Running Head: California Sex Offender Risk Project

Predicting Likelihood of Future Sexual Recidivism: Pilot Study Findings from a California Sex Offender Risk Project and Cross-validation of the Static 99

Shoba Sreenivasan, Ph.D.[1], Thomas Garrick, M.D.[2], Randall Norris, PhD.[3], Sarah Cusworth-Walker, Ph.D.[4], Linda E. Weinberger, Ph.D.[5], Garrett Essres, Ph.D.[6], Susan Turner, Ph.D.[7], Terry Fain, M.A., M.S.[8]

1 Clinical Professor of Psychiatry and the Behavioral Sciences, University of Southern California, Keck School of Medicine

2 Professor of Psychiatry, University of California, Los Angeles, Geffen School of Medicine

3 Chief Psychologist, California Institution for Men California Department of Corrections and Rehabilitation (CDCR)

4 Research Associate University of Washington School of Medicine

5 Professor of Clinical Psychiatry and the Behavioral Sciences, University of Southern California, Keck School of Medicine

6 Senior Psychologist, California Mens Colony California Department of Corrections and Rehabilitation(CDCR)

7 Professor of Criminology, Law, and Society University of California, Irvine

8 Project Associate, Public Safety and Justice RAND Corporation

Address for correspondence: Shoba Sreenivasan, Ph.D.
GLA-VA Medical Center
11301 Wilshire Blvd.
Mental Health Administration
Mail code 691-B116AC
Los Angeles, CA 90073

email: Shoba.Sreenivasan@med.va.gov

ABSTRACT

Pilot findings on 137 California sex offenders are presented followed over ten years after release from custody (excluding cases where legal jurisdiction expired). The sexual recidivism rate, very likely inflated by sample selection, was 31% at five-years and 40% at ten-years. Cumulatively, markers of sexual deviance (multiple victim types) and criminality (prior parole violations and prison terms) led to improved prediction of sexual recidivism (ROC=.71, r=.46) than singly (multiple victim types: ROC=.60, r=.31; prior parole violations and prison terms: ROC=.66, r=.37). Long-term Static 99 sexual recidivism statistical predictive accuracy was lower in our sample (ROC=.62, r=.24) than the values presented in the developmental norms. Sexual recidivism rates were higher in our study for Static 99 scores of 2 and 3 than in the developmental sample, and lower for scores of 4 and 6. Given failures to replicate developmental norms, the Static 99 method of ranking sexual recidivism risk warrants caution when applied to individual offenders.

Since the advent of the Sexually Violent Predator/Sexually Dangerous Person (SVP/SDP) statutes (1), a number of sex offender risk actuarial instruments have been developed. For the purposes of SVP/SDP commitment, most states require at least a qualitative assessment of risk level. In some states, such as Washington, a quantification of sexual recidivism risk above 50% is required (1). The four most commonly used risk scales are the SORAG (Sex Offender Risk Assessment Guide), MnSOST-R (Minnesota Sex Offender Screening Tool-Revised), the RRASOR (Rapid Risk Assessment of Sexual Offense Recidivism), and the Static 99 (2-8).

All four sex offender risk methods demonstrate statistically moderate correlations with sexual recidivism (9, 10). A moderate statistical accuracy warrants the caution of over or underestimation of risk when group based actuarial rates are applied to an individual. Moreover, the tools are developed generally on composite samples from different sites and cohorts because of the difficulty in accessing the complete prison files of a single, large cohort group. Consequently, many researchers amalgamated existing data-sets from different sites to obtain adequate sample sizes (10, 11). This practice, however, occurs at the cost of introducing variability. There are few empirical investigations as to the applicability of actuarials to ethnically diverse groups that differ from the normative samples upon which the tools were based. In addition, there remains a lack of cross-validation in many of the U.S. jurisdictions, such as California (12), where actuarials are used routinely in civil commitment risk assessments.

While proponents of actuarial risk assessment argue that risk tools represent the superior method over clinical judgment in predictive ability (11), actuarials have the potential for misuse in applied risk assessments if the obtained risk percentages for a

specific score are represented as predictive of a specific individual committing a future sexual offense. While beyond the scope of this paper, it should be noted that use of actuarials risk assessments in SVP/SDP evaluations continues to foster debate among forensic researchers and clinicians (5, 13, 14).

The purpose of this paper is to present pilot findings from a California sex-offender risk assessment project. Two primary areas are targeted: the statistical identification of predictive risk markers as potential variables for a risk assessment tool; and to examine whether the most commonly used actuarial, the Static 99, offers a sufficiently reliable and accurate model of risk for sexual re-offense in a racially and culturally diverse prison sample. Static 99 was selected for analysis as it represents the actuarial method of risk assessment used most frequently.

Overview of Static 99 and its Limitations: The Static 99 was developed by Hanson and Thornton (10) as an amalgamation of the RRASOR and the SACJ-Min (Structured Anchored Clinical Judgment-Minimum) (15). The risk factors for the RRASOR were derived from a factor analysis of seven follow-up studies and one replication sample (4, 6). Recidivism for the RRASOR was defined primarily as sexual re-conviction. The RRASOR items included prior sexual offenses (excluding the last sex offense called the "index offense"), age at release, victim gender, and relationship to victim. The Static 99 included all the RRASOR items and added the SACJ-Min items of sex offense against a stranger, non-contact sexual offense, cohabitation status, non-sexual assault, and number of sentencing events greater than four.

In a comparison of the two scales, the Static 99 had a higher statistical association with sexual recidivism than the RRASOR (10). This prompted Hanson and Thornton

(10) recommend the use of the Static 99 over the RRASOR. Of note, Hanson and Morton-Bourgon's (9) meta-analysis found only a small association with sex offender recidivism for several of the RRASOR and Static 99 variables (non-contact sexual offense, prior criminal history/history of non-sexual crimes) As with the other actuarials, the overall scores for both the Static 99 and RRASOR demonstrated a statistically moderate predictive accuracy to sexual recidivism (9, 10). Both scales weight heavily prior sex offenses over other factors because of its robust association with sexual recidivism (4,9).

