A CONDITIONAL PROBABILITY APPROACH TO RISK ASSESSMENT FOR CHILD SEXUAL OFFENDERS WITH DIFFERENT CLASSES OF VICTIM

Report for the Criminology Research Council

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Table of Contents

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Executive Summary

Those who work with offenders have become increasingly interested in finding ways of accurately predicting the likelihood of an individual re-offending. A number of risk assessment tools designed specifically to assess risk in child sexual offenders are now available. Most of these tools employ an actuarial approach whereby any assessment of risk is based on the statistical probability of offenders, defined by membership of a specific group, offending over a fixed period of time. While actuarial methods of risk assessment are generally considered to be more accurate and more reliable than other methods, they are limited in their capacity to guide decision making about how best to manage the risk presented by a particular individual. Risk assessment for the purposes of risk management may be referred to as *specific risk assessment.* This type of risk assessment requires that a judgment about risk is made for a specific individual in a specific set of circumstances. A specific risk question that is often posed is about the risk *to a particular potential victim*, rather than the risk of the offender committing *any* further offence.

There are several circumstances in which specific risk assessments are required, of which three commonly occur in practice. The first is when a known offender requests access to children. This may occur when offenders enter new relationships and seek to move into families. A second circumstance occurs when new allegations of child sexual abuse are made against ex-offenders, but there is insufficient evidence to prove a case. A third situation when professionals have to make decisions about the extent to which children will be placed at risk of sexual victimization is when sexual offenders are released from prison back into families.

Actuarial risk assessment measures are generally considered as having limited utility in answering these types of specific question. While they provide estimates of how likely it is that offenders with similar profiles will re-offend, they do not offer information about the risk presented to a particular child. However, many of those professionals who criticise the sole use of actuarial risk assessment methods in individual decision-making have not suggested alternative methods. This is probably because any alternatives, especially clinical judgements of risk, are difficult to defend in any legal context due to a lack of empirical evidence to support the reliability of such assessments. The current recommendation of many experts in the field is to use an approach that employs actuarial tools to ascertain a probabilistic estimate of recidivism as well as structured guidelines to provide an overall estimate of risk, then using these instruments to provide a platform from which to assess individual circumstances. This approach, known as the clinically adjusted actuarial process, involves basing the risk

assessment on actuarial methods, but then including professional judgement in any final classification of risk. The obvious danger in using this approach in preference to a purely actuarial one is that additional considerations may lessen the risk assessment accuracy and the likelihood of adjusting a correct actuarial assessment to an incorrect one is greater than that of adjusting an incorrect assessment to a correct one.

In recent years, however, advances in the application of Bayes' Theorem to forensic issues offer new possibilities for this type of specific risk assessment. A conditional probability approach using Bayes' Theorem can incorporate information from actuarial instruments into a framework of individual risk assessment, thus avoiding some of the problems with the clinically adjusted actuarial approach. A Bayesian approach can combine the flexibility and individual focus of the clinical approach with the empirical foundation of the actuarial approach. Thus, a Bayesian approach offers a potentially useful approach to specific risk assessment. This research examines the utility of this approach to risk assessment of child sexual offenders using conditional probabilities derived from Bayes' Theorem.

A first stage in applying a Bayesian approach involves the collection of descriptive data about offenders and their offences. In this study, data extracted from clinical files on over 300 male child sexual offenders (and their victims) who were current and past clients of a community based child sexual offender treatment program in South Australia were entered into a research database. Each offender was then classified according to the number of known previous victims (based on convictions, charges and allegations), and the gender or familial relationship to known victims.

Those variables that discriminated between those offenders who were known to have offended against a single victim and those who had known multiple victims were identified and combined into a scale. Analysis suggested that this scale was likely to have moderate predictive accuracy in classifying offenders. Five of the six variables identified using this approach have previously been identified as important predictors of sexual recidivism in actuarial risk assessment tools. Although not identified as a risk factor in other actuarial risk assessment tools, a self-reported history of childhood sexual abuse did discriminate between single victim and multiple victim child sexual offenders in this study. It is possible that such data were not available to those involved in the development of other actuarial tools, many of which were developed from information contained in criminal justice records. The inclusion of this variable is unsurprising given the extent to which childhood victimization has been implicated theoretically in previous attempts to understand the aetiology of child sexual

offending. This finding offers some support for practitioners who identify offenders' own history of abuse as relevant to treatment designed to reduce the risk of recidivism.

Analyses were subsequently carried out to establish which variables discriminated between sub-groups of child sexual offenders, specifically those with single gender versus cross-gender (male and female) victims for gender, and those with single relationship versus cross-relationship (intra-familial and extra-familial victims). This information is particularly relevant to specific risk questions. Discriminating variables were combined into specific risk scales for gender and relationship to victim. Scores on these scales were then used to demonstrate the Bayesian approach to individual risk classification. Bayes' Theorem was used to calculate the probability that an individual obtaining a particular score on the scale belonged to the criterion group, for example offenders against intra-familial and extra-familial victims. Confidence intervals around these individual probabilities were calculated using a probability density function known as the Beta Distribution. In order to calculate confidence intervals, beta distributions were calculated for the base rate or prior probability, sensitivity (true positive rate), and false positive rate. Repeated sampling resulted in a beta distribution of Bayesian posterior probabilities, from which 95% confidence intervals around the probability of belonging to the criterion group could be drawn. The results show how scores on an actuarial risk assessment scale may be individualised for a particular offender.

As an example, an individual sexual offender comes from a sample of 150 sexual offenders with known familial victims, of whom .20 or 30 individuals would also have non-familial victims. Thus, the base rate, designated P(B+), of offenders with both types of victims is .20. The individual receives a score of 1, a low score, on the specialized risk scale that discriminates offenders with intra-familial victims only from offenders with intra-familial and extra-familial victims with moderate accuracy. The sensitivity of that score, designated P(S+/B+), on the risk scale = .19. The false positive rate, designated P(S+/B-), of that score = .57. The probability that the individual belongs to the group of offenders with both types of victims, given his score, may be designated P(B+/S+).

Bayes' Theorem for this question may take the form:

$$P(B+/S+) = \frac{P(S+/B+) * P(B+)}{[P(S+/B+) * P(B+)] + [P(S+/B-) * 1 - P(B+)].}$$

The probability that the individual belongs to the group of offenders with familial and non-familial victims is .08. The 95% confidence intervals for this value, obtained using repeated sampling from beta distributions, are from .03 to .16.

In conclusion, this project demonstrates a method of individualising scores on actuarial risk assessment measure in a way that makes them more meaningful for those involved in decision-making about individual child sexual offenders. At present, the only quantifiable approach to specific decision-making relies on a general prediction of future behaviour, based on group data. The Bayesian approach is one method that can be used to assist decision-makers to use this information in ways that lead to the more appropriate management of risk. Ultimately, the better management of known child sexual offenders will lead to fewer offences and a reduction in the numbers of children whose lives are profoundly affected by sexual victimisation.

Introduction

There is no doubt that child sexual abuse[1] is a serious social problem. Not only is the prevalence of child sexual abuse disturbingly high, but there is also a convincing body of evidence that childhood sexual abuse leads to a wide range of psychological and medical difficulties in later life. Although difficulties in the selective reporting of child sexual abuse make it impossible to calculate an absolute figure as to the actual percentage of children being sexually abused, the available research suggests that the numbers of victims are high. Retrospective studies, such as that conducted by Finkelhor (1994c) in the USA, have found that as many as 20% of women and 5 to10% of men report having experienced some form of childhood sexual abuse, while a review of international studies from 19 countries found rates between 7% and 36% for women, and 3% and 29% for men (Finkelhor, 1994b). A more recent review by Paolucci, Oddone, Genius, and Violato (2001) suggested that approximately 15-20% of children and adolescents have experienced child sexual abuse. While official records suggest that more offences are committed against female children, the number of male children who are sexually abused may be greater than previously thought (Smallbone & Wortley, 2001). It is likely that most perpetrators are men, with somewhere between 4% and 17% of men acknowledging that they have sexually offended against a child (Herman, 1990).

It is increasingly clear that child sexual abuse has serious, and often catastrophic, consequences for children. In a meta-analytic review[2] aggregating the results of 38 separate studies linking childhood sexual abuse and adult psychological problems, Neumann et al. (1996) found an association between childhood sexual abuse and adult mental health problems, including anxiety, anger, depression, re-victimisation, self-mutilation/self-harm, sexual problems, substance abuse, suicidality, impairment of self-concept, interpersonal problems, obsessions and compulsions, dissociation, post-traumatic stress responses and somatization. Consistent with these findings, Bagley and Ramsay (1985) found that sexually abused women were five times more likely than the general population to have attempted suicide or to have received recent psychiatric treatment.

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[1] Sexual abuse is used in this report to refer to "the perpetrator exposing any sex parts, or threatening to have sex, or touching sex parts of the victim's body, or attempting or committing a sexual assault" (Badgley, 1984, cited by Greenberg, Bradford, Firestone & Curry, 2000, p.1485).

[2] Meta-analysis is a statistical method for aggregating the results of many different studies involving large number of participants. Reviews of this type are generally considered as offering reasonably robust findings.

Of course, this does not mean that victims of child sexual abuse will inevitably experience mental health problems in adult life. Clearly, child sexual abuse has different impacts for different children. Given this, Paolucci et al. (2001) suggest that abuse is more appropriately regarded as a life event than a disorder or syndrome with specific symptomatology. Although there is currently little conclusive evidence to determine the particular factors associated with sexual abuse that lead to greater harm, there have been suggestions that severity of symptomatology is related to the severity of the abuse. For McConaghy (1998), more serious sexual abuse involves penetration, occurs over long periods and at high frequency, involves the use of force, and occurs in situations where the perpetrator is known to the victim. Other factors, such as other stressful life events and the attitude of parents or caregivers towards the abuse, may also moderate the extent to which sexual abuse leads to harm (Paolucci et al., 2001), and clearly some children and families will be more resilient than others (Smallbone & Wortley, 2001; Prentky, Harris, Frizzell, & Righthand, 2000).

In short, child sexual offending is appropriately regarded as extremely harmful. Consequently, resources should be directed at both helping children and their families deal with the impact and consequences of victimization and at preventing offending from re-occurring. In a recent meta-analytic review, Hanson, Gordon, Harris, Marques, Murphy, Quinsey and Seto (2002) have reported that at least 1 in 10 known sexual offenders will go on to commit further offences[3]. While at present there is no way of identifying those people who are likely to commit child sexual offences prior to a first offence, it is possible to intervene with known perpetrators to reduce the risk of further offending. Interventions typically involve criminal sanctions aimed at both punishing and deterring offenders and psychological treatments aimed at addressing the causes of the offending. Often such treatments occur within the context of the formal supervision of behaviour, as is the case with parole orders. Despite recent debate over the effectiveness of sex offender treatment programs, and the difficulties of assessing changes in recidivism given the low base rate of re-convictions, sex offender treatment does appear to have a modest impact on recidivism rates. In their review, Hanson et al. (2002) found that current sexual offender treatment led to a relative reduction in recidivism of 40%. The absolute reduction in recidivism was around 7%, in that current treatments were associated with a sexual recidivism rate of 9.9%, compared to a 17.4% in untreated groups. Across the 38 treatment outcome studies included in their review, the sexual

[3] The real number may, of course, be higher than this given the probable under-reporting and difficulties in securing convictions for child sexual offences.

recidivism rate was 16.8% for the comparison groups, compared with 12.3% for those in the treatment groups.

Risk Assessment

Methods of predicting who will re-offend (and who will not) are commonly known as risk assessments. Implicit in any attempt to assess risk is the belief that some individuals are less at risk of re-offending than others (Studer, Clelland, Aylwin, Reddon, & Monro, 2000). In this context, the term risk refers to the risk of further sexual re-offending, although some researchers have also investigated the risk of child sex offenders committing further non-sexual offences.

A considerable amount of empirical work over the last decade has sought to identify those factors that are associated with sexual recidivism (e.g., Hanson & Thornton, 1999; Hanson & Harris, 2001). Risk factors are variables that impact systematically on recidivism, either by increasing or decreasing its likelihood. They can be described as either static or dynamic. Static factors are those that are unchanging, such as a person's previous offending history. Dynamic risk factors are changeable, and may be either stable or acute. Stable dynamic risk factors are not expected to change for an extended period of time (i.e., months or years) whereas acute dynamic factors may change in hours or days. Therefore, although acute dynamic factors (e.g., intoxication) may impact upon the likelihood of offending at a given time, stable dynamic risk factors (e.g., chronic alcohol dependency) may be more associated with long-term recidivism (Hanson & Harris, 2000).

Predicting whether someone will commit further sexual offences typically involves establishing which risk factors are relevant to the individual case. Assessment has typically been based on two main approaches, commonly known as the ***clinical*** and the ***actuarial***. There has been considerable, and at times heated, debate between practitioners and researchers about the value of each approach (e.g., Harris, 2003; Lievore, 2003). Clinical predictions of risk primarily involve professional judgments about an individual's likelihood of re-offending based upon a practitioner's knowledge of that individual[4]. Actuarial, or statistical, predictions are based on empirically established correlations between a risk measure (typically based on known characteristics of both the offender and the offence) and recidivism. It is a commonly expressed view that the accuracy of purely clinical approaches to risk assessment is less than those that are based on actuarial methods (McCarthy, 2001;

[4] For a more detailed account of clinical risk assessment methods please see Appendix 2.

Harris, 2003; Quinsey, Harris, Rice, & Cormier, 1998). This view is based, in part, upon a large body of empirical evidence comparing predictions in both psychology and medicine. Two meta-analyses of the relative effectiveness of clinical and actuarial approaches for making predictions in these fields (Grove & Meehl, 1996; Grove, Zald, Lebow, Snitz, & Nelson, 2000) have both reported that actuarial approaches are more accurate than clinical approaches[5].

Actuarial Risk Assessment

Actuarial methods of risk prediction attempt to combine known risk factors into a structured assessment (McCarthy, 2001). The most mechanical approach, the *purely actuarial approach*, involves assessing risk solely on the basis of the statistical probability that offenders with a particular set of characteristics will re-offend. The *clinically adjusted actuarial approach* involves the use of one or more actuarial instruments followed by adjustments based on clinically derived case considerations (Doren, 2002).

The last ten years have seen the proliferation of a number of actuarial risk assessment measures designed specifically for use with perpetrators of sexual offences, including the Rapid Risk Assessment for Sexual Offense Recidivism (RRASOR), the Structured Anchored Clinical Judgment (SACJ-Min), the Static-99, and the Violence Risk Appraisal Guide (VRAG), and the Sex Offense Risk Appraisal Guide (SORAG)[6]. These measures vary both in terms of their content and in the extent to which they have been validated for use with different populations. However, they generally offer a method for assessing risk of re-offending on the basis of the presence or absence of a number of static risk factors. Some measures also include an interview-based assessment to identify dynamic risk factors (or 'criminogenic needs'). All of the measures provide a composite score or rating of the overall level of risk that an individual offender presents, often reported in terms of the probability of someone with a similar offence history offending again within a set period of time. Most commonly, scores are converted into probability tables of success versus failure over different time intervals, and these projected outcomes are then used in conjunction with a decision as to what level of risk is considered to be acceptable (Lanyon, 2001). Doren (2002) has recently

[5] Hart, Laws, and Kropp (2003) have recently re-examined these reviews. With reference to the more comprehensive quantitative review, they noted that while the actuarial approach was equal to or superior to the clinical approach in 80% of comparisons, the clinical approach was equal or superior in 60% of comparisons. The typical increment in predictive accuracy when actuarial approaches were superior was about 10%. Hart et al. (2003) also noted that relatively few reviewed studies examined the prediction of violence, and none examined predictions of sexual violence. They concluded that the superiority of actuarial decision making in this context is, at present, an article of faith.

provided the helpful addition to the field of actuarial risk assessment of calculating confidence intervals for each score category of three risk instruments: the VRAG, RRASOR, and Static-99.

