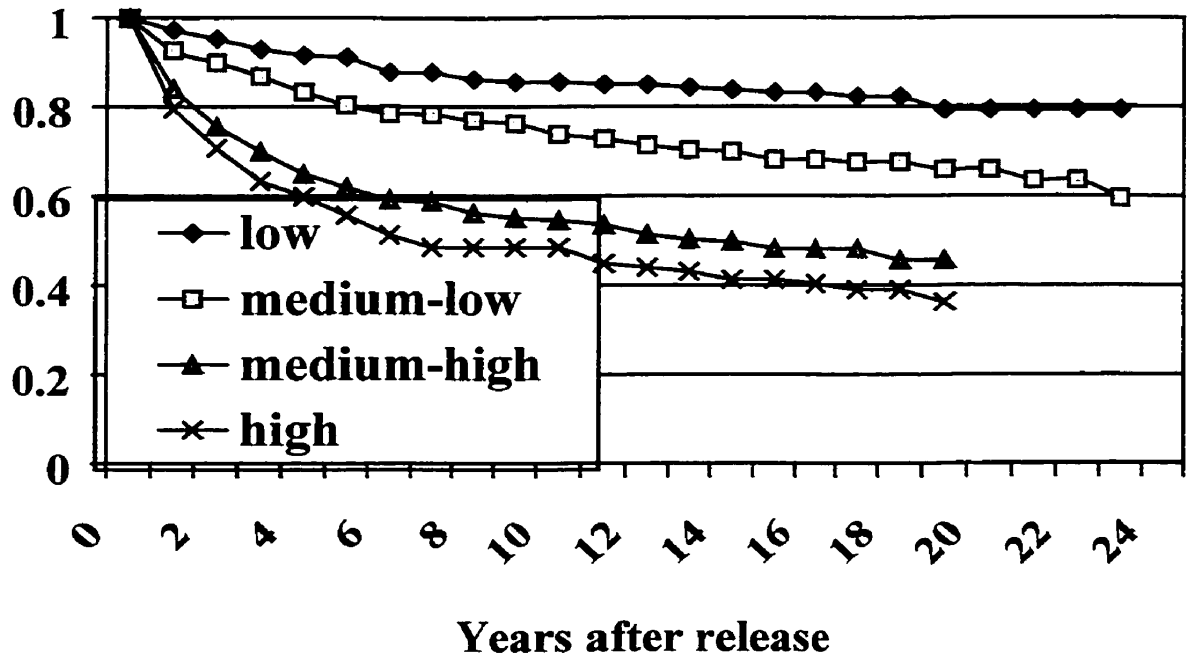

Figure 3. The relationship of Static-99 scores to sexual recidivism.