The Static 99 was not developed on a single cohort of released sex offenders, but consisted of amalgamating data collected previously from different sites: two Canadian secure psychiatric facilities, one Canadian prison, and one United Kingdom prison. While the sample size of 1,228 allowed for sufficient statistical power, the data did not represent one cohort group (i.e., they were not all released during the same period from the same facility or same type of facility). In addition, some of the predictor variables for the Static 99 risk scale were missing in the developmental sample. For example, the Institut Philippe Pinel sample did not have information about the predictor variables--stranger victims and non-contact offenses; the Millbrook sample was missing information on conviction for non-contact sexual offenses; the Oakridge sample had data for relationship to victim only for the most serious offense, counted any male child victims as opposed to male victims regardless of age, and recorded only the most serious last sexual offense). When data were missing, statistical procedures were used to estimate values, a procedure that is less than ideal. Thus, the Static 99 relied on less than optimal sampling in order to obtain sufficient sample sizes. This merely underscores the state of

the art in sexual recidivism risk assessment and the difficulty in obtaining large samples with sufficiently broad data from a single cohort.

Currently, the Static 99 has the most cross-validation studies of any of the actuarials, marking this rating tool as the most researched of the reviewed actuarial measures (16-20). These studies and reports demonstrated that the Static 99 has moderate statistical association with sexual recidivism risk in Canadian, United Kingdom, and select American samples (Vermont, Texas) (16, 18, 21-26). The advantages of the Static 99 are that it offered a quick method of rating risk, and the normative data from the original sample had good inter-rater reliability (27). However, risk percentages appeared to vary dependent on the base rate of sexual recidivism in the sample studied. Doren (28) examined the correspondence of the developmental risk percentages for Static 99 scores in 7 studies for a five-year follow-up period. Doren found that the underlying sexual recidivism base-rate of the sample impacted the risk percentage associated with a specific Static 99 score which led to differences from that derived from the developmental sample. For low-risk scores (in the 1 and 2 range), when the sample had a high underlying base-rate of sexual recidivism, there were higher risk percentages associated with the score than that in the developmental sample. High-risk scores revealed lower than expected risk percentages when the underlying base rate was low, but remained similar to the developmental sample when the base rates were high. The Doren data demonstrated a failure to replicate the Hanson and Thornton developmental norms.

Defining Sexual Recidivism: The definition of sexual recidivism varied across actuarial schemes. Some studies used convicted crimes, reflecting a conservative strategy based upon adjudicated offenses for which a guilty verdict was found and the

individual sanctioned (11). However, as is widely acknowledged, such a definition can underestimate the true rate of recidivism as it is based on both apprehensions and punished offenses (10, 29, 30).

In an attempt to determine the full extent of sex offending, the U.S. Department of Justice (D.O.J.) compared statistics from U.S. law enforcement reports of sexual offense arrests to data from the National Crime Victimization Survey report (29). It should be stated that these data reflected estimates of the baseline frequency of acts. The U.S. D.O.J. document noted that in 1995, individuals aged 12 and older reported to the National Crime Victimization Survey that they experienced 260,300 incidents of attempted or completed rape. By contrast, the number of such crimes actually reported to the police in 1995 was 97,460. Thus,, only 37% of the sexual crimes reported to the National Crime Victimization Survey came to the attention of law enforcement leaving a high number (63%).of undetected offenses. Moreover, even among those crimes reported to the police, only one-half resulted in the identification and arrest of a perpetrator (i.e., 48,730 of the reported 97,460 sexual assaults). The Bureau of Justice Statistics findings for the years 1992 through 2000 mirrored these findings; i.e., 63% of completed rapes, 65% of attempted rapes, and 74% of completed and attempted sexual assaults against females were not reported to the police (31).

Therefore, a comprehensive outcome definition for sexual recidivism should include arrests, convictions, and parole/probation or in-custody sexual violations in order to address the issue of underestimation of risk created by more limited definitions of sexual recidivism, such as convicted offenses. Nonetheless, even this broad method represents "observed rates." The true rate of sexual recidivism would include the

"unobserved" or unreported sexual assaults (32).

Sample Generalizability: The Static 99 was based on Canadian and U.K. developmental and cross-validation samples (10). The sample was described as predominantly Caucasian; consequently, it may have limited applicability to racially diverse U.S. prison samples. Sample limitations could reduce the efficacy and even the applicability of an actuarial tool, a concept articulated in evidence-based medicine (33). Laws, enforcement methods, judicial procedures, sanctions, and community monitoring differ across countries as well as across U.S. jurisdictions. Such differences contribute to varying base-rates of detected sexual recidivism. Relatedly, the sexual recidivism percentages given in the development study for the Static-99 have not been corroborated in cross-validation studies (28).

Identifying Sex Offender Risk Predictor Variables: In our study, the predictive markers for sexual recidivism were derived from the existing research base with the most promising variables selected for inclusion in the analyses. The Hanson and Bussiere (4) meta-analytic review examining 23,393 sex offenders, using 61 data-sets and 165 predictor variables, represented a landmark contribution to the identification of risk predictors. Hanson and Bussiere identified several factors that correlated with sexual re-offending. These factors included past sexual offences, male victims, stranger victims viewed as proxy variables for sexual deviance, as well as general criminality factors such as past non-sexual violent offences, antisocial personality and psychopathy.

A second updated meta-analysis by Hanson and Morton-Bourgon (9), using 95 studies and 31,000 sex offenders, confirmed the 1998 meta-analysis, but also added new predictors such as the ability to comply with conditions of supervision. Recently,

Roberts, Doren and Thornton (34) conducted a Principal Components Analysis on ten actuarial items, those from the Static 99 and the Risk Matrix 2000 (a risk assessment instrument used in the United Kingdom). Roberts et al. identified three factors as associated with sexual recidivism; i.e., general criminality, sexual deviance, and detachment. The general criminality factor consisted of a history of prior violent and nonviolent offenses; the sexual deviancy factor consisted of prior sexual offenses, non-contact sex offenses, and male victims; and the detachment factor consisted of having a stranger victim and never being married. Barbaree, Langton and Peacock (35) conducted a similar statistical analysis on a sample of 311 sex offenders from a medium security Canadian federal penitentiary. They examined 38 unique items taken from five actuarial instruments (VRAG, SORAG, RRASOR, Static 99, and MnSOST-R). Six principal factors were found to be associated with sexual recidivism, encompassed by antisocial behavior and sexual deviance (e.g., detached predatory behavior such as selecting stranger victims or offending in a public place). Barbaree et al. found that violent recidivism was predicted by the antisocial realm, while sexual recidivism was predicted by the factors associated with sexual deviance (such as persistence of sexual offending, child sexual abuse). These studies suggested that markers of sexual deviance and criminality may be predictive singly or cumulatively of sexual recidivism risk. Aggression during the sexual offense may be a predictor (8) , although the recent Hanson and Morton-Bourgon meta-analysis did not support this marker (9).