The ***Rapid Risk Assessment for Sexual Offence Recidivism*** (RRASOR; Hanson, 1997) was initially developed to enable the prediction of sexual offence recidivism using a small number of variables that were easily scored. Based on meta-analysis and multiple regression, the variables chosen were prior sex offences, current age, victim gender, and relationship to victim. The RRASOR has high inter-rater reliability and considerable evidence of predictive validity from at least seventeen studies (Doren, 2002). One study by Janus and Meehl (1997) found that the RRASOR's specificity, or ability to identify those offenders who would not re-offend, is high at 97%. However, it only correctly identified 15% of offenders who went on to re-offend, leaving 85% of recidivists incorrectly classified as 'no' or 'low' risk.

The Structured Anchored Clinical Judgment (SACJ, Grubin, 1998) utilises a step-wise approach to classify offenders into low, medium, and high-risk categories based on prior official conviction records. It then reclassifies up or down according to additional factors. The ***Static-99*** was developed by including static risk factors from the RRASOR and SACJ in an attempt to improve coverage of risk variables beyond that of the RRASOR. The Static-99 has high inter-rater reliability and evidence of predictive validity from at least fifteen studies (see Doren, 2002). A comparative analysis between the RRASOR, SACJ and Static-99, using four samples in Canada and the United Kingdom, found that the Static-99 had greater predictive accuracy than the other two instruments (Hanson & Thornton, 2000).

The ***Violence Risk Appraisal Guide*** (VRAG; Quinsey et al., 1998) is based on twelve items known to be associated with violence likelihood (including psychopathy, alcohol misuse history, school maladjustment, and victim injury). It was designed to assess the risk of violence in previously convicted violent offenders. The VRAG has high interrater reliability, and its validity has been supported in numerous studies (Doren, 2002). For sexual recidivism, its predictive validity is lower than the RRASOR (Hanson, 1997). The ***Sexual Offending Risk Assessment Guide*** (SORAG; Quinsey et al., 1998) is a modification of the VRAG, with which it shares a number of items. The predictive validity of the SORAG was weaker than the Static-99 when used with the data set on which the SORAG was developed.

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[6] For a recent review of these measures, see Beech & Ward (in press).

The ***Minnesota Sex Offender Screening Tool -Revised*** (MnSOST-R; Epperson et al., 1999) contains sixteen items that relate to offence information and historical information about the offender. Inter-rater reliability is acceptable, but lower than for the RRASOR and Static-99. The MnSOST-R has been the subject of fewer studies than other actuarial instruments described above. There have been three attempted replications of the instrument's validity, but strong support for the validity of the MnSOST-R has not been found. In a study by Barbaree and colleagues (Barbaree, Seto, Langton, & Peacock, 2001) the MnSOST-R predicted general recidivism but did not significantly predict sexual recidivism in a sample of sex offenders.

Empirical Issues in Actuarial Risk Assessment

Generalisability

An important issue in any decision to use an actuarial risk assessment is that of the generalisability of the instrument. The predictive validity of an actuarial measure is only established for the population upon which it has been validated. Theoretically, each measure should therefore be re-validated for the population for which it is to be used, unless there are strong grounds to suggest that the populations do not differ in any systematic way. This is a particularly important issue in the sexual offender field, where the population is often defined either by known (if not convicted) offenders or by the service received. Given that definitions of sexual offending and penalties imposed may vary between jurisdictions (for example, there is no common age of consent across Australia), it is possible that offender populations vary considerably, and systematically, between jurisdictions. Actuarial measures that have been developed on sexual offenders resident in prison, for example, may be poor predictors of recidivism in sexual offenders attending community based programs, given that prison populations are likely to be made up of more serious offenders. Another obvious question in an Australian context is the extent to which risk assessment tools validated in other countries are able accurately to predict recidivism in Indigenous sexual offenders. It is possible that both risk factors and recidivism rates for this group are substantially different from those found in dominant culture offenders (see Day, Howells & Casey, 2003). It follows that any tool should be validated upon the population for which it is to be used if assessors are to be confident of the accuracy of any predictions.

Development of the most established instruments for sex offender recidivism prediction requires very large numbers of cases from multiple sites and comprehensive

recidivism data (Hanson & Thornton, 1999). In practice this means that current data sets are not sufficient to allow for the prediction of specific offences, as information is available for only a very small numbers of re-offenders. Sjöstedt and Grann (2002) examined the prediction accuracy of the RRASOR and Static-99 for recidivism in general, and for recidivism of a variety of offence characteristics, such as familial victims, stranger victims, victims under 15 years of age, or re-offending within one month. Although their initial database held more than 1,200 cases, the low recidivism rate of 6% over an average follow-up time of 5.68 years meant that their sample contained only 75 recidivists. When they examined recidivism of specific offences, their sample contained only 3 re-offenders within one month (0.2%) and approximately 38 re-offenders (3%) against victims under 15 years of age.

Predictive accuracy

Even the most promising actuarial instruments for assessing risk of sexual violence (the RRASOR and Static-99) show only moderate predictive accuracy. Sjöstedt and Långström (2002) in a cross-validation of the RRASOR and Static-99, found that the RRASOR missed an estimated 63% of recidivists and the Static-99 missed an estimated 51% of recidivists when used with the optimal cut-off scores, claimed to produce the greatest level of classification accuracy. The fact that actuarial instruments incorrectly classify significant numbers of offenders is a particular issue when these measures are used to guide decision-making about individuals (rather than, for example, as a guide to service planning). In this circumstance, any misclassification is likely to lead to the inappropriate management of an offender, with potentially serious consequences.

Offender heterogeneity

A third empirical issue in the decision to use actuarial risk assessment instruments is that most have been developed to predict 'any re-offending', and make few distinctions between the type or nature of the offending. In their recent study, Sjöstedt and Grann (2002) examined the predictive utility of a number of actuarial instruments across different types of re-offending and over different time periods. They found that, while actuarial assessment proved useful for less 'severe' re-offending, the more serious sexual recidivism was not accurately predicted. In addition, they were not able to differentiate between those who re-offended against members of their own families and those who did not re-offend. This study is significant in that it suggests that although actuarial risk assessment methods probably provide more reliable general estimates of risk of re-offending than clinical methods, they have not been developed in ways that allow the assessor to discriminate between different types of offenders or offences. In other words, they assume that all (child) sexual offences and (child) sexual offenders are similar.

Consequently the extent to which all sexual offenders should be considered as a homogenous group is a critical issue in any decision to use actuarial tools. Polaschek (2003) has argued that although finding ways to classify sexual offenders[7] in a reliable and valid manner is likely to improve our management of offenders, the topic has received only 'sporadic' attention in the literature. In her review, she reaches two conclusions: first, that sexual deviance comprises a wide range of sexual behaviours, and offenders are highly heterogenous; second that there are no natural classification schemes (see also Bickley & Beech, 2001).

The most influential attempt at classifying sexual offenders has been the typology developed by Groth and Birnbaum (1978). Groth and Birnbaum distinguished between what they called 'fixated' and 'regressed' offenders. Fixated offenders, according to these authors, have a compulsive attraction to children dating back to adolescence, whereas regressed offenders begin offending as adults in response to stress and view their victims as pseudo-adults. Knight and Prentky (1990) later identified nine subtypes of child sexual offender: the opportunistic (with high or low social competency), pervasively angry, sadistic (overt or muted), sexual non-sadistic (high and low social competency) and vindictive (moderate or low social competency). However, as Polaschek (2003) notes, the typology is very complex and has had little impact upon clinical practice.

Danni and Hampe (2000) have more recently attempted to simplify this typology into three broad categories (based on the work of Prendergast, 1991), which they labelled 'paedophile', 'hebephile' and 'incest'. In their view, a paedophile offender is "typically abused before the age of 14, and this experience will often manifest itself in a deviant arousal pattern" (p.493). Hebephiles "usually have age-appropriate relationships but will perpetrate against a child who is at the same level of development they were when they felt the most secure" (p.493). Incest offenders, on the other hand, "do not view their victims as playing any role in the sexual act and sexually abuse their victims for the sake of their own selfish pleasures" (p.494).

Beech and Ward (in press) suggest that Hall and Hirschman's (1992) quadripartite theory can be used to understand characterisations of three different types of offender. The 'preferential' offender is defined as having deviant sexual arousal and strong sexual preferences for children. 'Incest' offenders typically misinterpret children's behaviour as

[7] Polaschek includes both adult (rapists) and child sexual offenders in her review.

sexually provocative, and a final group of preferential offenders experience chronic problems in establishing age-appropriate relationships.

While there is currently no conclusive empirical evidence to support such sub-classifications of offenders, the interest in developing typologies suggests that, from a clinical perspective at least, there are important differences between sub-groups of child sex offenders and that most of these differences exist in relation to the type of sexual act and the relationship of the victim to the offender. Indeed, classifying sexual offenders on the basis of victim choice is one method of classification that has received some empirical validation (Bickley & Beech, 2001). Guay, Proulx, Cusson, and Ouimet (2001), for example, found that victim preferences remained stable across repeated sexual offence occasions. These findings were not supported, however, in a recent study (involving a different population) by Heil, Ahlmeyer, and Simons (2003). They found that relatively few sex offenders abuse only one type of victim, concluding that although sex offenders may have "a preferred victim, this preference can change over time and may be expanded when the preferred victim is unavailable" (p.233). Evidence supporting the distinction between offender subgroups based on victim characteristics (sex of victim, the relationship to victim, and the age of victim) is discussed later in this report. The extent to which known offenders are likely to have stable victim preferences, or to offend against any child when given an opportunity, is particularly important in determining appropriate approaches to risk management.

Specific Risk Assessment

The three empirical issues identified in this review as relevant to any decision to use an actuarial risk assessment tool (generalisability, predictive accuracy and offender heterogeneity) become relevant when actuarial tools are used to guide decisions about the appropriate management of a particular individual offender. Risk assessment for the purposes of risk management may be referred to as ***specific risk assessment.*** This type of risk assessment requires that a judgment about risk is made for a specific individual in a specific set of circumstances. A specific risk question that is often posed is about the risk *to a particular potential victim*, rather than the risk of the offender committing *any* further offence.

Parole boards and community corrections agencies have to determine those restrictions (in terms of parole conditions) that are likely to minimize the risk of further sexual offending. Often parole conditions for child sexual offenders will include restrictions on

access to children, or not living near schools, in an attempt to manage any risk environmentally. There are several circumstances in which specific risk assessments are required, of which three commonly occur in practice. The first is when a known offender requests access to children. This is particularly common in the case of incest offenders who seek to return to the family home following a period of imprisonment, but may also occur when offenders enter new relationships and seek to move into families. Greenberg, Bradford, Firestone, and Curry (2000) have argued that "child protective agencies, parole officers and judges are often faced with perplexing decisions on whether to allow various degrees of access of incest perpetrators with a previous and subsequently now empowered older victim or their other non-abused biological children from the same family as the victim" (p.1493).

A second circumstance where specific judgments of the risk are required occurs when new allegations of child sexual abuse are made against ex-offenders, but there is insufficient evidence to prove a case. Bow, Quinnell, Zaroff, and Assemany (2002) have discussed how mental health professionals should assess allegations of sexual abuse in child custody cases. They argue that professionals should not only assess the motives behind the allegation and existing family dynamics, but also have knowledge of forensic areas, including the assessment of alleged sexual offenders. In their study, they reported that the majority of (US) psychologists conducting assessments of child abuse relied upon their own protocols for these assessments, with only 30% using any formal protocol, model, or guidelines in their assessments.

Actuarial risk assessment measures are generally considered as having limited utility in answering specific questions of this kind. While they provide estimates of how likely it is that offenders with similar profiles will re-offend, they do not offer information about the risk presented to a particular child. As Bickley and Beech (2001) put it, "whilst they may statistically identify a group of men who are at higher risk of recidivism (or more accurately, reconviction), they often tell us little about an individual offender" (p.59). Berlin, Galbreath, Geary, and McGlone (2003) have further suggested that "actuarials can potentially be very misleading if one incorrectly attributes the overall risk of a previously screened group to a specific individual within it" (p.381). Thus, while the results of actuarial risk assessments may be useful in determining an appropriate period of detention or intensity of treatment (see Andrews & Bonta, 1998), they may be less useful when applied to individual cases, particularly in the absence of accurate confidence levels associated with these predictions (Berlin et al., 2003).

An alternative to actuarial risk assessment, though not an entirely satisfactory one, is the ***Sexual Violence Risk-20*** (SVR-20; Boer, Hart, Kropp, & Webster, 1997), essentially a method of clinical risk assessment. This instrument allows clinicians to assign different relative weights to risk variables, based on features of the individual case features. The SVR-20 lists 20 risk factors for sexual offending identified by the authors from a review of relevant literature, grouped into domains of Psychosocial Adjustment, Sexual Offending History and Associated Attitudes, and Future Plans. However, there is no algorithm for combining risk factors.

A recent review by Boer and Boer (2003) concluded that "there is no clear answer to aid clinicians in the selection of which [risk assessment tools] to use with which client" (p.6). Boer and Boer's recommendation is to use an approach which employs actuarial tools to obtain a probabilistic estimate of recidivism as well as structured guidelines to provide an overall estimate of risk, then to use this estimate to "provide a platform from which to discuss changes in dynamic risk factors in order to provide an estimate of the client's current level of manageability" (p.6). This approach, known as the *clinically adjusted actuarial process*, involves basing the risk assessment on actuarial methods, but then including professional judgement in any final classification of risk (Campbell, 2003).

The danger in using this approach in preference to a purely actuarial one is that additional considerations may lessen the risk assessment accuracy (Quinsey et al., 1998). Hanson and Bussiere (1998) have warned that combining actuarial and clinical risk assessments may 'dilute' the accuracy of the actuarial assessment, with Campbell (2003) suggesting that the likelihood of adjusting a correct actuarial assessment to an incorrect one is far greater than that of adjusting an incorrect to a correct one.

Doren (2002) suggested that clinical adjustments to actuarial results are appropriate in three types of circumstances: (a) when research has demonstrated that the clinical factors add incrementally to the predictive accuracy of actuarial instruments; (b) when case information needed is beyond actuarial instruments, such as lifetime risk of re-offending; or (c) when case characteristics are rare but probably meaningful, such as an offender who strongly insists he will re-offend, or sexual sadism. Circumstances described in (b) and (c) clearly involve a decision to step outside an actuarial scheme, treating actuarial scores and clinical information as separate pieces of information that are combined in a clinical process. They will not be discussed further here. Circumstances described in (a) involve dynamic risk factors such as completion of treatment (see McGrath et al., 2001 or Beech, Fisher, & Thornton, 2001), or dynamic variables such as intimacy deficits, attitudes tolerant of sexual assault, or self-

regulation (see Hanson & Harris, 2001). Such dynamic variables have been demonstrated to improve the predictive accuracy of actuarial instruments in *group* studies. However, the making of clinical adjustments to actuarial predictions has serious limitations as a general strategy in the assessment of *individuals*.