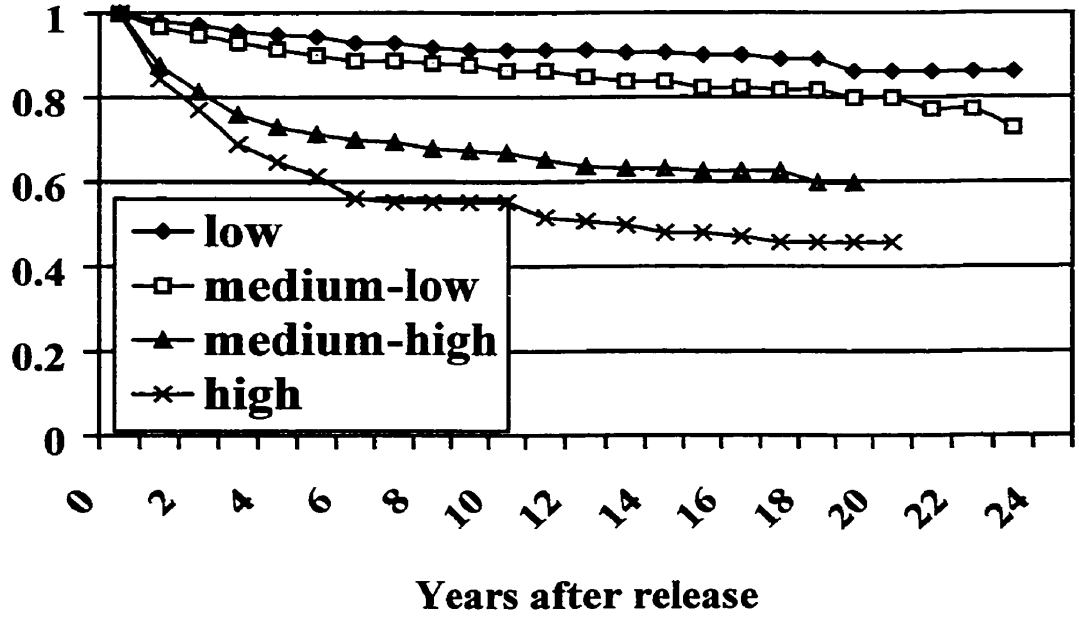

Figure 4. The relationship of Static-99 socres to violent recidivism.

Table 5

Recidivism rates for Static-99 risk levels.

Static-99 score	Sample size	Sexual recidivism			Violent recidivism		
		5 years	10 years	15 years	5 years	10 years	15 years
0	107 (10%)	.05	.11	.13	.06	.12	.15
1	150 (14%)	.06	.07	.07	.11	.17	.18
2	204 (19%)	.09	.13	.16	.17	.25	.30
3	206 (19%)	.12	.14	.19	.22	.27	.34
4	190 (18%)	.26	.31	.36	.36	.44	.52
5	100 (9%)	.33	.38	.40	.42	.48	.52
6 +	129 (12%)	.39	.45	.52	.44	.51	.59
Average 3.2	1086 (100%)	.18	.22	.26	.25	.32	.37

Static-99 identified a substantial subsample (approximately 12%) of offenders whose long-term risk for sexual recidivism was greater than 50%. The recidivism rates for the minimum entrant into the high risk category (score of '6') was 37%, 44% and 51% after 5, 10 and 15 years post release. Most of the offenders, however, were in the lower risk categories, with long-term recidivism risk of 10% to 20%.

As can be seen in Figure 4, offenders with high scores on Static-99 were also at substantial risk for any violent recidivism (approximately 60% violent recidivism rate over 15 years). The violent recidivism rate (including sexual) for the minimum entrant into the high risk category (score of '6') was 46%, 53% and 60% over 5, 10, 15 years, respectively. The violent recidivism rate of Static-99's Low risk category (0, 1) was 17% after 15 years.

DISCUSSION

The study compared the predictive accuracy of three sex offender risk assessment measures (the RRASOR, the SACJ-Min, and a combined scale, Static-99) across four data sets. The RRASOR and the SACJ-Min showed roughly equivalent predictive accuracy and the combination of the two scales was more accurate than either original scale. The incremental improvement of Static-99, however, was relatively small. Static-99 showed moderate predictive accuracy for both sexual recidivism (r = .33, ROC area = .71) and violent (including sexual) recidivism (r = .32, ROC area = .69). The variation in the predictive accuracy of Static-99 across the four samples was no more than would be expected by chance.

If a risk scale is to be used in applied contexts, then it is important to considered whether the degree of predictive accuracy is sufficient to inform rather than mislead. Critics could suggest, for example, that a correlation in the .30 range is insufficient for decision-making since it only accounts for 10% of the variance. Even if such an argument was correct (and many argue that it is not – see Ozer, 1985), most decision-makers are not particularly concerned about "percent of variance accounted for". Instead, applied risk decisions typically hinge on whether offenders surpass a specified probability of recidivism (e.g., more than 50%).

Estimating absolute recidivism rates is a difficult task since many sex offences go undetected (e.g., Bonta & Hanson, 1994). Observed recidivism rates (especially with short follow-up periods) are likely to substantially underestimate the actual recidivism rates. Nevertheless, Static-99 identified a substantial subsample of offenders (approximately 12%) whose observed sex offence recidivism rate was greater than 50%. At the other end, the scale identified another subsample whose observed recidivism rates was only 10% after 15 years. Differences of this magnitude should be of interest to many applied decision-makers.