Rationale for Presenting Pilot Data: California-based cross-validation of the Static 99 as well the identification of groups of predictive risk variables have the advantage of including the demographics specific to a racially and culturally diverse U.S.

prison population. Given the intensity of effort required to collect even pilot data, these findings are presented as preliminary in a long-term ongoing study.

Methods

This project underwent review and was approved by the California Department of Corrections and Rehabilitation (CDCR) Research Board (11/15/01; 1/30/04). Safety procedures were instituted to assure the confidentiality of any information gathered from the archival data review.

Pilot Sample:

Files. A total of 5,898 sexual offender cases (i.e., both active and inactive) were identified by the CDCR as released from prison between January 1, 1989 and December 31, 1990. Active files represented 29% (N=1,709) and inactive files represented 71% (N= 4,189) of the total sample pool of 5,898. Of the active files, (N=1,790), 137 (8%) were selected to serve as the pilot sample.

Active files were cases remaining under supervision (i.e., in custody or on parole) as reflected by a CDCR list generated in June of 2002. Inactive files were cases where the CDCR jurisdiction over the individual had expired sometime in the period between their release in 1989/90 and the generation of the June 2002 list. Active files were selected for the pilot study as these files contained full criminal histories (i.e., state and federal "RAP" sheets, police reports, parole reports, prison rules violations) and demographic information. Inactive files would have had a circumscribed data set given the "thinning" of materials for storage, and criminal histories would have been limited to state "RAP" sheets at follow-up. This sample selection of active files likely created a

bias towards inflating the rate of sexual recidivism, as the individuals in the sample had re-offended in some manner after their release from prison custody in 1989/90 to June 2002 when the sample pool list was generated.

The majority of prison active files were located in five custodial locations, three of which were selected for the pilot study. These three sites were chosen as they represented different levels of security ("medium-low," "medium" and "high"). Fourteen (10%) files were selected from the "medium-low" level prison, 27 (20%) files from the "medium" prison, and 11 (8%) files from the "high" security prison. In addition, one of two parole sites in the state (the one with the largest number of parolees) was selected as source for inclusion in the pilot study (N= 85, 62%). All active files (prison and parole) that were available at the sites on the date of the file review were included. We acknowledge that this is not a random sample. This method of file selection was used because the authors had no control over: logistical issues, such as staff availability at custodial sites to pull specific identified files; the inability to locate certain files at a site given the fluidity of transfers between institutions and parole; and time and resource limitations of the availability of trained file reviewers.

A 1989/90-release date assured that all in the pilot sample had at least one period of community placement. All individuals in the study incurred a sexual offense some time in their criminal history. In some instances the sexual offense was the "controlling offense" for their 1989/1990 release. In other cases, the sexual offense was a prior offense with the 1989/1990 "controlling offense" being a non-sexual offense.

Definition of Sexual Offense. Sexual offenses were defined as arrests, convictions, parole violations, or prison rule violations incurred for sexual criminal

behavior. The sexual offenses included those involving force and violence, or substantial sexual conduct, such as either the offense itself or an attempted offense of: rape with force; rape with threat of future retaliation; rape or penetration of genital or anal openings by foreign objects; rape in concert by force or violence; spousal rape with threat of future retaliation; sodomy; oral copulation; all sections of lewd acts on a child under 14, 16, or 18; and penetration with a foreign object.

"Non-contact" offenses such as exhibitionism, voyeurism, or annoy/molest a child were also included as sexual offenses. In addition, an offense was coded as a sexual offense for charges of mayhem, battery, or murder when the file indicated a clear sexual component and this was not filed separately, or if filed, the individual was convicted only of the non-sexual offense. Sexual offenses excluded as either an initial sexual offense or for recidivism were solicitation/prostitution, pimping, consensual sexual encounters in custody resulting in prison sanctions, and charges of indecent exposure in custody that would not meet the legal criteria for exhibitionism in the community.

Definition of Sexual Recidivism. Sexual recidivism was defined as sexual re-offending that occurred after the 1989/90 release and during an approximate 10+ year follow-up period. The definition of sexual recidivism was any sexual behavior following release that resulted in sanctions, such as arrest, conviction, parole violation, probation violation, or in-prison rules violation that would meet the definition of a sexual crime (excluding pimping and prostitution).

Procedures: In addition to four of the authors, forensic psychologists and psychiatrists familiar with prison records and the research protocol conducted the archival review.

Ten files were coded independently by two reviewers to determine inter-rater reliability of recording information; in all cases, the same information was recorded suggesting that the items on the protocol data sheet were easily coded.

Measurements. Files were coded for: demographics; specifics of each sexual offense, including victim type, relationship, type and nature of violence; institutional behavior; parole behavior; medical and psychiatric treatment; drug and alcohol abuse history; developmental variables, such as school functioning; gang membership; I.Q. scores; reading ability; and juvenile and adult criminal history. Using a weighted scale devised by Quinsey, Harris, Rice, and Cormier (11) and based on Canadian criminal code, all violent acts involved in the first sexual offense were totaled to give an overall violence score. A similar approach was used for less violent or non-violent behaviors that accompanied the first sexual offense.

Static 99 ratings. The Static 99 was scored at the time of the 1989/90 release using *only* that information available at the-release point date. The Static 99 was scored for each case by one investigator trained in the coding rules (36) who had extensive experience using the Static 99 in Sexually Violent Predator evaluations. Moreover, the Static 99 was scored in a jurisdiction where evaluator Static 99 rater reliabilities were calculated (27). Hanson found evaluator rater reliabilities to have .91 average item percent agreement and .80 average item Kappa, and .97 intra-class correlation for total scores (27). Other studies also demonstrated high inter-rater reliability of the Static 99 (over .90) (16, 36). The tool has ten elements that address "static" or non-changing factors: prior sex offenses (excluding index offense); prior sentencing dates (excluding index offense); any conviction for non-contact sexual offenses (excluding index offense);

index non-sexual violence; prior non-sexual violence; any unrelated victims; any stranger victims (known for under 24 hours); any male victims; young; and single.