The use of an actuarial instrument with a particular offender results in a statement to the effect that "Mr X scored a ?? on this risk assessment instrument. Individuals with these characteristics, on average, sexually reoffend at ?? % over five years," (Harris, Phenix, Hanson, & Thornton, 2003, p.71). Adjusting this estimate by considering additional individual clinical factors may indicate that Mr X's true risk of recidivism lies above or below the group average of ?? %, but there can be no accurate indication regarding the degree of adjustment that should be made. If an offender's particular score is associated with, for example, a classification of low risk of recidivism, how many aggravating individual clinical factors are necessary to modify his classification to medium risk? Given this practical problem with integrating clinical factors and actuarial risk assessment, in our view applying the *clinically adjusted actuarial approach* to *specific* risk questions is thus unlikely to be useful.

It therefore seems that at present, and despite the reservations discussed above, actuarial tools offer the only empirically defensible way of making predictions about sexual re-offending. In applying an actuarial risk assessment tool to a specific risk assessment question, the assessor needs to determine the extent to which the tool is valid for use on the population in question, the accuracy of the tool in predicting specific future offending (such as the risk posed to a particular child), rather than the risk of any re-offending, and the extent to which the tool might be valid for particular sub-groups of sexual offenders.

In this research project, an initial aim is to investigate the extent to which those risk factors identified as important predictors of sexual recidivism in previous studies are also likely to apply to a local Australian population of child sexual offenders. Longitudinal studies that seek to identify those factors associated with sexual offender recidivism are beyond the resources of many local services, which are thus often unable to validate actuarial risk assessment instruments with their local population. Historical data contained in clinical case files is, however, readily available, and may be used to identify differences between, for example, those offenders who are known to have single victims and those known to have multiple victims. An initial aim of this project is, therefore, to establish whether a classification scale developed from information contained within case files identifies similar factors to that identified as risk factors in prospective studies. A second aim is to identify

those variables (if any) that discriminate between different sub-groups of offenders. This information is likely to be relevant in the formulation of answers to specific risk questions. Finally, the project aims to demonstrate the use of a Bayesian approach to risk assessment to individualize data from classification scales, such that it is even more relevant to specific risk questions.

A Bayesian Approach to Risk Assessment

Harris (2003) has recently argued that many of those who criticise the sole use of actuarial risk assessment methods in individual decision-making do not offer alternative methods. Harris (2003) suggests that this is because any alternatives, especially unaided clinical judgement, are difficult to defend empirically. In recent years, however, advances in the application of Bayes' Theorem to forensic issues offer new possibilities for risk assessment (Mossman, 2000a,b). A conditional probability approach using Bayes' Theorem can incorporate actuarial instruments into a framework of individual risk assessment, thus avoiding the difficulties of the clinically adjusted actuarial approach described above. A Bayesian approach can combine the flexibility and individual focus of the clinical approach with the empirical focus of the actuarial approach. Thus, a Bayesian approach offers a useful potential approach to specific risk assessment.

Mossman (2000a,b) has applied a Bayesian approach to the assessment of malingered mental disorders. In this context, he noted that legal professionals or jurors do not really need to know that a person has behaved like a malingerer. This information is analogous to that provided by actuarial risk assessment instruments, that a person who obtains a certain score on an instrument is similar to a group of people who have a certain likelihood of re-offending within a specified time period. The information that legal fact-finders need to know, according to Mossman (2000b), is the likelihood that a person is malingering, given certain findings. In the context of risk assessment, a more relevant piece of information would be the likelihood that a person will re-offend within a specified time period, given his obtained score on an instrument. Such information can be elicited through the use of a Bayesian approach.

Aside from Mossman's contributions, a number of papers have appeared in academic literature applying Bayes' Theorem to areas such as assessing evidence in sexual abuse evaluations (Wood, 1996; Fargason, Zorn, Ashworth, & Fountain, 1997; Nezworski & Wood, 1997), and the diagnosis of physical abuse (Kemp et al., 1998). Reviewers of risk assessment approaches with sexual offenders (e.g., Lanyon, 2001) have suggested that such approaches offer some promise in predicting re-offending in child sexual offenders. To the best of our

knowledge, this approach has not previously been applied to child sex offender risk assessment.

Bayes' Theorem is a simple equality among several probabilities that was published by the English clergyman Thomas Bayes (1763). The approach of Bayesian statistics, based on the theorem, provides an alternative to classical statistical inference, with a subjective view of probability. Probabilities are regarded as personal measures of uncertainty, based on available evidence. Subjective probabilities can be used to measure uncertainty about single events (Iversen, 1984). In the Bayesian approach, probability is the quantification of uncertainty in beliefs. In other words, this approach assigns numbers to subjective beliefs, which are then modified in the light of new evidence. It is thus apparent that the Bayesian approach has parallels to clinical assessment, with the difference that it asks clinicians to formulate clinical experience in mathematical terms (Mossman, 2000a).

Bayes' Theorem also localises rather than generalises. A starting point is the importance of considering base rates or prevalence of the phenomenon of interest in the population one is considering (Meehl & Rosen, 1955). For example, a test for schizophrenia with a very high degree of accuracy will perform at its best in a population where 50% of individuals have schizophrenia, but will lead to many errors of classification where the prevalence is very low. Consideration of base rates is the starting point of the Bayesian approach. In this context, it is highly desirable, but often difficult, to obtain base rates of recidivism for the particular population of sexual offenders with whom one is using a particular risk assessment instrument.

Bayes' Theorem results in a conditional probability, such as the probability that an individual belongs to a particular group (e.g., recidivist sexual offenders), based on the test score obtained. In order to yield the desired number, known as a posterior probability, three pieces of information are needed: (a) the prior probability of belonging to a certain group, known as prevalence or base rate; (b) sensitivity of a particular test score or sign; (c) the specificity of a particular test score or sign. The sensitivity is the proportion of those individuals in the group of interest (e.g., recidivists) who have that score or sign. The specificity is the proportion of those not in the group (e.g., non-recidivists) who do not have that score or sign[8].

[8] Actually, the calculation requires 1 – specificity, the proportion of non-recidivists who have that score or sign, also known as false positives.

The theorem is best demonstrated with an example. Suppose one sampled 200 convicted sexual offenders from the population of interest. Forty of them were found to have committed a further sexual offence within five years. Therefore the base rate (or prevalence) of recidivism is 40/200 or 20 %, or there is a 1 in 5 chance that a particular sexual offender from that population will re-offend within five years. If we designate recidivist sexual offenders as R+ and non-recidivists as R-, we can denote the probability that a sexual offender is a recidivist as P(R+) = .20.

The estimate of the likelihood of recidivism can be refined using Bayes' Theorem, incorporating information from an actuarial instrument. For this example we will use the RRASOR. From the technical report on the RRASOR, based on 2,592 individuals (Hanson, 1997), it is possible to extract sensitivity and specificity information[9]. The overall recidivism rate reported in this study was 13.2 %. Suppose that the sexual offender to be assessed receives a score of 5, the highest score obtained by individuals in the study. The five-year adjusted rate of recidivism for individuals with this score was 49.8 %. The resulting sensitivity of the test, or probability of obtaining a score of 5 if a recidivist, designated P(5+/R+), for this score is .076. The specificity, or probability of not obtaining a score of 5 if not a recidivist, designated P(5-/R-), is .988.

Bayes' Theorem for this question may take the form:

$$P(R+/5+) = \frac{P(5+/R+) * P(R+)}{[P(5+/R+) * P(R+)] + [1- P(5-/R-) * 1 - P(R+)]}$$

so that

$$P(R+/5+) = \frac{.076 * .20}{[.076 * .20] + [.012 * .80]} = .61.$$

Thus, there is a 61 % probability that the assessed individual will re-offend within 5 years, based on his RRASOR score. Consider the situation where the individual scored 0 on the RRASOR, the lowest score possible. The corresponding sensitivity and specificity for this score are .07 and .78 respectively. The posterior probability, that the individual scoring 0 will

[9] The number of true positive cases can be denoted as *a*, the number of false positive cases as *b*, the number of false negative cases as *c*, and the number of true negative cases as *d*. Sensitivity = *a/a+c*, and Specificity = *d/c+d*.

re-offend within 5 years, is .07, a low probability. Each score will have a different sensitivity and specificity. As a useful measure of predictive accuracy, the Area under the Curve (AUC) of a Receiver Operating Curve (ROC: a plot of sensitivity against false positives at different base rates) is used to compare tests to each other. This statistic is now commonly quoted in evaluations of actuarial risk instruments (e.g., Sjöstedt & Långström, 2002).

Bayesian Confidence Intervals

Mossman and Hart (1996) advocated the use of Bayes' Theorem for assigning probabilities of malingering, making use of existing small sample studies regarding malingering of mental disorders. In response to Mossman and Hart's (1996) paper, Rogers and Salekin (1998) argued that the calculations reported by Mossman and Hart had such a low degree of precision that they were practically useless. Mossman (2000a, b) subsequently published two articles in which he suggested a method for calculating individual confidence intervals for Bayesian posterior probabilities. Subsequent articles have clarified and refined this approach (Mossman, 2003; Mossman & Berger, 2001). The method involves making use of a probability distribution called the *beta distribution*, used to calculate probability density functions around proportions. The density of a $\beta(a,b)$ beta distribution for a parameter p is given by:

$$\beta_{(a,b)}(p) = Cp^{a-1}(1-p)^{b-1}$$

for $0 < p < 1$. The constant C is chosen so that the total area under the distribution equals 1 (Mossman & Berger, 2001; see Iversen, 1984, or Mossman, 2000b, for further discussion of the formula and parameters of beta distributions).

Mossman's method involves developing three beta distributions for the variables which are combined in Bayes' Theorem: one distribution for base rate of the phenomenon of interest, one for the sensitivity of the test used, and one for the test's specificity or for its false positive rate (Mossman, 2000a, b). This is necessary because published estimates of base rates, sensitivity, and specificity are subject to random sampling error (Mossman & Berger, 2001).

To calculate a beta distribution around the base rate of re-offending, Mossman (2000b; 2003) outlined three possible methods. The first involves an estimate based on one's

knowledge of the base rate of the phenomenon of interest (e.g., malingering). The second involves using an "expert consensus" method for estimating the base rate beta distribution. The third approach uses actual available data, and uses default prior distributions or "noninformative priors". This approach is known as the objective Bayesian method[10]. For calculating beta distributions around sensitivity and specificity, Mossman (2000a,b) suggested using noninformative prior distributions. In a comparison of five methods for calculating posterior probabilities, Mossman and Berger (2001) found that the objective Bayesian approach was the best-performing method, and recommended using the $\beta(\frac{1}{2}, \frac{1}{2})$ prior distribution, known as the Jeffreys prior.

In order to calculate the posterior probability beta distribution, Mossman (2000b) described the following method, using a commonly available spreadsheet program:

(a) Beta distributions are calculated for the base rate or prior probability, sensitivity, and specificity;

(b) A random value is taken from each of the three distributions above and combined in Bayes' Theorem;

(c) The process is repeated a large number of times (such as 2,000 or 10,000).

The distribution of these posterior probabilities is also a beta distribution. Confidence intervals for posterior probability values are found by arranging the 2,000 or 10,000 values in ascending order. In the example given above (where the individual scored 5 on the RRASOR), the 95% confidence intervals are from .46 to .76, indicating a high likelihood of recidivism even at the lower end of the distribution. For a score of 0, the corresponding confidence intervals are from .04 to .11, indicating a low likelihood or recidivism.

A Bayesian approach to risk assessment also lends itself to specific risk assessment questions. Because the objective Bayesian approach allows the calculation of accurate confidence intervals for post-test probabilities where there are small samples (Mossman & Berger, 2001), risk assessment instruments could be developed for sexual offenders in specific groups, such as offenders who abuse victims within their own families only compared to offenders who also abuse victims outside the family. The current research, which examines

[10] See Mossman (2000b; 2003) for full discussion of these approaches.

the feasibility of developing risk instruments for specific situations, also considers the application of such specific instruments within a Bayesian approach to risk assessment.

Research Aims

This research aims to demonstrate an approach to the assessment of specific risk questions for child sexual offenders using Bayes' Theorem. The specific risk questions identified here for demonstration purposes are the risk of an offender with a known victim of a particular gender, or relationship to the offender, victimising another child of another gender or of a different relationship. Given the absence of recidivism data for the population being studied, a *risk classification* approach will be used as opposed to a recidivism prediction approach. Thus, the initial aim is develop a classification measure for specific sub-groups of child sexual offender. This approach should ensure adequate base rates of the criterion groups (offenders across multiple victim categories) in order to investigate the approach of specific risk assessment. The primary aim of the research is, however, to demonstrate the potential use of these specific risk classification instruments within a framework of individual risk assessment, based on advances in the application of Bayesian conditional probability to forensic questions. Advances in Bayesian statistics are suited to making precise statements about the degree of uncertainty around individual probabilities, in the face of research based on small samples.

In South Australia, as in other jurisdictions, the data required to complete this type of project are available, but embedded within clinical notes and reports prepared as part of the normal clinical operations of the state-wide community treatment unit[11]. The first task will be to extract data from clinical files into a database containing the details of both offenders and their offences. The second task is to use this data to examine any differences between different groups of offenders based on their known victims. Three specific questions will be investigated:

1. What are the differences between those offenders who offend against single victims or against multiple victims?
2. What are the differences between those offenders who offend against male children, female children, or children of both genders?
3. What are the differences between those who offend within their families, outside of their families, or both inside and outside their families?

It is possible to answer these questions using a design commonly employed in the development of actuarial risk assessment tools. This involves identifying which variables discriminate between the groups, and then developing a composite scale based on the most discriminating variables. An important difference between this study and previous prediction studies is that there is no prospective follow-up of offenders following initial contact with a service. Thus, this approach will not allow for the development of a scale that can be used to predict future behaviour, but will simply allow for the identification of potentially relevant variables based on past behaviour. An additional aim of this research is to examine the extent to which the variables identified using this process overlap with those identified in prediction studies with other populations used to develop actuarial tools.

The final aim of the research is to demonstrate the use of specific risk classification scales within a Bayesian framework to answer specific risk questions. This will demonstrate the probability that an offender with one type of offence history belongs to a group of offenders who cross-offending types, along with corresponding confidence intervals. This approach will potentially be of use in formulating answers to specific risk questions.

[11] No correctional sexual offender treatment program has ever been delivered in South Australia.