The similarity in the observed recidivism rates across the samples allows some confidence in conviction rate estimates provided by Static-99. The degree of similarity was remarkable considering that the studies were drawn from different countries, different language groups, different settings (i.e., prison, secure hospital), and different decades. All the studies for which survival data was available used official conviction as the outcome criteria. On the other hand, the Oak Ridge sample had a higher recidivism rate than the other three samples. Thirty-five percent of the Oak Ridge sample recidivated with a sex offence recidivism rate within 10 years, whereas only 25% of the HM Prison Service recidivated after a longer follow-up period (16 years). The Oak Ridge recidivism rates were relatively high since they used a broad recidivism criteria (arrests, re-admissions) and they may have included particularly high risk offenders. In support of the later hypothesis, Scheffé's post hoc tests found that the mean score on Static-99 was higher in the Oak Ridge sample (mean = 4.1) than in the other three samples (mean = 3.0). Whether recidivism rate differences would remain after controlling for pre-existing risk levels could not be determined with the available data.

Another approach to judging a measure's predictive accuracy is to compare it to the available alternatives. For the prediction of sex offense recidivism, Static-99 is clearly more accurate (r = .33) than unstructured clinical judgement (average r = .10; Hanson & Bussière, 1998). The Violence Risk Appraisal Guide (VRAG), one of best established risk assessment

instruments, correlated only .20 with sex offence recidivism in a cross-replication (Rice & Harris, 1997). Quinsey et al. (1998) have proposed a revision of the VRAG for sexual offenders, entitled the Sex Offender Risk Appraisal Guide (SORAG). Although the SORAG is reported to be a good predictor of violent recidivism, its relationship to sexual recidivism is relatively weak (ROC area of .62 compared to .67 for Static-99 in the same Oak Ridge data set). The MnSOST-R appears to predict sex offence recidivism (r = .45) somewhat better than Static-99, but the MnSOST has yet to be fully cross-validated (Epperson et al., 1998).

Although Static-99 was designed to predict sex offence recidivism, it also showed reasonable accuracy in the prediction of any violent recidivism among sex offenders (r = .32, ROC area = .69). In comparison, a recent meta-analysis found the average correlation between Hare's Psychopathy Checklist-Revised (Hare, 1991) and violent recidivism was .27 (n = 1,374; Hemphill, Hare & Wong, 1998). Static-99, however, may not be the instrument of choice when the goal is predicting any violent recidivism. The VRAG, for one, predicts any violent recidivism substantially better than the Static-99 (r = .47, ROC area = .77, in a cross-replication sample of 159 sex offenders, Rice & Harris, 1997). Nevertheless, Static-99 may be useful in settings that lack the time, resources and/or information required to complete the VRAG.

The combination of the RRASOR and SACJ-Min was called Static-99 to indicate that it includes only static variables, and that it is this year's version of a work in progress. It is likely that actuarial risk scales can improve upon Static-99 by including dynamic (changeable) risk factors as well as additional static variables. The variables in Table 1 are grouped according to five dimensions that are plausibly related to the risk of sexual offence recidivism: sexual deviance, range of available victims, persistence (lack of deterrence or "habit strength"), antisociality, and age (young). The variables chosen to mark these dimensions were those conveniently available in the existing data sets. Deliberate efforts to create variables targeting these risk dimensions has the promise of substantially improving the prediction of sex offence recidivism. Additional variables could include, for example, repetitive victim choice (same age and sex) as a marker for sexual deviance (see Freund & Watson, 1991) or early onset of sex offending as a marker of "persistence".

The inclusion of dynamic factors would likely increase the scale's predictive accuracy (Hanson & Harris, 1998, in press). Among non-sexual criminals, dynamic variables predict recidivism as well or better than static variables (Gendreau, Little & Goggin, 1996). The research on dynamic factors related to sexual offending is not well developed, but some plausible dynamic risk factors include intimacy deficits (Saidman, Marshall, Hudson & Robertson, 1994), sexualisation of negative affect (Cortoni, 1998), attitudes tolerant of sexual assault (Hanson & Harris, 1998), emotional identification with children (Wilson, 1999), treatment failure, and non-cooperation with supervision (Hanson & Harris, 1998).

Use of Static-99 in sex offender risk assessments.

The Static-99 is intended to be a measure of long-term risk potential. Given its lack of dynamic factors, it cannot be used to select treatment targets, measure change, evaluated whether offenders have benefited from treatment, or predict when (or under what circumstances) sex offenders are likely to recidivate.