Data Analysis:

Predictive conceptual risk markers. Based on findings in the literature, three predictive conceptual risk markers (sexual deviancy, criminality, and aggression) were used (8, 9, 34): These risk markers were rated from information available in the files prior to the 1989/90 release date to predict sexual recidivism at the follow-up points. The risk markers are presented in Table 1.

Follow-up period. A 10+ year period was used because longer follow-up periods yield higher base rates of recidivism and capture re-offenses missed by studies with follow-up periods of less than five years (11, 32, 37-40). The follow-up period in this study was defined as the number of years from the 1989/90 release date to the archival record review date conducted between June , 2002 and December, 2004. This allowed for a minimum period of ten years from at least one known release to the community.

Results

Follow-up Period from Release to File Review Date: The mean follow-up for the overall sample was 13.80 years (s.d.=.85) from the 1989/90 release to date of the file-review. This period allowed for sufficient follow-up as to calculate the Static 99 and predictive risk marker variables for sexual re-offense at five and ten-years post release.

Characteristics of the Sample:

a. Demographics Table 2 presents demographic and criminal history characteristics of the sample. The majority of the sample was African-American,

followed by whites and then Hispanics. This breakdown was not representative of the racial distribution of those currently incarcerated in California state prisons. As of June, 2005 the CDCR website listed the inmates' racial classification and percentages as : Hispanics (37%), Whites (29%), and Blacks (29%). However, the authors do not know the overall racial distribution for CDCR in 1989/90.

b. Characteristics of the offender at first sexual offense. Table 3 lists the characteristics of the offender at the time of his first sexual offense. Most offenders were in their twenties, and most were single when they were first arrested.

c. Characteristics of the victim for the first sexual offense: The most common victims were adult female strangers. Overall, of the 127 primary victims with known characteristics, 78 (61%) were adults, 39 (31%) were children aged less than 14, and 10 (8%) were adolescents aged 14-17; in addition, 101 (80%) were female, 26 (20%) were male; 79 (62%) were strangers, 14 (11%) were relatives, and 34(27%) were acquaintances.

d. Two or more victims for the first sexual offense. In 25 (18%)cases, the offender had a second victim where charges were filed. In four (3%) cases, the offender had a third victim where charges were filed. In addition, there were 19 (14%) sex offenders who had more than one alleged victim where no charges were filed.

e. *Characteristics of violence for the first sex offense*. The most common form of violence was battery, which occurred in 36 (26%) cases for the first offenses. The battery was most often against adult strangers. Strangulation was used in 10 (7%) cases. Six (4%) sex offenders stabbed their victims, two (1%) maimed their victims, and one (1%) killed his victim.

f. Survival distribution 1st to 2nd sexual offense. Of the 137 sex offenders in the pilot sample, 79 (58%) had only one sanctioned episode of sexual offending. The remaining 57 (42%) committed another sexual offense. The survival distribution of these 57 sex offenders, from the first to the second sexual offense, indicated that within five years subsequent to their first sexual offense, 26 (46%) sex offenders had committed their second sexual offense. By the 10-year point, an additional 18 (32%) sex offenders had committed their second sexual offense. The remaining 13 (23%) individuals committed their second sexual offense between 10-21 years after their first sexual offense. The elapsed time (estimated in days) between the first and second sexual offense ranged from less than a year to more than 21 years. Offenders who did not have a second sexual offense were excluded from this analysis.

The above analysis does not account for availability of opportunity to offend; that is, time at risk in the community. In some instances, individuals were in custody for offenses other than a sexual offense following their first sexual offense and prior to the commission of their second sexual offense. When we calculated the available opportunity to offend, the mean time in the community from the first to the second sexual offense was seven years. Nearly half (25/57 or 46%) of those with two or more sanctioned sexual offenses had five or less years of opportunity to re-offend prior to their second sexual offense.

Predictive Risk Marker Analyses: For Five and 10-year Sexual Recidivism:

a. Sexual Deviance Marker: 5 and 10 years post-release date. We were first interested in examining, through Cox regression, a sexual deviance marker of explanatory variables, which were drawn from sexual offenses that occurred prior to the participants'

1989/90 release date. Cox regression is a nonparametric technique that estimates the effect of multiple explanatory variables (or covariates) on whether a particular event will occur. For our purposes, its advantage over other multivariate analyses is the ability to account for the passage of time. In this study, we looked at whether the variables in our sexual deviance marker were associated with the first sexual recidivist act after the 1989/89 release date. Because some of the participants had not reoffended at the time of follow-up, it was not possible to ascertain the length of time from release to the first sexual re-offense; consequently, these cases were censored from the analysis. The variables in the sexual deviance marker were selected based on previous research, which found them to be significantly associated with sexual recidivism. These variables included a sexual offense with a stranger (yes/no), a sexual offense with someone unrelated (yes/no), multiple types of victims (yes/no), three or more total victims (yes/no), prior sexual offenses (1, 2 or 3 or more), and meeting the minimum time-frame required by DSM-IV Criterion A paraphilia: i.e., sexual offending over a six month period (yes/no). This marker was operationalized as either the occurrence of repeated offenses separated from one another by at least six months or repeated offenses occurring within at least a six-month time frame (e.g. one victim repeatedly molested during at least a six month period). The time variable was the time from the participants' release date in 1989/90 until their first sexual offense post-release. The participants who did not reoffend in this time were treated as censored cases. The status variable was whether or not the participant had a sexual offense within five years.

Cox regression was used to perform a survival analysis of recidivism at five years after the release date in 1989/1990. Cox regression is a common survival analysis

technique that is used to study the time between entry to a study and a subsequent event:– in our study, the subsequent event was the participant's first sexual offense post-release. The regression allowed us to estimate the effect of multiple explanatory variables on whether the participants would sexually re-offend while controlling for time.

The variables were entered into the regression in one step and the overall model was significant, Chi Square (6) = 41.47, $p < .001$. Table 4 shows the coefficients for the regression. Having multiple types of victims was the only variable significantly associated with years from post-release in the positive direction. This indicates that the hazard for recidivism was higher for participants who had multiple types of victims. The hazard ratio for multiple types of victims (Exp(B) = 8.10) indicates that participants with multiple types of victims were approximately eight times more likely to have a sexual offense after release then those without multiple types of victims.