Method

Description of Agency: The South Australian Sexual Offender Treatment & Assessment Program (SOTAP)

Glenside Campus Mental Health Services in South Australia deliver an assessment and treatment service to offenders who commit sexual offences against children (the Sex Offender Treatment and Assessment Program, SOTAP). SOTAP is a community based treatment service for adults who offend sexually against children and adolescents, including those who offend by distributing or accessing child pornography. SOTAP also provides a treatment service for other paraphilias, including exhibitionists, voyeurs and sexual fetishists. In addition, the unit provides an information group for partners, family members and support people which addresses child sexual offending, treatment at SOTAP and information about risks of re-offending and child protection strategies. The majority of referrals to the program are derived from the Adelaide metropolitan area, with the remainder coming from rural areas of South Australia. Direct services are provided in some country areas. The program provides services for both mandated clients (who may attend in line with parole conditions or at the discretion of their supervising officer) and voluntary clients. Voluntary clients are defined as those with no legal compulsion to attend. Voluntary clients may be referred to SOTAP through Family and Youth Services, police, community health centres, or by self-referral.

Since the program began in 1990, records on over 1,000 offenders have been compiled. This represents one of the largest samples of known child sexual offenders within Australia.

Coding Guidelines

The first aim of this project was to develop the offender database. This involved, first compiling a list of variables of interest and second, manually searching through clinical case notes and entering relevant information into the database. A list of variables to code was formulated prior to data entry and targeted factors previously shown or hypothesised as related to child sex offending as well as comprehensive demographic information. These included offender demographics at time of assessment and at the time of the offence(s), offending history variables (for example, prior sexual and non-sexual offending, frequency, duration, and convictions/charges as well as victim-specific details such as gender and relationship to offender), developmental variables (for example, sexual abuse as a child,

physical abuse, and foster experiences), and mental and behavioural variables (for example, psychopathology, presence of paraphilias, and substance use). Guidelines of the coding procedure and a full list of variables included can be found in Appendix 1.

Variables were coded from client assessment reports, as well as from supplementary information (for example, sentencing remarks or other professional reports). Clients were excluded from data entry if their case file contained no SOTAP assessment report or if such a report were insufficient in supplying basic victim or offender information. Clients of the SOTAP service who were attending for the Sex Offender Information Group (offered to partners and family of offenders seeking information and support) were not included in the database; nor were clients who did not have a child-related offending history (for example, adult-targeted rapists or exhibitionists).

Details of sexual and non-sexual offending were coded according to the main categories used by police for legally charging an individual in South Australia (see Criminal Law Consolidation Act, 1935). Sexual offending was, therefore, separated into rape, indecent assault, unlawful sexual intercourse, indecent exposure/behaviour, and other (the latter category included such acts as gross indecency and prurient interest). Similarly, non-sexual offending was coded in terms of violent, property-related, and drug-related crime. A victim was counted if there was a conviction, charge, or allegation supported by substantial details. This inclusive criterion for counting victims was adopted because of underestimation of sexual offending in official records of charges and convictions (Heil et al., 2003). Variables relating to paraphilias and substance dependence were only coded if a professional diagnosis had been made indicating these were present, as opposed to vague reference to isolated behaviour (see American Psychiatric Association, 1994; DSM-IV classification for diagnosis). Psychopathology was coded as present only if a DSM-IV Axis I diagnosis of major mental disorder had been made by SOTAP clinicians or other professionals within five years prior to assessment.

Data were collected in two stages, dictated by funding availability: a four-month period in 2002 followed by a 10-month period in 2003. The client files were held at SOTAP and were coded at the service premises. In order to maximise confidentiality and consistency, one researcher entered data from the clinical files.

Participants

By the end of the coding period, a total of 1,162 clients had attended SOTAP since the program began. Due to the nature of this research, offenders with no victim information (i.e., those referred because of internet pornography offences) were excluded from the current analysis. Female clients were also excluded as they only represented a tiny fraction of the total sample (N= 8). Cases were identified on the basis of information concerning the first victim. Offences against the earliest known victim are known as index offences. Subsequent analysis was confined to those cases in which the index offence resulted in referral to the service prior to 2002. This selection aimed at giving all cases some opportunity to re-offend, two years being chosen as a modest time frame for this purpose. A total sample size of 324 (27.9% of all files) resulted, 36 of whom were current clients and 288 were clients who had attended the service previously (these clients had often completed treatment, been incarcerated, or parole conditions requiring treatment had expired). Therefore, 72.1 % of files were excluded from data entry because of insufficient information, lack of child sexual offending, or status as partner or family of offender.

The mean age of the sample at the time of index offence was 42.4 years (SD= 12.5). Regarding attendance status, Two hundred and twenty-six clients (69.8%) were mandated to attend the service due to parole or bond conditions, while 98 clients (30.2%) were attending voluntarily often prior to charges or convictions being laid or following completion of a parole mandate. Offenders with more than one victim comprised 36.4% (N= 118) of the sample. As shown in Table 1, clients had allegations for offences at a greater frequency than charges and, similarly, more charges than convictions for offence categories ('allegation' frequency includes the sum total of convictions, charges and alleged offences).

Two hundred and thirty-two offenders (72.2%) in the sample had female victims only, 19.1% (N= 62) had only male victims and 7.4% (N= 24) had both male and female victims. Of the total sample, 48.5% of offenders (N= 157) had familial victims only, 42.0% (N= 136) had only non-familial victims and 8.6% (N= 28) had victims in both relationship categories.

Table 1. Frequencies for conviction, charge and allegation categories

Offence type	N	Percentage
Convictions		
Rape/Attempted Rape convictions	18	5.6
Indecent Assault convictions	139	42.9
Unlawful Sexual Intercourse/ Attempted U.S.I. convictions	105	32.4
Indecent Exposure/Behaviour convictions	7	2.2
Other convictions	45	13.9
Charges		
Rape/Attempted Rape charges	46	14.2
Indecent Assault charges	162	50.0
Unlawful Sexual Intercourse/ Attempted U.S.I. charges	121	37.3
Indecent Exposure/Behaviour charges	6	1.9
Other charges	51	15.7
Allegations		
Rape/Attempted Rape allegations	52	16.0
Indecent Assault allegations	217	67.0
Unlawful Sexual Intercourse/ Attempted U.S.I. allegations	153	47.2
Indecent Exposure/Behaviour allegations	14	4.3
Other allegations	67	20.7

Procedure

The procedure for developing risk classification scales for specific risk questions was conducted in a staged approach. In the construction of all risk classification scales, 28 categorical variables were initially chosen from the total list. The basis for selection was categorical variables previously investigated in risk assessment research (see Beech & Ward, in press), including developmental risk factors (e.g., victim of child abuse), sexual self-regulation (e.g., prior sex offences), interpersonal relationships (e.g., lack of long-term relationships), general self-management/impulsivity (e.g., prior non-sexual offences), and triggers (e.g., substance abuse). Two variables were created regarding the age of offender at time of first offence. One was based on the STATIC-99 cut-off of 25 or younger (Hanson & Thornton, 1999). In addition, a second age of offender variable was dichotomised into 32 years of age or younger, versus 33 years of age or older, based on maximal sensitivity and specificity with our sample.

In order to model the assessment of specific risk questions, five risk classification scales were constructed to address discrimination of dichotomous groups. First, a scale was constructed to discriminate offenders with one recorded victim from offenders with multiple victims of any type. Second, two scales were constructed to assess offending across gender categories. Offenders against female victims only were compared with offenders who had victims of both genders. The second comparison was of offenders against male victims only with offenders who had victims of both genders. Finally, two scales were constructed to assess offending across relationship boundaries. Offenders against familial victims only were compared with offenders who had intra-familial and extra-familial victims. The second comparison was of offenders against extra-familial victims only with offenders who had intra-familial and extra-familial victims.

For each dichotomous comparison of groups, the initial pool of 28 variables was subjected to correlational analyses. The variable was selected for second round analysis if r or Phi exceeded 0.1. The categorical variables were then analysed for adequacy of expected frequencies. Variables with expected frequencies in cells of less than one were discarded. Variables with a large number of cases in the 'not known' category were also discarded. Correlations between selected variables were also carried out. For each pair of variables with high inter-correlation (> .5), the variable with a stronger relationship with the target variable was usually selected. In cases where there was little or no difference between the two related variables, the variable was chosen for ease of scoring or because it contained more information.

Predictive Accuracy

Predictive accuracy of risk instruments may be measured by indices such as fraction of correct predictions, relative improvement over chance (RIOC), and sensitivity and specificity. However, there are problems in comparing the predictive accuracy of tests, or in comparing the accuracy of a test across different studies, using these measures. The measures of fraction of correct predictions and RIOC are affected by the base rates of the phenomena to be predicted, as well as decisions to avoid certain kinds of prediction error (Mossman, 1994), thus obscuring intrinsic predictive accuracy. The test properties of sensitivity and specificity, as well as correlation of predictor and criterion, are also affected by base rates (Rice & Harris, 1995). The most suitable method of comparing the predictive accuracy of tests is by Receiver Operating Characteristic (ROC) analysis. The *area under the ROC curve* (AUC) is a useful

index of predictive accuracy, as it is not affected by variation in base rates (Quinsey et al., 1998; Rice & Harris, 1995).

The interpretation of AUC is the likelihood that an individual with the characteristic of interest, drawn at random, will have a higher test score than a randomly chosen individual without the characteristic of interest (Hanley & McNeil, 1982). Values of the AUC vary from 0 to 1. An AUC value of 0.5 indicates random predictive accuracy, and 1.0 indicates perfect predictive accuracy. Therefore, a meaningful AUC is above 0.5.

In the present research, predictive accuracy of the risk classification scales was assessed using Pearson correlations and AUC. In addition, the specific scales relating to crossing gender and relationship types were subjected to secondary tests of predictive accuracy. Correlations and AUC values were obtained for the scales with and without offenders against single victims included. If the AUC of the scale remained significant when only multiple-victim offenders were included, it was likely that the classification ability of the scale was not accounted for by differences between single-victim and multiple-victim offenders.

Demonstration of Bayesian Risk Classification

Risk classification for hypothetical individuals were demonstrated using specific risk classification scales. Bayes' Theorem was calculated for a specified base rate and specified scale score. Confidence intervals were calculated using Beta distributions for the base rate, sensitivity (true positive rate), and specificity (true negative rate). From these distributions, 95% confidence intervals were calculated, using a spreadsheet program. Random values were taken from the three distributions above and combined in Bayes' Theorem. The process was repeated 10,000 times. The distribution of these 10,000 results was used to obtain confidence intervals for the posterior probability relating to the specific risk assessment question.

Results

Correlation coefficients were calculated for the association between each variable and the classification of offenders by each of several victim characteristics in turn. On the basis of these coefficients, variables were selected for inclusion in a scale for the prediction of offending against multiple victims, and the association between the resultant scale scores and the classification of offenders by multiple victim status calculated. The basis of selection was a Phi coefficient of >.10, and adequate data availability: a low incidence of missing information and adequate cell sizes in cross-tabulation with the dependent variable. This process was subsequently repeated for each of several ways of classifying victim characteristics, with groupings based on victim gender, and victim-offender relationship. In each case, classification-specific scales were identified, and their associations with the classification in question calculated. These data subsequently provided the basis for trial calculations of Bayesian conditional probabilities.

Multiple Victims Typology

Cases were classified according to whether they had a single victim or multiple victims. As missing data was encountered for some variables, the resulting multiple victim risk scale yielded a sample size of 285, of which 181 had known single victims and 104 known multiple victims. Of the total list of potential predictor variables, six were identified as suitable for inclusion in the predictive scale[12]. These variables were sexual abuse experience in childhood, length of relationship exceeding 24 months (no relationship exceeding 24 months more common in multiple offenders), age of offender less than 25 at time of first offence, any stranger victims, any unrelated victims, and any male victims. Variables and Phi coefficients are listed in Table 2.

Table 2 Phi coefficient levels for discriminating variables for multiple versus single offenders

Variables	Phi
Sexual abuse experience in childhood	.22
Length of relationship exceeding 24 months	.13
Age of offender < 25 at time of offence	.25
Any stranger victims	.19
Any unrelated victims	.27
Any male victims	.26

Responses to these items were summed to yield a score from 0 – 6 for each offender. The point-biserial correlation between scale score and the classification of offenders as single-victim or multiple-victim offenders was $r = .40$, $p < .01$. Prediction using ROC showed area under the curve (AUC) = .73, $p < .01$, (95% confidence interval [CI] = .67 – .79).

Table 3 Proportions of multiple versus single offenders for multiple offender risk scores

Score	Single offenders	Multiple offenders	Proportion of multiple offenders
0	61	10	.14
1	65	24	.27
2	29	25	.46
3	19	27	.59
4	5	10	.67
5	2	6	.75
6	0	2	1.00
Total	181	104	

Example Bayesian Calculation Using Multiple Offender Risk Scale

In order to demonstrate the use of the multiple offender risk scale with an individual, using Bayes' Theorem and confidence intervals for the individual's probability of being a multiple offender, three pieces of information are needed: the base rate of multiple offenders in a sample, the sensitivity of a particular score on the risk scale, and the false positive rate for that score. In the present study, the base rate of multiple offenders is 104/285 or .36. For the

[12] The following variables met the criterion of Phi > .10, but were discarded on the basis of insufficient data: Child-related fantasy preceding offending.

purposes of an example calculation, suppose that the individual sexual offender in question comes from a sample of 200 sexual offenders, of whom .30 or 60 individuals would be multiple offenders. With reference to Table 3, the individual receives a score of 1 on the multiple offender risk scale, a relatively low score. The sensitivity of that score on the multiple offender risk scale is 24/104 or .23. The false positive rate of the score is 65/181 or .36. Using Mossman's program for calculating Bayesian confidence intervals the probability that the individual belongs to the group of multiple offenders is .21, with 95% confidence intervals of .14 to .31.

Gender of Victim Typology

The focus of analyses by gender of victim was on the probability of cross-gender offending for offenders known to have victims of one gender. For this purpose, cases were initially classified according to whether they involved only female victims, only male victims, or both-gender (cross-gender) victims. The comparisons with cross-gender offenders were conducted separately for female-victim-only offenders and male-victim-only offenders.

Female victims

The first analysis involved cases with only female victims and victims of both genders. Because of missing data for some variables, the resulting risk scale yielded a sample size of 233, of which 20 had known victims of both genders, and 213 had only female victims. Five variables – sexual abuse experience in childhood, length of adult relationship exceeding 24 months (no relationship exceeding 24 months more common in offenders with victims of both genders), marital status preceding offending (being single or separated at time of offence), any unrelated victims, and age 32 or less at time of offence – met the criteria for inclusion in a scale to predict the female victim cross-gender distinction[13]. The variables and Phi coefficients are listed in Table 4.

[13] The following variables met the criterion of Phi > .10, but were discarded on the basis of insufficient data: Use of child pornography, child pornography offences, presence of grooming preceding offending.

Table 4 Phi levels for discriminating variables with female-victim versus both-gender offenders

Variables	Phi
Sexual abuse experience in childhood	.17
Length of relationship exceeding 24 months	.12
Age of offender < 33 at time of offence	.18
Marital status preceding offending	-.13
Any unrelated victims	.12

Responses to these items were summed to yield a score from 0 – 5 for each offender. The item marital status preceding offending was reversed. The correlation between scale scores and the variable differentiating between female-only-victim offenders and cross-gender-victim offenders was r = .23, p. < .01; ROC area under the curve = .72, p. < .01; (95% CI = .61 -.83). Given that the comparison of female-victims-only offenders with cross-gender offenders confounds single-gender offending with single-victim offending, ROC analysis of the scale was repeated using multiple offenders only (n = 81). The results were very similar for the correlation between scale scores and gender typology, r = .22, p. < .01. However, the ROC area under the curve was considerably lower using multiple offenders only, AUC = .63, p. > .05, (95% CI = .50 - .78). This result suggests that the scale adds little incremental predictive accuracy beyond the comparison of single and multiple offenders. Put another way, using the multiple offender risk scale in this sample may be as accurate as the specialized scale described above for classifying both-gender rather than female-victim-only offending.