There are several different ways in which empirically derived risk scales can be used in clinical assessments. Quinsey et al. (1998) have argued for a pure actuarial approach: risk predictions are those provided by the actuarial scale with no allowances for other factors. They argue that clinical judgement is so much inferior to actuarial methods that any consideration of clinical judgement simply dilutes predictive accuracy.

Their position is plausible and is likely true in many situations. However, actuarial risk scales are accurate to the extent that they consider all relevant risk factors. Static-99 does not claim to be comprehensive, for it neglects whole categories of potentially relevant variables (e.g., dynamic factors). As well, prudent evaluators would want to consider whether there are special features of individual cases that limit the applicability of actuarial risk scales (e.g., a debilitating disease or stated intentions to reoffend).

As research progresses, variables external to the actuarial scheme will either be shown to improve risk predictions (and be incorporated into scales) or be shown to add no new information and be dismissed. Until the desired empirical information is available, evaluators wishing to consider external variables need to carefully articulate the rationale for including each variable. One plausible approach is to begin with the risk predictions provided by the actuarial scale, and adjust these predictions (up or down) based on empirically validated risk factors that were not considered in the development of the original actuarial scale. In most cases, the optimal adjustment would be expected to be minor or none at all.

The Structured Risk Assessment (SRA) framework developed by David Thornton is one example of a structured approach to combining actuarial risk scales with other empirically based risk factors. The current version of SRA uses Static 99 as the first step in risk assessment. The second step uses the offenders' functioning on dynamic risk factors to revise this initial classification. Medium risk cases are re-classified as high risk if their functioning is psychologically similar to high risk offenders, and it is reclassified down to lower risk if their functioning is psychologically similar to low risk offenders. The third step uses information devised from response to treatment. The fourth step considers the offenders' typical offence pattern in conjunction with situational risk factors. This kind of system reflects the complexity of the real situations in which risk assessment takes place. At each stage the system is empirically based, becoming actuarial where practical and elsewhere using lesser, although still credible, forms of evidence (bi-variate analyses, retrospective analyses, etc.) Two recent prospective studies (Allam, 1998; Clark, 1999, personal communication) found that the key dynamic components of the SRA improved upon assessments using solely static factors.

Although Static-99 can meaningfully differentiate between sex offenders with higher or lower probabilities of recidivism, the labels used to describe the various risk levels (low, medium-low, medium-high, high) do not reflect any absolute standard of risk. The standard of tolerable risk depends on the context of the assessment. An offender with a 10% chance of sexual recidivism over 15 years may be an good candidate for conditional release (i.e., "low" risk), but an unacceptably high risk for holding positions of trust over children.

Conclusion

The present study is part of growing body of research supporting empirically based risk prediction for sexual offenders. No risk prediction scheme will be entirely accurate, and the measures described in the current article are far from perfect. Nevertheless, the current results are a serious challenge to sceptics who claim that sexual recidivism cannot be predicted with sufficient accuracy to be worthy of consideration in applied contexts. The value of unstructured clinical opinion can be questioned, but there is sufficient evidence to indicate that empirically based risk assessments can meaningfully predict the risk for sexual offence recidivism. It is up to future researchers and clinicians to build upon the foundations that have been already established.

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APPENDIX I

Coding rules of Static-99.

Risk Factor	Codes		Score
Prior Sex Offences (Same rules as in RRASOR)	Charges None 1-2 3-5 6 +	Convictions None 1 2-3 4 +	 0 1 2 3
Prior sentencing dates (excluding index)	3 or less 4 or more		0 1
Any convictions for non-contact sex offences	No Yes		0 1
Index non-sexual violence	No Yes		0 1
Prior non-sexual violence	No Yes		0 1
Any Unrelated Victims	No Yes		0 1
Any Stranger Victims	No Yes		0 1
Any Male Victims	No Yes		0 1
Young	Aged 25 or older Aged 18 – 24.99		0 1
Single	Ever lived with lover for at least two years? Yes No		 0 1
Total Score	Add up scores from individual risk factors		

Notes

Static 99 is intended for males aged at least 18 who are known to have committed at least one sex offence.