Another Cox regression was used to investigate the effect of these same variables on recidivism ten years post-release date (see Table 4). Again, the variables were entered into the regression in one step with time to first offense post-release as the time variable. The status variable this time was whether the participant had a sexual offense within ten years. The overall model was significant, Chi Square(6) = 58.81, $p <$ .001. Again, the only significantly associated variable was multiple victims. For the ten-year model as well, having multiple victims increased the hazard of recidivism.

b. Criminality marker: 5 and 10 years post-release date. To investigate sexual recidivism rates based on past criminality, as measured by parole violations (yes/no), prison terms (1-2, 2-3, 4 or more) and juvenile offenses (yes/no) prior to 1989/90, a Cox regression was performed with the covariates entered in one step. The time variable was

the time in years until the first sexual offense after the release date. Censored cases were those participants who did not re-offend within five years. The overall model was significant, Chi Square (3) 48.81, $p < .001$. Both prison terms and parole violations were significant and positive, which indicate that both of these covariates increase the hazard of recidivism within five years. The hazard ratios for these covariates indicate that someone who had violated parole prior to their release date was almost six times more likely to have a sexual offense after their release date than someone who had no parole violations, Exp(B) = 5.87 (see Table 5).

Next, we looked at how these criminality covariates were associated with recidivism at the 10-year mark. Again, the covariates were entered into the regression in one step with time to first sexual offense post-release as the time variable. The status variable was now whether the participant had a sexual offense post-release date within 10 years. The overall model was significant, Chi Square (3) = 45.83, $p < .001$. The regression coefficients for parole violations and prison terms were positive and significant, indicating that these covariates were associated with a higher hazard of recidivism at the 10-year mark (see Table 5).

c. Aggression marker: 5 and 10 years post-release. A Cox regression was performed to examine whether severe aggression had an effect on recidivism at the five-year mark. The covariates used to measure aggression were at least one episode of stabbing, beating, maiming, or strangulation prior to the 1989/90 release date (yes/no) and the group 1 violence score from the first sexual offense. The covariates were entered into the regression in one step with time to first sexual offense post release as the time variable. The status variable was whether the participant had a sexual offense within five

years from the release date. Neither covariate was significant in the regression and the overall model was not significant.

We then performed a Cox regression at the 10-year mark using the same covariates and the model was again non-significant and the covariates were not significant. Further, a correlation analysis between aggressiveness in the first sexual offense (sum of any stabbing, beating, maiming or strangulation) and aggressiveness in subsequent sexual offenses was not significant ($r = .12$, $n = 137$).

d. Combining markers. We created a new scale in order to examine whether the predictive accuracy of the variables found previously to be associated with recidivism at the 5 and 10-year marks was improved when these variables were combined. The new scale combined the variables from the sexual deviance and criminality markers (all prior to the release date) that were significantly associated with recidivism (multiple types of victims, prior prison and parole violations). The new scale was created by summing over the three variables to create a range from 0 – 3 in theory; although, none of the participants in our sample had a score of 3. Receiver Operating Curves (ROC) were then created for the separate markers and for the combined scale using recidivism at the 5-year mark and the 10-year mark as the dependent variables. The ROC curve plots the specificity (false positives) and sensitivity (true positives) of the scale being studied. An area of 1.0 indicates a perfect prediction of true positives with no false positives and an area of .50 indicates prediction no better than chance. The advantage of using an ROC curve over other statistical measures of prediction (e.g., correlation coefficients) is that it is not constrained by base rates or selection ratios. Only the variables found to be significantly associated with recidivism in the Cox regressions were used for the ROC

curves; consequently, the ROC curve was created for multiple types of victims (sexual deviance) and another was created for prison and parole violations (criminality). As Table 6 illustrates, the area under the curve for the combined scale is higher than the other ROC curves, indicating better predictive accuracy. The correlation coefficients add further support for this finding.

Static 99 :

a. Sexual recidivism predictive accuracy. The average Static 99 score calculated at the 1989/90 release date was 4.28 for the sample, and was associated with a 31% rate of sexual recidivism at five-years post release and a 40% rate of sexual recidivism at 10+ years post release. The area under the ROC was used to measure the predictive accuracy of the Static 99 prior to the 1989/1990 release date, using recidivism at the 5-year mark and the 10-year mark as the dependent variables. The area under the ROC curve for the Static99 prior to 1989/1990 with recidivism at the 5-year mark and the 10-year mark were both .62 ($r=.24$, $p<.01$). The predictive accuracy for the ROC curve can be roughly compared to a grade point system, which indicates that the present ROC curve would score a "D"; in other words, the Static 99 score prior to the release date did not very accurately predict sexual recidivism at either the 5-year or 10-year mark

b. Static 99 sexual re-offense rates: comparison of pilot findings to normative data. Table 7 offers a comparison of rates of sexual offense associated with the five- and ten-year post-release mark from the pilot data compared to the Hanson and Thornton (10) developmental norms. Of the 45 subjects scoring in the low risk range (Static 99 scores of 2 and 3), our data revealed a higher incidence of sexual re-offending than the normative sample. Indeed, the 10-year sexual recidivism percentage for those scoring a 3 in our

sample was similar to that of the developmental sample score of 5, or a moderate high risk. Therefore, the Static 99 would have erroneously categorized the pilot subjects in 1989/90 as a low risk, when at the 10-year marker their sexual recidivism rate actually mirrored that of the developmental sample moderate-high risk offenders. Conversely, those categorized as a moderate-high risk at a score of 4 in the pilot sample demonstrated a low sexual re-offending at the five- and ten year-follow up periods. When compared to the developmental sample, the 10-year risk marker was considerably lower; that is, 17% versus the 31% found in the Hanson and Thornton study. For those scoring in the high-risk range, that of 6 (N=13), those in the pilot sample had a much lower rate of re-offense (15% at 10 years versus 45% by the norms) than that found in the developmental sample (the majority of whom were a 6 with very small numbers above that). At the highest level, scores of 7 or above, the Static 99 worked well. This points to some degree the instability of the Static 99 developmental norms in offering risk percentages for future sexual recidivism.