Male victims

Cases were next selected on the basis of having only male victims or victims of both genders. Because of missing data for some variables, the resulting risk scale yielded a sample size of 82, of which 22 had known victims of both genders, and 60 had only male victims. Seven variables met the criteria for inclusion in a scale: history of adult relationships (relationships recoded), previous non-sexual offending, use of adult pornography, any unrelated victims (reversed), any stranger victims (reversed), employment status (unemployed), and age less than 25 at time of offence[14]. The variables and Phi coefficients are listed in Table 5.

[14] The following variables met the criterion of Phi > .10, but were discarded on the basis of insufficient data: Use of child pornography, presence of child-related fantasy preceding

Table 5 Phi levels for discriminating variables with male-victim versus cross-gender offenders

Variables	Phi
History of adult relationships	.24
Previous non-sexual offending	.13
Use of adult pornography	.14
Age of offender < 25 at time of offence	.21
Employment status preceding offending	.12
Any unrelated victims	-.12
Any stranger victims	-.16

Responses to these items were summed to yield a score from 0 – 7 for each offender. The items relating to unrelated victims and stranger victims were reversed. The correlation between the formed scale and gender typology was $r = .36$, $p < .01$; ROC area under the curve = .73, $p < .01$, (95% CI = .60 -.86). Given that the comparison of male-victims-only offenders with cross-gender offenders confounds single-gender offending with single-victim offending, ROC analysis of the scale was repeated using multiple offenders only. When analyses were conducted with multiple offenders only (N= 46), the correlation between scale score and gender typology was greater: $r = .37$, $p. < .01$. ROC area under the curve was similar, AUC = .71, $p < .05$, (95% CI = .55 - .86).

Table 6 Proportions of cross-gender versus male victim only offenders for cross-gender offending risk scores

Score	Male victim only offenders	Cross-gender offenders	Proportion of cross-gender offenders
0-1	5	0	.00
2-3	29	5	.15
4-5	25	13	.34
6-7	1	4	.80
Total	60	22	

offending, presence of planning preceding offending, presence of grooming preceding

Example Bayesian Calculation Using Male-only versus Cross-gender Risk Scale

In the present study, the base rate of cross-gender offenders among those with male victims is 22/82 = .27. For the purposes of an example calculation, suppose that the individual sexual offender in question comes from a sample of 80 sexual offenders with known male victims, of whom .20 or 16 individuals would also have female victims. With reference to Table 6, the individual receives a score of 4 on the specialized risk scale, a relatively high score. The sensitivity of that score on the risk scale = 13/22 or .59. The false positive rate of the score = 25/60 or .42. Using Mossman's program for calculating Bayesian confidence intervals, the probability is that the individual belongs to the group of offenders with male and female victims is .26, with 95% confidence intervals of .14 to .41.

Relationship to Victim Typology

Cases were initially classified according to whether they involved only familial victims, only non-familial victims, or both familial and non-familial victims (cross-relationship offenders). The comparisons with cross-relationship offenders were conducted separately for familial-only offenders and non-familial-only offenders.

Intra-familial Victims only versus Cross-relationship Offenders

The first analysis involved cases with either cross-relationship victims or intra-familial-only victims. Because of missing data for some variables, the resulting risk scale yielded a sample size of 176, of which 26 had known victims of both types of relationship, and 150 had only intra-familial victims. Eight variables met the criteria for inclusion in a scale: sexual abuse experience in childhood, foster experience in childhood, presence of paraphilias, property-related convictions, substance use, any male victims, marital status preceding offending, and age less than 25 at time of offence[15]. The variables and Phi coefficients are listed in Table 7.

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offending.

Table 7 Phi levels for discriminating variables with intra-familial victims versus cross-relationship offenders

Target variables	Phi
Sexual abuse experience in childhood	.20
Foster experience in childhood	.13
Age of offender < 25 at time of offence	.29
Previous property-related convictions	.20
Presence of paraphilias	.11
Marital status preceding offending	-.18
Substance use	.10
Any male victims	.24

Responses to these items were summed to yield a score from 0 – 8 for each offender. The item relating to marital status preceding offending was reversed. The correlation between scores on the scale and relationship typology was r = .37, p. < .01; ROC area under the curve = .75, p. < .01; (95% CI = .63 -.86). When analyses were conducted with multiple offenders only (n = 70), a weaker association was found: r = .31, p. < .01; ROC area under the curve = .67, p. < .05, (95% CI = .53- .82).

Table 8 Proportions of cross-relationship versus familial-victim-only offenders for cross-relationship offending risk scores

Score	Intra-familial offenders	Cross-relationship offenders	Proportion of cross-relationship offenders
0-1	86	5	.05
2-3	51	10	.16
4-5	13	8	.38
6+	0	3	1.00
Total	150	26	

[15] The following variables met the criterion of Phi > .10, but were discarded on the basis of insufficient data: Any stranger victims, presence of child-related fantasy preceding offending, psychopathology summary.

Example Bayesian Calculation Using Familial versus Cross-relationship Risk Scale

In the present study, the base rate of cross-relationship offenders among those with familial victims is 26/176 = .15. For the purposes of an example calculation, suppose that the individual sexual offender in question comes from a sample of 150 sexual offenders with known familial victims, of whom .20 or 30 individuals would also have non-familial victims. With reference to Table 8, the individual receives a score of 1 on the specialized risk scale, a low score. The sensitivity of that score on the risk scale = 5/26 or .19. The false positive rate of the score = 86/150 or .57. Using Mossman's program for calculating Bayesian confidence intervals, the probability that the individual belongs to the group of offenders with familial and non-familial victims is .08, with 95% confidence intervals of .03 to .16.

Extra-familial Victims only versus Cross-relationship Offenders

Cases were next selected on the basis of having only non-familial victims or cross-relationship victims. Because of missing data for some variables, the resulting risk scale yielded a sample size of 144, of which 24 had known victims of both types of relationship, and 120 had only extra-familial victims. Ten variables met the criteria for scale inclusion: physical abuse experience in childhood, sexual abuse experience in childhood, any previous non-sexual offending, previous drug-related convictions, presence of paraphilias, any female victims, length of adult relationship exceeding 24 months, employment status preceding offending (unemployed), marital status preceding offending (single/separated), and age less than 25 at time of offence[16]. The variables and Phi coefficients are listed in Table 9.

[16] The following variables met the criterion of Phi > .10, but were discarded on the basis of insufficient data: Presence of child-related fantasy preceding offending, presence of grooming preceding offending, psychopathology summary.

Table 9 Phi levels for discriminating variables with extra-familial victims versus cross-relationship offenders

Variables	Phi
Sexual abuse experience in childhood	.21
Physical abuse in childhood	.18
Age of offender < 25 at time of offence	.10
Previous non-sexual offending	.13
Presence of paraphilias	.11
Marital status preceding offending	.15
Employment status preceding offending	.12
Any female victims	.20
Previous drug-related convictions	-.10
Length of relationship exceeding 24 months	-.17

Responses to these items were summed to yield a score from 0 – 10 for each offender. The items relating to length of relationship and previous drug-related convictions were reversed. The correlation between relationship typology and scale score was r = .43, p. < .01; ROC area under the curve = .82, p. < .01, (95% CI = .74 - .90). When analyses were limited to multiple offenders (n = 59), generally similar associations resulted: r = .50, p. < .01; ROC area under the curve = .81, p. < .01, (95% CI = .70 - .91).

Table 10 Proportions of cross-relationship versus non-familial victim-only offenders for cross-relationship offending risk scores

Score	Extra-familial offenders	Cross-relationship offenders	Proportion of cross-relationship offenders
0-2	10	0	.00
3-4	43	1	.02
5-6	55	12	.18
7-9	12	11	.48
Total	120	24	

Example Bayesian Calculation Using Extra-familial versus Cross-relationship Risk Scale

In the present study, the base rate of cross-relationship offenders among those with non-familial victims is 24/144 = .17. For the purposes of an example calculation, suppose that the individual sexual offender in question comes from a sample of 150 sexual offenders with known non-familial victims, of whom .15 or 23 individuals would also have familial victims. With reference to Table 10, the individual receives a score of 8 on the specialized risk scale, a high score. The sensitivity of that score on the risk scale = 11/24 or .46. The false positive rate of the score = 12/120 or .10. Using Mossman's program for calculating Bayesian confidence intervals, the probability that the individual belongs to the group of offenders with familial and non-familial victims is .45, with 95% confidence intervals of .26 to .65.

Discussion

The level of risk ascribed to an individual child sex offender can have far-reaching effects on his (or her) subsequent management. In recent years the development of a number of actuarial risk assessment measures has enabled assessors to make empirically defensible statements about the probability of a person convicted of child sexual offences re-offending over a fixed time period. While this is a significant development, work still needs to be done to improve the predictive quality of these measures.

Although actuarial approaches to risk assessment are generally considered to be more reliable than clinical risk assessments, they only offer a global estimate of risk of re-offending, and thus provide little guidance when more specific questions are asked. For example, the allocation of a risk category such as 'medium risk', as defined by existing risk assessment measures, tells us relatively little about the risk of a perpetrator of one type of offence committing another type of offence. This problem is illustrated by comparison of the predictive accuracy for different types of offences in a Swedish sample of sexual offenders, using the RRASOR and Static-99 (Sjöstedt & Grann, 2002). Predictive accuracy was moderate for offences against stranger victims, but low for offences against family or related victims.

In addition, the practice of adjusting the findings of actuarial risk assessments on the basis of a clinical assessment has the potential to increase the unreliability of any assessment, as there is no consistent empirical evidence to suggest how clinical adjustments might be made, and on what basis. Clinical adjustments are made to actuarial assessments because the risk factors covered by actuarial instruments are considered to omit individually relevant risk factors, or the actuarial instruments do not reflect changes in individuals, so-called dynamic risk factors.

Given that a significant minority of known child sexual offenders will go on to commit further sexual offences (Hanson & Bussiere, 1998), it is important that assessments are able to provide guidance about specific risk questions. Such guidance will be critical to developing risk management strategies that are appropriate both to the individual offenders and to the community.

In this project, existing data from clinical files maintained by a community based sexual offender assessment and treatment program were coded into a research database. Over 350 clinical files were coded into a research database containing over 140 variables. The data

were then analysed to determine whether it was possible to provide answers to specific risk assessment questions. The clinical files contained detailed information about the victims of child sexual offences. This information was used to classify offenders into two groups in the following ways – those with known single victims versus known multiple victims; those with known male victims versus known male and female victims; those with known female victims versus known male and female victims; those with known familial victims versus known familial and non-familial victims, and those with known non-familial versus known familial and non-familial victims. Although recidivism data were not available, it is questionable whether recidivism data would have been of great assistance for specific risk assessment questions. Very small base rates of specific offending (from 0.2% to 3%) were obtained by Sjöstedt and Grann (2002), even though their initial sample numbered more than 1,200. In contrast, base rates of offenders who had crossed particular victim boundaries in the present study ranged from 15% to 36%.

Single- vs multiple-victim offenders

Analysis revealed that six variables potentially discriminated those offenders with known single victims from those with known multiple victims. These were self-reported sexual abuse in childhood, relationship with an adult of over 2 years, a male victim, stranger victim, age of offender at time of offence, and an unrelated victim. These variables were combined to form a brief scale, scores on which were related reasonably well to multiple offending ($r = .40$, ROC area under the curve (AUC) = .73). In other words, scores on the scale could classify offenders who had multiple offences with reasonable accuracy. Given that the scale was developed retrospectively (based on historical case-file data), it should not be considered as an actuarial risk assessment measure (i.e., one that predicts future behaviour). However, it was noticeable that of the variables identified, five of the six are found in actuarial risk measures commonly used to predict sexual re-offending in other populations[17] (see Beech & Ward, in press). This suggests that the scale has some value in differentiating between offenders who are known to have committed single offences from those who are known to have re-offended, rather than being limited to differentiating between single and multiple victims. In other words, the scale may act as a proxy for risk of recidivism.

[17] Some static risk factors identified in actuarial measures (such as number of previous offences) were not considered in the development of this scale in order to avoid confounding predictors with the outcome measure of multiple offending.

Table 11 Comparison of variables discriminating between single and multiple offenders with actuarial risk assessment tools.

	Actuarial measure			
	Static-99	SORAG	MnSOST-R	RRASOR
Risk Variable				
1. Self-reported sexual abuse in childhood	No	No	No	No
2. Relationship with an adult of less than 2 years	Yes (lack of long-term intimate relationship)	Yes (never married)	No	No
3. Male victim	Yes	Yes	No	Yes
4. Stranger victim	Yes	No	Yes	No
5. Under 25 at time of offence	Yes	Yes (age under 26)	No	Yes
6. Unrelated victim	Yes	No	No	Yes

Of the six items identified as important variables in classifying single versus multiple victim offenders, five have been identified in previously published actuarial measures of risk of sexual re-offending (see Table 11 above). The variable relating to self-reported childhood sexual abuse was the exception here. In this data set, a self-reported history of childhood sexual abuse (as recorded in clinical files) increased the chances of a known child sexual offender having committed offended against multiple victims. This finding contrasts with the findings of Hanson and Bussiere (1998) who, in their meta-analysis of sex offender outcome studies, did not find a relationship between sexual abuse and re-offending. Theoretically, however, childhood sexual abuse is often regarded as important in the aetiology of sexual offending, and its inclusion as a discriminating variable is not surprising. Marshall and Barbaree (1990) proposed a developmental model highlighting the role of disruptive and abusive childhood experiences in producing a severe lack of confidence in young males and failure to equip them with the skills necessary to develop high quality relationships with other adults. This includes a failure to appreciate the distress of others (i.e., a lack of empathy) and an inability to form affectionate bonds with other people (i.e., a lack of intimacy skills with the consequent experience of loneliness). Marshall and Barbaree (1990) argue that these vulnerability factors reduce the chances of young men meeting their needs in pro-social ways, increasing the appeal of those ideas that emphasise male privilege and the use of coercive tactics. Ward and Siegert (2002) suggest that some offenders may have become prematurely sexualised as a consequence of sexual abuse and seek to achieve intimacy through sexual contact.

Following their recent review of developmental factors in sexual offending, Starzyk and Marshall (2003) have called for the need for prospective and longitudinal studies to demonstrate the relationship between childhood events and experiences and sexual offending. They suggest that attachment theory provides a coherent framework from which to understand the impact of developmental factors on child sexual offenders, particularly given that poor quality attachment styles typify this group (Ward, McCormack & Hudson, 1997). This suggestion would appear sensible given the data presented here and other work suggesting that close parental ties are important in a number of general criminological theories, and are inversely related to delinquency (see Juby & Farrington, 2001).