1) Prior sex offences. Count only officially recorded offences. These could include a) arrests and charges, b) convictions, c) institutional rules violations, and d) probation, parole or conditional release violations arising from sexual assault, sexual abuse, sexual misconduct or violence engaged in for sexual gratification.

Non-sexual offences resulting from sexual behaviour would also be included as sexual offences (e.g., voyeur convicted of trespass by night). When the offence behaviour was sexual, but resulted in a conviction for a violent offence (e.g., assault, murder), then the offender is considered to have committed both a sexual and non-sexual violent offence and could receive points for both items.

Count only the number of sexual convictions or charges prior to the index offence. Do not count the sex offences included in the most recent court appearance. Institutional rule violations and conditional release violations count as one charge. Use either charges or convictions, whichever indicates the higher risk. More detailed worked examples of scoring prior offences are given in the RRASOR scoring guidelines (Phenix & Hanson, in press).

2) Prior sentencing dates. Count the number of distinct occasions on which the offender has been sentenced for criminal offences of any kind. The number of charges/convictions does not matter, only the number of sentencing dates. Court appearances that resulted in complete acquittal are not counted. The index sentencing date is not included.

3) Non-Contact Offences. This category includes convictions for non-contact sexual offences, such as exhibitionism, possessing obscene material, obscene telephone calls, and voyeurism. Self-reported offences do not count in this category.

4) Index Non-sexual Violence. Refers to convictions for non-sexual assault that are dealt with on the same sentencing occasion as the index sex offence. These convictions can involve the same victim as the index sex offence or they can involve a different victim. All non-sexual violence convictions are included providing they were dealt with on the same sentencing occasion as the index sex offences. Example offences would include murder, wounding, assault causing bodily harm, assault, robbery, pointing a firearm, arson, and threatening.

5) Prior Non-sexual Violence. The category includes any conviction for non-sexual violence prior to the index sentencing occasion.

The previous items (Items 1-5; prior offences) are based on officially records. The following items are based on all available information, including self-report, victim accounts, and collateral contacts.

6) Unrelated Victim. A related victim is one where the relationship would be sufficiently close that marriage would normally be prohibited, such as parent, uncle, grand-parent, step-sister.

7) Stranger Victim. A victim is considered to be a stranger if the victim did not know the offender 24 hours before the offence.

8) Male Victim. Included in this category are all sexual offences involving male victims. Possession of child pornography involving boys, however, would not count in this category.

9) Young. This item refers to the offender's age at the time of the risk assessment. If the assessment concerns the offender's current risk level, it would be his current age. If the

assessment concerns an anticipated exposure to risk (e.g., release, reduced security at some future date), the relevant age would be his age when exposed to risk. Static-99 is not intended for those who are less than 18 years old at the time of exposure to risk.

10) Single. The offender is considered single if he has never lived with a lover (male or female) for at least two years. Legal marriages involving less than two years of co-habitation do not count.

TRANSLATING STATIC 99 SCORES INTO RISK CATEGORIES

Score	Label for Risk Category
0,1	Low
2,3	Medium-Low
4,5	Medium-High
6 plus	High

Appendix F

Coding Rules for Modified Scoring

Appendix F

Details of Coding Rules for Modified Scoring

Scored as one charge	Not scored
❑ Repeated incidents of sexual behaviour involving a consenting partner in public places (i.e. a public washroom) as reported by community member or staff.	❑ One or two incidents of sexual behaviour involving a consenting partner in a public place.
❑ Reports of repeated sexual offending behaviour through unofficial report (i.e. complaint by community member or staff).	❑ Allegations where the individual could not be placed in the location at the time of the alleged occurrence.
❑ Single complaints to a support person that an individual had sexually offended, and the individual had the opportunity to be in the vicinity where the alleged activity occurred.	❑ Inappropriate sexual behaviours such as brief touching of another over clothing, briefly rubbing oneself in the genital area over clothing.
❑ Staff reporting to the support agency that they had been grabbed in a sexual manner, or a complaint from a peer that they had been touched in a sexually assaultive manner, provided that evidence existed to substantiate the complaint.	❑ Collections of pictures of children and staring at or following children.