Discussion

Two specific issues were addressed by the pilot data: the identification of risk factors for sexual recidivism and the stability of the Static 99 in predicting sexual recidivism. Our base rate for sexual recidivism at the five-year mark was 31%, and for the 10-year mark it was 40%. We suspect that these rates were inflated as our sample consisted of those who were still under active CDCR supervision. That is, the study excluded those in which legal jurisdiction over the individual had expired during the investigation period of January 1989/90 to June 2002. Moreover, this base-rate remains

to be tested in the larger sample.

Risk Predictors: We found that combining the significant variables from two of the risk markers, sexual deviancy (multiple victim types) and criminality (parole violations and prison terms), led to a moderate level of predictive accuracy for sexual recidivism (ROC of .71, r=.42 at five years follow-up, r=.46 at ten years follow-up). An avenue for improving upon the moderate predictive accuracy associated with existing sex offender risk scales might be to weight those variables that tap strongly into sexual deviancy (9). Multiple victim type appeared to serve as a good proxy for sexual deviance; however, this definition is not meant to convey that those with one specific victim type (e.g., exclusive homosexual pedophilia) would not be considered sexually deviant.

The criminality marker was significant for both prison terms and parole violations as increasing the risk for sexual recidivism. The hazard ratios indicated that someone who violated parole prior to their release date was almost six times more likely to have a sexual offense after their release date at both the five-and ten-year-follow-up periods than someone who had no parole violations. This is consistent with the Hanson and Morton-Bourgon (9) meta-analysis where prior failure on conditional release was a moderate predictor of sexual recidivism, and was statistically similar to using the Static 99, RRASOR, or MnSost-R in terms of predictive accuracy. However, general criminality, as measured by number of prison terms, pointed to an antisocial element as raising the risk for sexual re-offense. These preliminary data suggest that acts of sexual offending associated with an antisocial or criminal bent may be as persistent as those driven by more apparent sexual deviancy. This finding is in contrast to the Hanson and Morton-

Bourgon meta-analysis where variables associated with general criminal history had small or no associations to sexual recidivism (9).

The aggression marker was not predictive of sexual recidivism. Our findings did not support the use of violence towards victims as a risk predictor in actuarial schemes. This is consistent with the Hanson and Morton-Bourgon (9) meta-analysis.

Overall, our marker analysis identified sexual deviancy and criminality as two primary risk factors for sexual re-offending and was consistent with that described by Roberts, Doren and Thornton (34). Our data provided preliminary support for a cumulative effect increasing risk; i.e., when both sexual deviancy and criminality factors are present. However, our sample size was small and cross-validation on a larger sample would be required before our "three-item" scale could be used as an actuarial tool. Psychopathy may increase the risk of sexual recidivism (17, 39, 41). In this regard, the PCL-R (42) would have been useful in addressing this issue, but the prison files did not contain such scores and there was insufficient information from the file review to generate a PCL-R score. In addition, while physiological ratings, such as PPG, would have been useful, this was not a procedure conducted in the prison system. Moreover, both ratings singly offer only small associations to sexual recidivism as concluded by a recent large-scale meta-analysis (9).

Static 99: Our preliminary data suggest that Static 99 scores might pose a risk of both underestimating and overestimating risk. The average Static 99 score calculated at the 1989/90-release date was 4.28 for the sample. However, the Static 99 ROC was at .62 for the 5 and 10-year markers, lower than the .71 cited in the normative study (10). This value suggests that the Static 99 was not a very accurate predictor of sexual recidivism in

our sample.

The risk for false positives and false negatives related to the Static 99 has been raised by prior researchers (43). Some, however, argue that the concept of false positives and negatives was more relevant to the notion of "prediction" versus risk assessment. A related concept that has utility for applied risk assessments is examining the stability of the risk percentages identified in the Static 99 developmental sample (44). Doren (44) cited a lack of stability for a Static 99 score of four for the five-year rates when aggregated data from seven studies had much lower recidivism rates when compared to the Static-99 developmental study score (12.9% versus 25.8%). In our sample, those in moderate low risk by the Static 99 scores (i.e., 2, 3) at the time of their release in 1989/90 had higher rates of sexual re-offense at the five and ten-year mark then in the developmental sample. Those categorized as a moderate to high risk by the Static 99 (score of 4,6) demonstrated relatively lower rates of sexual re-offending than the developmental sample at the follow up periods.

Abracen and Looman (45) and Looman (46)demonstrated lower rates of sexual recidivism at the five-year marker among Canadian moderate and high-risk sex offenders as identified by the Static 99 than the Hanson and Thornton (10) developmental sample. Both articles reported data on overlapping samples of Canadian sex offenders undergoing treatment. When examining the full sample of 258 sex offenders followed over a 5.1 year period, Looman (46) found the Static 99 AUC value of .62 for predicting sexual recidivism. This was similar to that found in our study. The overall incidence of sexual recidivism was low (8.9%) both in the Looman report and in the Abracen and Looman data (13.3%), and may be related to the use of sexual convictions as the outcome

variable. Abracen and Looman reported the observed rate of sexual recidivism for those scoring a Static 99 of 5 as 12.7%, markedly lower than the 33% cited in the developmental study. Moreover, even for a Static 99 score of 6, the observed sexual recidivism rate was low, that of 10.8% in contrast with the 39% value cited by Hanson and Thornton (10). Within the context of applied risk assessments, these data challenge the use of the Hanson and Thornton developmental recidivism percentages by which to rank the risk of sex offenders.

Regional differences in how sexual offenses are tried and sentenced as well as offender characteristics (racial diversity) might be elements in the lack of correspondence between the Static 99 risk percentages in our pilot data when compared to the developmental sample. With respect to jurisdictional differences in sexual recidivism rates, our data demonstrated higher, but not substantially so, findings when time-period of follow-up and outcome measures were controlled. For example, the rate of sexual arrest in the mid-west Mn-SOST-R cross-validation sample was 22% in six years (7) compared to our five-year sexual recidivism rate of 31%. Moreover, the survival distribution of multiple-occasion sex offenders from the first to the second sexual offense in our data did not differ when compared to other samples. At the five-year point, almost one-half of those with multiple sexual offending in our sample had committed their second sex offense. By the 10-year point, an additional 11 had re-offended. These data are consistent with those found by Doren (40) and Prentky, Janus, and Seto (47) where one-half of all detected sexual recidivism was found within the first five-years post release, and about two-thirds to three-quarters of the detected sexual recidivism found by 10- years post-release. Whether there are jurisdiction specific sexual recidivism rates

remains to be determined by a larger sample as our data are limited in scope, both by the small sample size and selection of only "active files".