The finding can also be accommodated within the preconditions theory (Finkelhor, 1984a; Malamuth, Heavey & Linz, 1993) and quadripartite theories (Hall & Hirschman, 1992) of sexual offending which suggest that in order for sexual aggression to occur, a number of aetiological factors must converge. These include motivation to commit the aggressive act, reductions in internal and external inhibitions (including cognitions justifying sexual aggression), and the opportunity to aggress. In these terms, experience of sexual abuse in childhood potentially disrupts the development of internal inhibitors that prevent offending. The Hall and Hirschman model also highlights the role of affective dyscontrol and how negative emotional states such as anger and hostility can play a role in reducing the normal inhibitors of sexual offending. Given the impact of childhood sexual victimisation on mental health (see above), it is possible to view childhood experiences of abuse as key aetiological factors in the development of offending.

Clearly, however, experience of childhood sexual abuse does not inevitably lead to offending. Ward and Siegert (2002) describe multiple pathways to a sexual offence, with each involving a "core set of dysfunctional psychological mechanisms" (Ward & Sorbello, 2003, p.14). Intimacy and social skill deficits, distorted sexual scripts, emotional dysregulation, and cognitive distortions are all mechanisms that are thought to be particularly important in sexual offending. Although each of these mechanisms will play a role in all sexual offences, Ward and Siegert (2002) suggest that particular pathways are characterised by particular mechanisms. For example, intimacy deficits may be particularly pertinent for those offenders who possess normal sexual scripts and only offend at specific times. This model therefore helps to explain the differential impact of childhood sexual abuse (see above) and how it may only increase the risk of sexual offending in adult life if other developmental factors are present.

Specific Risk Scales - Gender of Victim

A similar methodology to that used to develop the single vs multiple victim scale was followed to develop four separate scales that would be useful in answering specific risk questions, relating to victim gender and victim relationship. The resulting scales could have utility in answering specific risk assessment questions, including the differences between single gender and cross-gender offenders and single relationship and multiple relationship (intra-familial and extra-familial) offenders. These comparisons relate directly to the stability of victim choices amongst child sexual offenders, and are thus of value in helping to determine appropriate responses to specific risk questions.

Analysis revealed that seven variables discriminated those offenders with known male victims from those with known victims of both sexes. These were having a history of an adult relationship, previous non-sexual offending, use of adult pornography, related victims, not-stranger victims, being employed, and being under 25. All were positively related to crossing the gender-boundary (having both male and female victims). Scores on a scale based on these variables were related reasonably well to the classification of offenders (r= .36, AUC = .73).

Five variables discriminated those offenders with known female victims from those with known victims of both sexes. The relationship between the scale based on these variables and the classification of offenders was r= .23, AUC = .72. However, when single-victim offenders were excluded from the analysis, the correlation between the scale and classification of offenders was similar (r= .22), but the AUC decreased to.63, with a lower 95% confidence interval of .50, a statistically non-significant result. Because correlations are affected by base rates and AUC is not (Rice & Harris, 1995), AUC is a more useful indicator of predictive accuracy. Therefore, the scale for discriminating offenders with female victims from offenders with victims of both sexes was considered largely to be discriminating offenders with single versus multiple victims. Therefore, the multiple offender risk scale may be just as useful for discriminating the two groups of offenders with female victims. This finding may not be surprising given that the two scales shared three items: sexual abuse experience in childhood, length of relationship less than 24 months, and any unrelated victims. An age at first offence variable was also part of each scale, although the multiple offender scale contained a variable with the age cut-off of 25 years, from the Static-99, and the gender scale contained a variable with and age cut-off of 33 years.

In other words, it was possible to identify factors associated with the likelihood of an offender who is known to have offended against male victims also offending against female victims. It was not, however, possible to do this with those who had only offended against female victims. Thus, consideration of the risk factors that distinguish between single and multiple victim offenders is more appropriate in this instance.

Although not all research has linked victim gender to risk of recidivism[18], most empirical studies have shown that offenders with known male victims, or both-gender victims, have reported more victims and are at a higher risk of re-offending (Beckett, Beech, Fisher & Fordham, 1994; Furby, Weinrott & Blackshaw, 1989; Greenberg et al., 2000; Aylwin, Studer, Reddon, & Clelland, 2003). Hence the inclusion of male victims as a risk factor for recidivism in existing actuarial tools (see Table 11 above) is not surprising. Guay et al. (2001) in their study of 178 male sexual offenders in prison, found that those with male victims maintained a greater stability of victim choice (although this finding was less so for those who offended against adolescents). They noted, however, that for some offenders, preferences depended largely upon availability and opportunity.

The most common explanations for the apparent relationship between risk of re-offending and abuse against male victims implicate childhood sexual abuse as an important causal factor in subsequent sexual offending against boys. Studies by both Hanson and Slater (1988) and Worling (1995) found an association between childhood sexual abuse and offending against boys. Romano and DeLuca (1997) found that those offenders who, as children, were sexually abused by men, were more likely to commit offences against boys. More recently, Beech and Ward (in press) have suggested that abuse against boys may either represent a recapitulation of previous abusive experiences or confusion about sexuality and masculinity (see also Starzyk & Marshall, 2003). Aylwin et al. (2003), however, did not confirm these findings in their sample of adolescent sexual offenders. They found, to their surprise, that adolescents who offended against boys were least likely to have been both physically and sexually abused themselves. In this study, childhood sexual abuse did not emerge as a risk factor for cross-gender offending among those with male victims. In this sample, 48% of offenders who were known to have only male victims also reported a history of childhood sexual abuse, compared with 58% of those with both male and female victims. This may suggest that the experience of childhood sexual abuse may not lead to a

[18] Notably Abel et al. (1988) found that those who offended against girls reported more offences, and the MnSOST-R (see above) does not include male victim as a risk factor for further sexual offending. These differences are likely to be accounted for by differences in the ways samples were selected (Bickley & Beech, 2001).

recapitulation or re-enacting of their own abuse with male children, but rather to an increase of sexual offending against multiple victims, regardless of gender.

Four variables not in the multiple offender risk scale were included in the scale for discriminating offenders with male only versus male and female victims. Offenders with male and female victims were more likely to have a history of previous non-sexual offending, being unemployed, using adult pornography, and adult sexual relationships. Three of these variables are similar to items included in actuarial scales for sexual recidivism. Previous non-sexual offending is a risk factor in the SORAG. Hanson and Bussiere (1998) also found in their meta-analysis that prior non-sexual offending was correlated .13 with sexual recidivism. Poor employment history is an item included in the MnSOST-R and in the research-guided instrument, the SVR-20. Poor employment history is a similar item to the employment variable used in this study. Hanson's and Bussiere's review included employment instability, but its correlation with sexual recidivism was relatively low, at r= .07. Pornography use is a dynamic factor that is taken into account in scoring sexual preoccupation, an item included in the Sex Offender Need Assessment Rating (SONAR; Hanson & Harris, 2000), a relatively new instrument for measuring dynamic risk factors for sexual recidivism.

A history of adult relationships was more likely in offenders with male and female victims than in offenders with male victims only. This relationship is dissimilar to the situation for the multiple offending risk scale, where a lack of long-term relationship history was associated with multiple offending. Interestingly, the items of unrelated victims and stranger victims, included in the multiple offender risk scale, also discriminated offending across gender. However, the associations were in the reverse direction, so that offending against both genders was associated with related victims and non-stranger victims. This finding underlines the fact that risk factors operate within the context of the discriminations to be made. For example, schizophrenia is a factor negatively related to violent recidivism in the VRAG, an actuarial instrument for violence prediction (Harris, Rice, & Quinsey, 1993).

Specific Risk Scales - Relationship to Victim

The final set of analyses sought to identify variables that discriminated between those offenders with known single relationship victims (either familial or extra-familial) from those with cross-relationship boundary offence (both known familial and extra-familial victims). The analyses identified eight variables that discriminated offenders with familial-only victims from those with both familial and extra-familial victims. These were sexual abuse in childhood, foster experience in childhood, age of offender less than 25 at first offence,

previous property-related convictions, paraphilias, marital status (single/separated), substance use, and any male victims. Scores on the resultant scale were moderately associated with the classification of offenders (r= .37, AUC= .75).

Ten variables discriminated those offenders with known extra-familial victims from those with known familial and extra-familial victims. These were sexual abuse in childhood, physical abuse in childhood, age of offender less than 25 at first offence, previous non-sexual offending, paraphilias, marital status (married/defacto), being unemployed, any female victims, previous drug-related convictions (negatively related to cross-relationship offending), and length of relationship less than 24 months (negatively related to cross-relationship offending). Scores on the resultant scale were also moderately associated with the classification of offenders (r= .43, AUC= .82).

Studer et al., (2002) have argued that those who offend within their families (or incest offenders) have commonly been regarded as having only a small chance of re-offending. Firestone et al. (2000) reported that the sexual re-offending rate of their sample of 192 extra-familial offenders (followed up over a mean period of 7.8 years), was 15.1%. This was considerably higher than the re-offending rate of 6.4% for their sample of 251 intra-familial offenders. Greenberg et al. (2000) found that acquaintances (those with familiarity with the child but who were unrelated) had the highest sexual re-offence rate (16.2%)).

There are, however, identifiable differences between the characteristics of inter- and extra-familial offenders. For example, men who offend outside of their immediate family have been found to show greater sexual arousal to children (Marshall, 1997). Parton and Day (2000) compared a group of familial and non-familial child sex offenders on a number of relationship dimensions thought to be important in explaining offending. No statistically significant differences were found between the two groups on measures of general empathy, intimacy and loneliness, although non-familial offenders were found to have higher levels of cognitive empathy and a more internal locus of control than familial offenders. Smallbone and Wortley (2001) reported descriptive statistics detailing a sample of sexual offenders in a Queensland prison setting. Their findings suggested that, on average, intra-familial offenders offended over a shorter time-period than either extra-familial, or mixed-type (both intra- and extra-familial), offenders.

Some additional variables which had not been included in the multiple offender risk scale or the cross-gender risk scale were included in the two risk scales that discriminated offenders who crossed victim relationship boundaries from those whose victims were intra-

familial or extra-familial only. These variables have also been noted by other researchers. The presence of paraphilias was an item in both scales. Smallbone and Wortley (2001) also found that those offenders with intra-familial and extra-familial victims were more likely to have displayed exhibitionism or frotteurism. Hanson's and Bussiere's review included exhibitionism, which had a low correlation with sexual recidivism of r= .09.Two developmental variables were included in the scales. Foster experience in childhood discriminated offenders with intra-familial victims only from those offenders who also had extra-familial victims. Firestone et al. (2000) found that this variable was characteristic of recidivist extra-familial child molesters. Foster experience is a result of parental neglect, which has been proposed as a risk factor for adolescent and adult sexual offending (Starzyk & Marshall, 2003). In contrast to offenders with extra-familial victims only, offenders who crossed victim relationship boundaries were more likely to have been physically abused. Physical abuse was also found to be characteristic of recidivist extra-familial child molesters (Firestone et al., 2000). This variable was also noted by Starzyk and Marshall (2003) to be a risk factor for sexual offending.

The dynamic risk factor of substance abuse, which discriminated intra-familial only offenders from offenders who crossed victim relationship boundaries, was included in Hanson's and Bussiere's review. Its correlation with sexual recidivism was r= .09. Nevertheless, this item is included in risk instruments including the SORAG, MnSOST-R, SONAR, and SVR-20. Previous drug offences was included in the risk scale for discriminating extra-familial offenders from those who crossed victim relationship boundaries. It was characteristic of offenders with extra-familial victims only.

Marital status prior to the first offence appeared in both relationship risk scales, but showed relationships in opposite directions. In comparison to intra-familial offenders, those who crossed victim relationship boundaries were more likely to be single or separated. However, in comparison to offenders with extra-familial victims, this group were more likely to be married or in de facto relationships.

The risk factors identified here, in comparisons between offenders who committed their offences both within and outside of their families, overlap somewhat with those identified in the general offending risk assessment literature as related to risk of general recidivism (Andrews & Bonta, 1998). Risk factors such as substance abuse, sexual offending, marital status and employment status are all risk factors for previous non general recidivism. Although considerable caution is required in interpreting these findings, one interpretation is

that offenders who commit cross-boundary sexual offences display some similarities with non-sexual offenders. In other words, their offending may be understood as part of a pattern of general antisociality, rather than as sexually specific.

Support for Specific Risk Scales

Two sets of findings in this study provide some support for the notion of specific risk scales. First, scores on specific scales developed in the course of this study were reasonably accurate in their ability to predict group membership. Predictive accuracy was maintained when offenders with single victims were removed from analysis, for the two relationship to victim risk scales, and one of the gender of victim risk scales. This suggests that the scales were discriminating offenders who did or did not have victims of multiple types, and not just offenders who did or did not have multiple victims. Secondly, different variables emerged as discriminators for multiple offenders, offenders who crossed victim gender boundaries, and offenders who crossed victim relationship boundaries. This finding also lends support to the notion of specific risk scales.

It must be emphasised that undue reliance should not be placed on the particular variables included in the specific risk scales. Cross-validation of the items and scales on a sample apart from the development sample is important, but was not possible given the eventual number of useable files in the study. In addition, more confidence can be placed in particular risk factors if their relationship to the criterion variable, such as group membership or recidivism, can be understood theoretically. The association of some scale items with group membership in this study, such as marital status, may reflect access to certain types of victims rather than characteristics of offenders. For this reason, more work on theoretical integration of aetiology and risk factors like that of Beech and Ward (in press) is needed.

Incorporation of Risk Scales into Bayes' Theorem

With each of the risk scales described in the Results section, an example of the possible use of the scale in the risk assessment of an individual was given, in each case showing the incorporation of an individual score into Bayes' Theorem, with confidence intervals for the resulting posterior probability. There are three reasons that the use of specific risk scales in this way is desirable. First, Bayes' Theorem requires at least an estimate of the base rate of individuals in a particular group within a population of interest. If the base rate within the population of interest is the same or very close to that of the population on which

the scale was developed, then the probability of group membership will be close to that obtainable from the scale itself. Such probabilities are shown in the last column of each table of scores for the risk scales. However, should the base rate in the population of interest differ markedly from that of the scale development sample, then probabilities of group membership obtainable from the scale are likely to be inaccurate. This issue is pertinent for samples of sexual offenders, who seem to show considerable diversity (Polaschek, 2003).

Secondly, stronger statements about individuals can be made when Bayes' Theorem is used. Rather than stating that the average probability that individuals with a score of x belong to a particular group is y, it is possible to state that the probability is y that an individual belongs to a particular group, given the base rate of z and the individual's score of x. Such statements are arguably of much greater value to parole authorities, courts, and child protection agencies, all of whom must make decisions about individuals. Thirdly, because posterior probabilities from Bayes' Theorem give an impression of precision, it is highly desirable to also report confidence intervals for probabilities. Confidence intervals obtainable from repeated calculations using beta distributions (Mossman, 2000a,b) add additional accountability to risk assessment. If specific risk scales are based on large numbers of cases, then confidence intervals will be narrow. If the scales are based on small samples, confidence intervals will be wide. Confidence intervals around probabilities of group membership show clearly the level of precision in risk assessment. Unfortunately, confidence intervals for individual probabilities are not yet easily accessible to clinicians. Although the necessary computer software is widely available, the knowledge required to use the calculations is unfamiliar to most clinicians. Mossman (2003) expressed the hope that designers of tests will develop accessible software for clinicians to use for Bayesian calculations. If test designers take up his challenge, the use of Bayesian confidence intervals by clinicians may increase.

Finally, it should be noted that framing risk statements in terms of probability of group membership, as in this study, is different from making statements about probability of recidivism. The approach taken in this study may be regarded as a more conservative type of risk assessment. For example, a probability may be obtained that a person belongs to the group of offenders against intra-familial and extra-familial victims. Fewer than the total number of offenders in this group will commit further sexual offences. Therefore, a risk statement regarding group membership is more conservative than a statement about probability of future recidivism. However, given that risk prediction instruments are developed using official records as indicators of recidivism, and that official records underestimate sexual offending (Heil et al., 2003), then a more conservative approach to risk assessment may be more protective of children against future victimization.

Strengths and limitations

An important feature of this research is that all of the data were drawn from assessment information contained in clinical files maintained by a community treatment program. The data have been used in this research to predict group membership, rather than predict sexual re-offending. There are three main limitations of adopting this approach, which limit the extent to which the variables identified as predictors in this study may also be risk factors for recidivism.

The first limitation contains the content and quality of data encoded in the database. Offence history variables, which are known to be good predictors of recidivism, were discarded from some analyses on the basis of their potential to confound the results. For example, multiple offenders may have been charged at the same time with offences against more than one victim. Alternatively, individuals charged on more than one occasion with offences against single victims are also multiple-victim offenders. Therefore, a history of charges for sexual offending would indicate membership of the multiple offender group. Another example is that a history of male victims was associated with multiple offending. This variable was not suitable for the risk classification of cross-gender offending, as this variable was characteristic of all offenders in one of the analyses.

In addition, the variables in this study identified as important belong to a subset of those variables coded in the database. In this case, this only includes data that was frequently and easily obtainable from the clinical files. They may be other, potentially important, variables that were not recorded, most notably, relevant dynamic risk variables. Many of these are also likely to be important predictors. For example, Beech and Ward (in press), suggest that choice of victim is likely to be associated with deficits in sexual self-regulation. For Thornton (2002) and Hanson and Harris (2001), low levels of sexual self-regulation are characterised by sexual preoccupation and deviant sexual interests, using sex as a coping strategy. Theoretically, these arise out of an inability to manage mood states effectively, coupled with distorted sexual attitudes and/or an inability to utilise social supports, and at least some sexual offences occur following periods of rejection by adults, disappointment or extreme loneliness (Beech & Ward, in press). Previous research has also indicated that feelings of stress and anger have preceded deviant sexual fantasies and recidivism (Proulx et al., 1996; Hanson & Harris, 2000). While an attempt was made in this study to code emotional states in the hours and days prior to offending, there was insufficient coding of this sort of material (and indeed other dynamic risk factors) in the clinical files to use this information in any meaningful way.

The extent to which clinical files contained information of sufficient consistency and quality to be reliably coded into the database was a significant issue in this project. Of a total of 1,162 clinical files held by the service provider, only 324 (27.9%) were coded into the database. Many of the files that were not codable did not contain basic information about the offender and the offence that was required for inclusion in the database. This was a particular issue for files dating back before 1996 when no standardised report was produced following the assessment. There is no way to establish whether the exclusion of many of the older files significantly influenced the results of this study. The establishment of a research database has, however, required service providers to reflect further on information that should be regarded as central to any assessment of a child sex offender. As such the research process is likely to be of assistance in the development of more detailed and reliable clinical record keeping. Specifically, the impact of individual differences in assessment report writing cannot be underestimated. The reports regarded for this research contained a great variation with respect to details given and topics discussed, dependent on individual clinicians' styles. The sexual offender service would benefit from a standardised assessment format for clinicians to follow in both questioning clients and writing reports to ensure quality control of record keeping.

All of the data used in this study were coded by one researcher (as part of this project and an earlier project conducted in 2002). The researcher coded each file according to a defined coding manual (see Appendix 1) and coding of ambiguous data is likely to have been consistent for all files. An additional check, and a priority for future work in this area, would be to obtain independent ratings using the same coding manual, such that inter-rater reliability could be calculated.

The second limitation of this study concerns the definition of a victim used in this study. This is critical since the study is based on an assumption that data about the number and characteristics of victims is reasonably valid. In this study, an offender was coded as having a 'victim' not only following a conviction for an offence against a particular child, but also when charges were laid, or an allegation made. This decision was taken in the light of previous research which suggests that offenders have many more victims than those they are convicted of. Heil et al. (2003) reported that sixty three percent of their adult prison sample only known to have offended against male children, when interviewed following treatment and with polygraph testing, also disclosed offending against female children. Sixty four per cent who were only known to have offended against children who were relatives, subsequently also admitted offending against non-relatives. Studer et al. (2000) classified 328

patients who had completed the Phoenix treatment program into incest[19] and non-incest offenders on the basis of their index offence. Of the incestuous group, 88 (58.7%) reported other non-incestuous victims; 140 (78.7%) of the non-incestuous group reported other non-incestuous victims. Only 50 (33%) of the incestuous group had no other victims. An influential study by Abel et al. (1988) used the promise of confidentiality within their research design in an attempt to elicit true estimations of behaviour among incarcerated sexual offenders. Forty-nine percent of their sample reported that they had abused children outside of their family at the same time as they were abusing their children. Including allegations and charges as evidence of additional victims helps to overcome any problems associated with the under-reporting of additional victims at the time of entry into the program. In reality, however, it is impossible to ascertain the true number of victims that any sexual offender has abused.

The final limitation of the study concerns the lack of a standardised time period used for analysis following a first known victim. This limitation largely reflects the nature of the population and the source of the data, which support a focus on offending profiles rather than on recidivism specifically. The gap between a first victim and a second may have been days for some offenders and many years for others. Offenders whose first known offence occurred recently simply may have not had sufficient time to offend against other children. In this study such offenders are coded as single victim offenders. Most predictive recidivism studies follow known offenders up for a fixed period of time (typically five years) after a defined event (e.g., release from custody) and seek to analyse survival rates over that time period. In the present study, offenders' clinical records were tracked from the time of referral for an index offence, with the study restricted to cases that could be tracked for at least two years. The setting of a minimum period was intended to permit further instances of offending to come to light, whether by discovery or by disclosure (cf Heil et al., 2003). A stronger design would have identified multiple victims as only those who were known in a standardised time period (say ten years) following the date of the offence against the first known victim. However, given the recency of establishment of the program in South Australia, any attempt to do this would have substantially reduced the final sample size.

Although the lack of standardisation potentially confounds date of referral with opportunity for multiple offending, this was considered a defensible compromise in the interests of maximising sample size. The main reason for this is that there are no grounds for suspecting that date of referral is systematically related to any of the variables identified as

[19] They excluded non-biological fathers to ensure a 'pure' group of incest offenders.

predictors of multiple offending in the various classifications employed in this study. In other words, the lack of a standardised follow-up period is unlikely to have substantially biased the results obtained. It is opportunity to offend (or for offending to come to light) rather than time following an offence that is the relevant variable here. Many offenders who serve time in prison will not re-offend for many years, but this may well be related to the lack of opportunities to offend whilst in custody.

Limitations of the data notwithstanding, the value of the present research is as a demonstration project of the application of a Bayesian approach to data obtained from actuarial scales. The scales developed in the course of this study provide a locally meaningful basis for this application. For these scales to be used in any predictive capacity (i.e., for recidivism prediction), they would need to be revalidated in a prospective study. However, it is noteworthy that this research has demonstrated that the variables identified as important to the classification of offenders overlap considerably with those previously identified in other risk assessment tools, such as the RRASOR and STATIC-99. Designing prospective recidivism studies can be both time-consuming and expensive, and the approximation of recidivism provided by this method has considerable benefits in allowing small service providers to identify the risk characteristics of their local population.

Another relevant point here is that the limitations outlined above are of a kind associated with much of the research that is conducted in this area. Obtaining accurate estimates of the recidivism rate for sexual offending is a notoriously difficult task, given the low base rate of re-offending and the likely under-reporting of child sexual offences. Similarly, there are always doubts about the validity of data concerning the details of any offence. Both victims and perpetrators are likely to provide unreliable accounts of the offence, as typically occurs in situations where neutral observers are not present. Most research in this area is also conducted with prisoners, for whom considerable pressure to provide a socially desirable account of their offences may exist. In short, research in this field is hampered by issues related to the quality of the data. However, given the significance of the area to the community any research that can improve our decision-making and management of sexual offenders is likely to be worthwhile.

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Appendix 1: Database Coding Guidelines (2003)

General Guidelines

- All clients are to be included in the database unless they are:
  The partner of a client;
  Or, if they have an inadequate/nonexistent assessment intake report to cover the database variables.
- The database is divided into four components:
  Cumulative client data;
  Historical client data;
  Characteristics of their most recent offence (only applicable to clients with offence histories); and
  Characteristics of the client at the time of assessment at SOTAP.
- In this guide is the list of variable names in the database with a brief description of each.
- Information from initial assessment reports upon presentation to the service should inform the client data entry unless otherwise required (in which case, consult judge's sentencing remarks, individual case notes, etc). If there is no information available on any particular variable, leave the entry blank.
- If a client has multiple victims, one case is entered into the database for each victim. Ideally, the first entry should relate the characteristic information pertaining to the most recent victim, the second entry to the second most recent and so forth. A substantial amount of client data will be identical for each victim entry (for example, data relating to client characteristics at the time of assessment). However if possible, client information variables are to be adapted to describe differences in client circumstances for each victim (for example, changes in work or marital status at each time of offending).

CUMULATIVE DATA INFORMATION:

This section will need to be updated for each client upon re-referral to the service.

Gender of offender: "gender"
0= Male, 1= Female

- Enter the gender of offender at most recent referral.

Age of offender at time of assessment (in years): "ageyear"
Age in years

Most recent/main offender information: "recency"
1= Yes, 0= No (other victim information)
Code as "0" if the entry is that of a second/third/etc victim as opposed to "1" if it is the entry of the first or only victim. The case entered as "1" should be that of the most recent victim or client data with no offending history.

More than one case entered: "multiple"
1= Yes, 0= No
Enter "1" if there are multiple cases, as in clients with multiple victim entries.

Most recent referral date: "refdate"
Year
Enter the year of the most recent referral to the service.

Most recent referral source: "refsourc"
1= Corrections, 2= Police, 3= FAYS, 4= Community health, 5= Self, 6= Mental health, 7= other
Enter the referral source at most recent referral.

Mandatory or voluntary at most recent referral: "mandated"
0= Mandated, 1= Voluntary
Enter "0" for mandated if the client is attending the agency as part of a legal direction (for example, by Corrections, the court, or the parole board).

Reason for re-referral: "reason"
1= Not re-referral, 2= Continued contact following incarceration, 3= New offences, 4= Other
Enter the reason for re-referral to the service if the client has attended the service previously.

Current treatment status: "treat"
1= Left prior to commencing treatment, 2= Left during treatment,
3= Currently in treatment, 4= Completed treatment
Enter the client treatment status at the service at time of data entry.

Charges pending: "charges"
1= Yes, 0= No
Indicate whether the client had charges pending investigation at time of data entry.

Total number of known victims: "numbvic"
Total number
Only include victims who have sufficient information regarding offence characteristics detailed in the client assessment summary.

Victim data entry status: "vicstat"
0= No known victims, 1= Victim of most recent offence, 2= Victim of second-most recent offence, 3= Victim of third-most recent offence etc…
Record chronological order of victim offence history from most recent to least recent; if two victims were offended against at the same time, code both as same number.

Time elapsed between end of offending and assessment: "time"
Months
Enter time lapse between end of offending and most recent assessment rounded to the nearest known 6-month mark if exact months not known.

HISTORICAL CASE DATA
This section should remain unchanged if client data is being updated subsequent to initial entry.

First referral date: "firstref"
Year
Enter year of initial referral to service.

Years of school education: "school"
Number of years

Employment category: "employ"
1= Unemployed, 2= Unskilled labourer, 3= Sales/personal service,
4= Tradesperson, 5= Professional, 6= Manager/administrator, 7= Student,
8= Other

Physical abuse experience in childhood: "physical"
1= Yes, 0= No
Enter "1" if known physical abuse occurred in the home during childhood.

Foster experience in childhood: "foster"
1= Yes, 0= No
Enter "1" if client was fostered or removed from family home during childhood.

Sexual Abuse Experiences
Details of client's experience of child sexual abuse.

Sexual abuse experience in childhood: "abuse"
1= Yes, 0= No

Sexual abuse experience: Rape/Attempted Rape: "abrape"
1= Yes, 0= No
"Rape/Attempted Rape" includes forced unwanted actual or attempted sexual intercourse: penetration including digital and oral.

Sexual abuse experience: Indecent Assault: "abass"
1= Yes, 0= No
"Indecent assault" includes being touched in an unwanted/sexual fashion not including penetration.

Sexual abuse experience: Unlawful Sexual Intercourse/Attempted U.S.I.: "abusi"
1= Yes, 0= No
"U.S.I/Attempted U.S.I." is similar to rape category, but without physical force.

Sexual abuse experience: Indecent Exposure: "abexp"
1= Yes, 0= No
Includes the exposure of a person's genitalia.

Sexual abuse experience: Other Sex Offences: "aboth"
1= Yes, 0= No
Includes acts of sexual abuse or perceived sexual abuse not otherwise covered above: for example adult asking/inducing child to touch adult's genitals.

Number of perpetrators of sexual abuse: "numbperp"
Number
Enter number of perpetrators of sexual abuse, not instances of abuse.

Gender of perpetrators of sexual abuse: "gendperp"
1= Female, 2= Male, 3= Both, 4= No known sexual abuse

Age of perpetrators of sexual abuse: "ageperp
1= Adults, 2= <18 years old, 3= Both, 4= No known sexual abuse

Age at first sexual abuse episode: "ageabuse"
Age in years

Age at second sexual abuse episode: "agesecab"
Age in years

Age at third sexual abuse episode: "agethiab"
Age in years

First sexual abuse perpetrator: "onefam"
1= Immediate familial, 0= Non-familial
Only code as familial if abuse was in the immediate family i.e. mother, father or sibling.

Identity of sexual abuse perpetrator, first episode: "perpone"
1= Father (biological), 2= Step/foster/adoptive father, 3= Mother (biological), 4= Male sibling, 5= Female sibling, 6= Older male acquaintance/relative, 7= Older female acquaintance/relative, 8= Male stranger, 9= Professional (eg. teacher, clergy), 10= No known sexual abuse

Second sexual abuse perpetrator: "twofam"
1= Immediate familial, 0= Non-familial
Only code as familial if abuse was in the immediate family i.e. mother, father or sibling.

Identity of sexual abuse perpetrator, second episode: "perptwo"
1= Father (biological), 2= Step/foster/adoptive father, 3= Mother (biological), 4= Male sibling, 5= Female sibling, 6= Older male acquaintance/relative, 7= Older female acquaintance/relative, 8= Male stranger, 9= Professional (eg. teacher, clergy), 10= No known sexual abuse

Third sexual abuse perpetrator: "threefam"
1= Immediate familial, 0= Non-familial
Only code as familial if abuse was in the immediate family i.e. mother, father or sibling.