A recent Swedish study found that the accuracy of the RRASOR and Static 99 varied across ethnicity (48). While the tools were accurate for those prisoners of Nordic and non-Nordic European descent in the prediction of sexual recidivism, neither actuarial tool could differentiate accurately African or Asian sexual recidivists from non-sexual recidivists. Our pilot data provided some support for the use of the Static 99 among ethnically diverse sex offenders, in that the predictive statistical value was above chance (ROC=.62, r=.24); the strength of association, however, was clearly lower than that found in the developmental sample. This may be related to diversity contributed by juridisditional differences in the prosecution of sexual offenses, as well as cultural and ethnic/racial variations from Canadian or U.K. groups.

Conclusions: We found that three variables-multiple victim types, parole failures, and prior prison terms cumulatively predicted sexual recidivism at a moderate level of accuracy. The Static 99 statistical predictive accuracy in our sample was lower than that reported in the developmental sample. In addition, the Static 99 either underestimated or overestimated risk in our sample. The use of the Static 99 in many U.S. jurisdictions to rank the risk level of sex offenders facing SVP/SDP commitment may be problematic given the failure to replicate the developmental norms.

There are inherent limitations in a pilot report. Notably, this study's sample selection used only active prison files. This sampling, as mentioned previously, may have inflated the rate of sexual recidivism. Consequently, these findings are not descriptive of the entire sample pool; nonetheless, they may be instructive as to risk

factors that emerge as robust in predicting sexual recidivism among long-term offenders who have returned to corrections' supervision after community release. In addition, the small sample size coupled with missing data limited the dynamic variables that were available for preliminary analysis. Increasingly, investigators have emphasized the need to include dynamic variables and a broadening of outcomes that measure change in the inclusion of risk schemes (49-51). Dynamic risk factors in a larger sample may add cumulatively to the predictive accuracy of the combination variables from two markers identified currently.

Sjostedt and Grann (52) urged researchers to develop validity estimates for better conceptualized outcome measures than the generic category of "sexual recidivist." The task of developing specific risk characteristics that can be finely tuned to distinguish recalcitrant repeat offenders from those who are "moderate risk" sexual recidivists is more difficult than differentiating broadly between single-offense sex offenders and multiple-offense sex offenders. Relatedly, Sjostedt and Grann found in their application of existing actuarial procedures to a Swedish database that such procedures were useful in identifying imminent and less severe re-offending, but were less accurate in distinguishing who will commit repeat and injurious sexual offenses. These researchers noted that existing actuarial methods are optimized to predict the most common but least severe sex offenses. Further identification of the characteristics of severe and persistently re-offending group would be useful in both risk assessment decisions as well as management during community release.

One rating scale is unlikely to be able to address risk across an offender's lifetime as well as encompass person-specific factors. Actuarial tables may be one method with

which to develop an individual specific "algorithm" of risk as in evidence based medicine (33). Ultimately, actuarial tools describe group patterns, and the fit to an individual requires a complex analysis beyond a rating scale.

References

1. Sreenivasan S, Weinberger LE, Garrick T: Expert testimony in sexually violent predator commitments: Conceptualizing legal standards of "mental disorder" and "likely to reoffend." Journal of the American Academy of Psychiatry and the Law 31:471-85, 2003

2. Sreenivasan S, Kirkish P, Garrick T, Weinberger LE, Phenix A: Actuarial risk assessment models: A review of critical issues related to violence and sex offender recidivism assessments. Journal of the American Academy of Psychiatry and the Law 28:438-48, 2000

3. Hanson RK: The development of a brief actuarial scale for sexual offense recidivism. Ontario, Canada: Department of the Solicitor General of Canada, 1997

4. Hanson RK, Bussiere MT: Predicting relapse: a meta-analysis of sexual offender recidivism studies. Journal of Consulting and Clinical Psychology 66:348-62,1998

5. Hanson RK: What do we know about sex offender risk assessment? Psychology, Public Policy, and the Law 4:50-72, 1998

6. Hanson RK: The development of a brief actuarial rating scale for sexual offense recidivism. Ottawa, Canada: Department of the Solicitor General of Canada, 1997

7. Epperson DL, Kaul JD, Goldman R, Huot SJ, Heselton D, Alexander W: Minnesota sex offender screening tool revised (Mnsost-R). http://www.psychology.iastate.edu/faculty/epperson/MnSOST-RScoring11-16-2004.pdf, 2004

8. Harris GT, Rice ME: Actuarial assessment of risk among sex offenders. New York: Annals of the New York Academy of Sciences, 2003

9. Hanson RK, Morton-Bourgon K:E. The characteristics of persistent sexual offenders: A meta-analysis of recidivism studies. Journal of Consulting and Clinical Psychology 73: 1154-1163, 2005

10. Hanson RK, Thornton D: Improving risk assessment of sex offenders: A comparison of three actuarial scales. Law and Human Behavior 24:119-36, 2000

11. Quinsey VL, Harris GT, Rice ME, Cormier LA: Violent offenders: appraising and managing risk. Washington, DC: American Psychological Association, 1998

12. California Department of Mental Health: Clinical Evaluator Handbook and Standardized Assessment Protocol. Sacramento, CA: California Department of Mental Health, 2004

13. Rogers R: The uncritical acceptance of risk assessment in forensic practice. Law and Human Behavior 24:595-605, 2000

14. Berlin FS, Galbreath NW, Geary B, McGlone G: The use of actuarials at civil commitment hearings to predict the likelihood of future sexual violence. Sexual Abuse: Journal of Research & Treatment 15:377-82, 2003

15. Grubin D: Sex offending against children: Understanding the risk. Edited by Series PR. London: London Home Office, 1998

16. Barbaree HE, Seto MC, Langton CM, Peacock EJ: Evaluating the predictive accuracy of six risk assessment instruments for adult sex offenders. Criminal Justice and Behavior 28:490-521, 2001

17. Harris GT, Rice ME, Quinsey VL, Lalumière ML, Boer D, Lang C: A multisite comparison of actuarial risk instruments for sex offenders. Psychological Assessment 15:413-425, 2003

18. McGrath RJ, Cumming G, Livingston JA, Hoke SE: The Vermont Treatment Program for Sexual Aggressors: An evaluation of a prison-based treatment program. Presented at the Annual Conference of the Association for the Treatment of Sexual Abusers, San Diego, CA, 2000