Identity of sexual abuse perpetrator, third episode: "perpthre"
1= Father (biological), 2= Step/foster/adoptive father, 3= Mother (biological), 4= Male sibling, 5= Female sibling, 6= Older male acquaintance/relative, 7= Older female acquaintance/relative, 8= Male stranger, 9= Professional (eg. teacher, clergy), 10= No known sexual abuse

Relationship History
Adult sexual relationships: "relation"
1= Heterosexual, 2= Homosexual, 3= Both, 4= No adult relationships
Does not include childhood or adolescent sexual experimentation.

Relationships recoded" "newrel"
1= Some adult relationships, 0= No adult relationships

Heterosexual adult relationships: "hetero"
1= Yes, 0= No

Homosexual adult relationships: "homosex"
1= Yes, 0= No

Bisexual adult relationships: "bisexual"
1= Yes, 0= No

No adult relationships: "norelat"
1= Yes, 0= No

Longest duration of adult relationships: "duration"
Number of months
Enter number of months of longest adult relationship, rounded to the nearest known 6-month mark if exact months not known.

Children: "child"
1= Yes, 0= No

Number of children: "children"
Number of biological children.
Do not include step, adopted or foster children

Non-sexual Offences
Total number of previous non-sexual convictions: "nonsexof"
Number
Do not include driving/speeding offences unless incurred conviction. Approximate if client has an extensive history.

Age at first non-sexual conviction: "agenon"
Age in years

Any previous non-sexual offence convictions: "anyoff"
1= Yes, 0= No

Convictions can be entered in multiple categories below if applicable

Previous violent non-sexual convictions: "violoff"
1= Yes, 0= No
Include physical assault.

Previous property-related convictions: "propoff"
1= Yes, 0= No
Include break-and-enter, robbery, etc.

Previous drug-related convictions: "drugoff"
1= Yes, 0= No
Include convictions specifically drug-related; include drug-related traffic offences.

Previous driving/traffic-related convictions: "drivoff"
1= Yes, 0= No

*Previous Sexual Offences (**not including most recent offence)*
History of sexual offending: "sexoff"
1= Yes, 0= No

Total number of previous sexual convictions: "numbconv"
Number

Age at first sexual conviction: "ageconv"
Age in years

Previous Rape/Attempted Rape Convictions: "prevrape"
Total Number
See definitions above for offence categories.

Previous Indecent Assault Convictions: "prevass"
Total Number

Previous Unlawful Sexual Intercourse/Attempted U.S.I. Convictions: "prevusi"
Total Number

Previous Indecent Exposure/Behaviour Convictions: "prevexp"
Total Number

Previous Other Sex Offence Convictions: "prevoth"
Total Number

Previous Rape/Attempted Rape Charges: "prrapch"
Total Number

Previous Indecent Assault Charges: "prassch"
Total Number

Previous Unlawful Sexual Intercourse/Attempted U.S.I. Charges: "prusich"
Total Number

Previous Indecent Exposure/Behaviour Charges: "prexpch"
Total Number

Previous Other Sex Offence Charges: "prothch"
Total Number

Total number of previous sexual convictions/ charges: "presxoff"
Total number

- Combine totals for previous sexual conviction/charge variables

Paraphilias
Presence of paraphilias summary: "parasumm"
1= Yes, 0= No/not known

Total number of paraphilias: "numbpara"
Number
Enter total number as indicated by MSI results, self-report or offence record, not including paedophilia.

Exhibitionism: "exhibit"
1= Yes, 0= No

Fetishism: "fetish"
1= Yes, 0= No

Frotteurism: "frotteur"
1= Yes, 0= No

Masochism: "masochis"
1= Yes, 0= No

Sadism: "sadism"
1= Yes, 0= No

Voyeurism: "voyeur"
1= Yes, 0= No

Transvestism: "transves"
1= Yes, 0= No

Other Paraphilia: "othepara"
1= Yes, 0= No

Pornography
Use of adult pornography: "pornuse"
1= Yes, 0= No/ not known

Amount of use of adult pornography: "adulporn"
1= No, 2= Not known, 3= Sporadic use (<once a month), 4= Regular use (>once a month)

Use of child pornography (ever used): "childpor"
1= Yes, 0= No/Not known

Substance Use
Substance use: "drug"
1= Yes, 0= No

Amount of substance use (current): "druguse"
1= None, 2= Recreational/occasional use, 3= Substance dependence
Tolerance, withdrawal, and compulsive drug-taking behaviour demonstrate substance dependence. 'Recreational/occasional use' only applies to illicit substances, not alcohol, whereas 'substance dependence' applies to both.

Substance of dependence: "drugdep"
1= None, 2= Alcohol, 3= Illicit drug, 4= Alcohol and illicit drug

VICTIM CHARACTERISTICS

Only complete for cases with offending/alleged offending history. Detail characteristics of most recent victim, or if client has multiple victims, detail characteristics of victim for whom the entry is created. This section may need to be updated for each client upon re-assessment by the service.

Age at time of sexual offence: "ageoff"
Age in years
Enter client age at the commencement of sexual offending with victim if offending occurred over lengthy period of time.

Immediate familial relationship to victim: "famvic"
1= Yes, 0= No
Do not include pseudo-familial offending in this variable.

Relationship to victim typology: "relatype"
1= Familial victims only, 2= pseudo-familial victims only, 3= non-familial victims only, 4= cross-relationship offending, 5= no victims (e.g. pornography charges)

Relationship to victim; condensed: "newrelat"
1= Familial, 2= pseudo-familial, 3= non-familial, 4= no single victim (e.g. pornography charges)
Enter familial if offender biologically related to victim, pseudo-familial if offender involved in guardianship role of victim (e.g. step-parent) and enter non-familial for unrelated victims.

Relationship to victim: "relatvic"
1= Biological parent, 2= Step/foster/adoptive parent, 3= Sibling/cousin, 4= Uncle, 5= Grandparent, 6= Acquaintance, 7= Stranger, 8= Professional relationship, 9= no single victim (e.g. pornography charges)

Victim gender typology: "gendtype"
1= Female victims only, 2= Male victims only, 3= Male and female victims, 4= No victims (e.g. pornography charges)

Any male victims for this offender: "malevic"
1= Yes, 0= No

Any female victims for this offender: "femalvic"
1= Yes, 0= No

Victim gender: "vicgend"
1= Female, 2= Male, 3= no single victim (e.g. pornography charges)

Victim age typology (years): "agetype"
1= 1-5 only, 2= 6-12 only, 3= 13-16only, 4= multiple age groups, 5= no victim

Victim age at onset of offending(years); categorical: "newvicag"
1= 1-5, 2= 6-12, 3= 13-16, 4= no single victim

Victim age at onset of offending: "vicage"
Age in years

Frequency of offending: "freqoff"
1= Single instance, 2= 2-5 instances, 3= 5-10 instances, 4= Persistent offending, 5= not known, 6= no single victim (e.g. pornography charges)

Duration of offending: "duroff"
Number of months (less than one month also= 1)

Number of Rape/Attempted Rape Convictions: "rapeconv"
Total Number
See definitions above for offence categories.

Number of Indecent assault Convictions: "assconv"
Total Number

Number of Unlawful Sexual Intercourse/Attempted U.S.I. Convictions: "usiconv"
Total Number

Number of Indecent Exposure/Behaviour Convictions: "expconv"
Total Number

Number of Other Sex Offence Convictions: "othconv"
Total Number

Number of Rape/Attempted Rape Charges: "rapcharg"
Total Number

Number of Indecent Assault Charges: "asscharg"
Total Number

Number of Unlawful Sexual Intercourse/Attempted U.S.I. Charges: "usicharg"
Total Number

Number of Indecent Exposure/Behaviour Charges: "expcharg"
Total Number

Number of Other Sex Offence Charges: "othcharg"
Total Number

Number of Rape/Attempted Rape Allegations (current and past): "rapall"
Total Number

Include allegations of offending, current and past, if client has not been formally charged.

Number of Indecent Assault Allegations (current and past): "assall"
Total Number
Include allegations of offending, current and past, if client has not been formally charged.

Number of Unlawful Sexual Intercourse/Attempted U.S.I. Allegations (current and past): "usiall"
Total Number
Include allegations of offending, current and past, if client has not been formally charged.

Number of Indecent Exposure/Behaviour Allegations (current and past): "expall"
Total Number
Include allegations of offending, current and past, if client has not been formally charged.

Number of Other Sex Offence Allegations (current and past): "othall"
Total Number
Include allegations of offending, current and past, if client has not been formally charged.

Child pornography offences (current and past): "pornoff"
1= Yes, 0= No
Include allegations of offending, current and past, if client has not been formally charged.

Substance abuse at time of offence: "substance"
1= Yes, 0= No

Type of substance abuse at time of offence: "subsoff"
1= None, 2= Alcohol, 3= Other drugs, 4= Both
Enter if specific reference is made to being under the influence of drugs/alcohol at the time of offending, not if only has history of alcoholism/drug abuse.

Pain preceding offence (in month prior): "pain"
1= Yes, 0= No

Type of pain preceding offence (in month prior): "painoff"
1= None, 2= Back, 3= Neck, 4= Other/mixed
Enter if specific reference is made to experiencing pain at or preceding the time of offending, not if only has history of pain.

Self-reported emotional state on day of offence: "emotoff"
Text Variable
Enter self-reported emotional state on the day of offending; enter "unknown" if no information given or client denies..

Masturbation frequency preceding offending (in month prior): "mastoff"
1= Not known, 2= Several times/day, 3= Daily, 4= Weekly, 5= Monthly,
6= Never

Presence of child-related fantasy preceding offending (in month prior): "fantoff"
1= Yes, 2= No, 3= Not known
Enter "not known" unless certain of absence of fantasy; as opposed to entering "no" from client self-report.

Presence of planning preceding offending (in month prior): "planoff"
1= Yes, 2= No, 3= Not known
Enter "not known" unless certain of absence of planning; as opposed to entering "no" from client self-report.

Presence of grooming preceding offending (in month prior): "groomoff"
1= Yes, 2= No, 3= Not known
Enter "not known" unless certain of absence of grooming; as opposed to entering "no" from client self-report.

Main life-stressor cited preceding offending (in month prior): "stress"
1= Yes, 0= No

Main life-stressor cited preceding offending (in month prior): "stresoff"
1= None, 2= Family/relationship, 3= Work/financial, 4= Physical disability/illness, 5= Sex offending, 6= Other
Enter if specific reference is made to being under the influence of a certain life-stressor at the time of offending.

Employment status preceding offending (in month prior): "empoff"
1= Employed, 0= Unemployed

Employment category preceding offending (in month prior): "empoff2"
1=P/T or casual, 2=F/T, 3=disability pension/aged pension/student, 4=unemployment benefit, 5= carer benefit/single-parent pension

Marital status preceding offending (in month prior): "marroff"
1= Married/de facto, 0= Single/separated

Marital category preceding offending (in month prior): "marroff2"
1=single, 2=de facto, 3=married, 4=divorced, 5=widowed, 6=separated, 7= girlfriend/boyfriend

CASE CHARACTERISTICS AT TIME OF ASSESSMENT

This section will need to be updated for each client upon re-assessment by the service.

Employment status(at time of assessment): "empnow"
1= Employed, 0= Unemployed

Employment category (at time of assessment): "empstat"
1=P/T or casual, 2=F/T, 3=disability pension/aged pension/student, 4=unemployment benefit, 5= carer benefit/single-parent pension, 6=incarcerated

Marital status (at time of assessment): "marry"
1= Married/defacto, 0= Single/separated

Marital category (at time of assessment): "maristat"
1=single, 2=de facto, 3=married, 4=divorced, 5=widowed, 6=separated, 7= girlfrind/boyfriend

Masturbation frequency: "maststat"
1= Not known, 2= Several times/day, 3= Daily, 4= Weekly, 5= Monthly, 6= Never

Presence of child-related fantasy: "fantstat"
1= Yes, 2= No, 3= Not known
Enter "not known" unless certain of absence of fantasy; as opposed to entering "no" from client self-report.

Self-reported emotional state regarding offending: "emotstat"
Text Variable

Denial regarding offending: "denial"
1= No offending, 2= Denies the offence took place, 3= Denies the interaction was sexual in nature (eg. Accidental touching), 4= Denies the sexual interaction was an offence (eg. Victim consented), 5= Denies full extent of offending, 6= No denial

Denial of fact regarding offending: "dfact"
1= Yes, 0= No

Denial of responsibility regarding offending: "dresp"
1= Yes, 0= No

Denial of sexual intent regarding offending: "dsexual"
1= Yes, 0= No

Denial of wrongfulness regarding offending: "dwrong"
1= Yes, 0= No

Denial of self-determination regarding offending: "dselfdet"
1= Yes, 0= No

Presence of Psychopathology: "psypath"
1= Intellectual Disability, 2= Major mental illness, 3= Organic impairment, 4= None noted

- Enter if known from certain assessed diagnosis, not speculation. "Major mental illness" denotes major psychopathology, for example, schizophrenia, Bipolar Disorder and does not include personality disorders.

Summary of presence of any psychopathology: "newpath"
0= None noted, 1= Psychopathology noted

- Code 1= Psychopathology noted if client seen to have Intellectual Disability, Major metal illness, or organic impairment as seen in "psypath" variable.

Appendix 2: **Clinical Risk Assessment**

Clinical methods of risk assessment employ the use of professional judgment of case materials and intuition based on the assessor's previous experience. The *unguided clinical approach* bases any assessment of risk on a review of case material without any systematic a priori weighting of the importance of case data. The *guided approach* differs from the unguided approach in that there is an a priori weighting of case information based on the clinician's own theories. These weightings will be, in part, based on the clinician's understanding of the aetiology of child sexual offending. The *unguided* and *guided* clinical approaches offer flexibility for considering the unique characteristics and circumstances of individuals when assessing risk. However, these clinical approaches are likely to be idiosyncratic and to be more influenced by the personal biases of the clinician (Doren, 2002).

In the *anamnestic approach*, the practitioner analyses the subject's life history in order to determine factors of importance to the subject's demonstrated risk, and then examines the degree to which those conditions remain (Doren, 2002). A structured framework for the process of anamnestic risk assessment may be used by the clinician (e.g., Towl & Crighton, 1997).

Appendix 3: List of Variables Considered for Inclusion in Specific Risk Classification Scales

Physical abuse experience in childhood

Foster experience in childhood

Sexual abuse experience in childhood

Relationships recoded (relationship history)

Length of relationship exceeding 24 months

Any previous non-sexual offending

Previous violent/assault non-sexual conviction

Previous property-related convictions

Previous drug-related convictions

Previous driving/traffic-related convictions

History of sexual offending

Presence of paraphilias

Use of adult pornography

Use of child pornography

Substance use

Age at time of offence (Static-99 cut-off)

Age at time of offence (age 32 cut-off)

Child pornography offences

Presence of child-related fantasy preceding offending (in month prior)

Presence of planning preceding offending (in month prior)

Presence of grooming preceding offending (in month prior)

Employment status preceding offending (in month prior)

Marital status preceding offending (in month prior)

Psychopathology summary

Any male victims

Any female victims

Any stranger victims

Any unrelated victims