19. Nunes KL, Firestone P, Bradford JM, Greenberg DM, Broom I: A comparison of modified versions of the Static-99 and the Sex Offender Risk Appraisal Guide (SORAG). Sexual Abuse: A Journal of Research and Treatment 14:253-269, 2002

20. Sjöstedt G, Långström N: Actuarial assessment of sex offender recidivism risk: A cross validation of the RRASOR and the Static-99 in Sweden. Law and Human Behaviour 25:629-645, 2001

21. Hanson RK, Thornton D: Static-99: Improving actuarial risk assessments for sex offenders. Ontario, Canada: Department of the Solicitor General of Canada, 1999

22. Hood R, Shute S, Feilzer M, Wilcox A: Reconviction rates of serious sex offenders and assessments of their risk. London: IUHO, 2002

23. Nicholaichuk T: The comparison of two standardized risk assessment instruments in a sample of Canadian aboriginal sexual offenders. Presented at the Annual

Conference of the Association for the Treatment of Sexual Abusers, San Antonio, Texas, 2001

24. Poole D, Liedecke D, Marbibi M: Risk assessment and recidivism in juvenile sexual offenders: A validation study of the Static-99., Texas Youth Commission monograph, 2000

25. Tough SE: Validation of Two Standardized Risk Assessments (RRASOR, 1997; Static-99, 1999) on a Sample of Adult Males who are Developmentally Disabled with Significant Cognitive Deficits. Toronto, Canada: University of Toronto, 2001

26. Wilson RJ, Prinzo M: The concurrent validity of actuarial measures of sexual and violent risk in high-risk sexual offenders detained until sentence completion. Presented at the Annual Conference of the Association for the Treatment of Sexual Abusers. San Antonio, Texas, 2001

27. Hanson RK: Notes on the Reliability of Static-99 as Used by the California Department of Mental Health Evaluators. Edited by the California Department of Mental Health, Sacramento, CA: California Department of Mental Health, 2001

28. Doren DM: Stability of interpretive risk percentages for the RRASOR and Static-99 across samples. Presented at the Annual Conference of the Association for the for the Treatment of Sexual Abusers. Montreal, Quebec, Canada, 2002

29. Greenfeld LA: Sex Offenses and offenders: An analysis of Data on Rape and Sexual Assault. Washington, DC: U.S. Department of Justice, 1997

30. Falshaw L, Bates A, Patel V, Corbett C, Friendship C: Assessing reconviction, reoffending and recidivism in a sample of UK sexual offenders. Legal and Criminologic Psychology 8:207-215, 2003

31. Rennison CM: Rape and Sexual Assault: Reporting to Police and Medical Attention, 1992-2000. Washington, DC: U.S. Department of Justice, 2002

32. Hanson RK, Morton KE, Harris A: Sex Offender Recidivism Risk: What We Know and What We Need to Know. Ottawa, Canada: Department of the Solicitor General of Canada, 2002

33. Braitman LE, Davidkoff F: Predicting clinical states in individual patients. Annals of Internal Medicine 125:406-12, 1996

34. Roberts E, Doren D, Thornton D: Dimensions associated with assessments of sex offender recidivism risk. Criminal Justice and Behavior 29:569-589, 2002

35. Barbaree H, Langton C, Peacock E: The factor structure of static actuarial items: Its relation to prediction. Sexual Abuse: A Journal of Research and Treatment. In press

36. Harris AJR, Phenix A, Hanson RK, Thornton D: Revised Coding Rules for the Static-99, Ottawa, Canada: Department of the Solicitor General of Canada, 2003

37. Boer DP, Wilson RJ, Gauthier CM, et al.: (Eds): Assessing Risk for Sexual Violence: Guidelines for Clinical Practice. New York: Guilford, 1997

38. Hanson RK, Harris AJ: A structured approach to evaluating change among sexual offenders. Sexual Abuse: A Journal of Research and Treatment 13:105-22, 2001

39. Rice M, Harris G: Risk appraisal and management of violent behavior. Psychiatric Services 48:1168-1176, 1997

40. Doren DM: Recidivism base rates, predictions of sex offender recidivism, and the "sexual predator" commitment laws. Behavioral Sciences and the Law 16:97-114, 1998

41. Hildebrand MC, de Vogel V: Psychopathy and sexual deviance in treated rapists. Sexual Abuse: A Journal of Research and Treatment 16:1-24, 2004

42. Hare RD: The Hare Psychopathy Checklist-Revised (PCL-R): Technical Manual. North Tonawanda, NY:Multi-Health Systems, 2003

43. Sjostedt G, Langstrom N: Actuarial assessment of sex offender recidivism risk: A cross-validation of the RRASOR and the Static-99 in Sweden. Law and Human Behavior 25:629-45, 2001

44. Doren DM: Stability of the interpretative risk percentages for the RRASOR and Static-99. Sexual Abuse: A Journal of Research and Treatment 16:25-36, 2004

45. Abracen, J, Looman J: Evaluation of civil commitment criteria in a high-risk sample of sexual offenders. Journal of Sexual Offender Civil Commitment: Science and the Law 1:124-140, 2006

46. Looman J: Comparison of two risk assessment instruments for sexual offenders. Sexual Abuse: A Journal of Research and Treatment, online publication 18: 193-206, 2006

47. Prentky RA, Janus ES, Seto MC: Sexually Coercive Behavior: Understanding and Management. New York: Academy of Sciences, 2003

48. Langstrom N: Accuracy of actuarial procedures for assessment of sexual offender recidivism risk may vary across ethnicity. Sexual Abuse: A Journal of Research and Treatment 16:107-120, 2004

49. Beech AR, Friendship C, Erikson M, Hanson RK: Static and dynamic predictors of reconviction. Sexual Abuse: A Journal of Research and Treatment 14:156-167, 2002

50. Hanson RK, Harris A: The Sex Offender Need Assessment Rating: SONAR: A Method for Measuring Change in Risk Levels. Ottawa, Canada: Department of the Solicitor General, 2000

51. Thornton D: Constructing and testing a framework for dynamic risk assessment. Sexual Abuse: A Journal of Research and Treatment 14:139-53, 2002

52. Sjostedt G, Grann M: Risk assessment: What is being predicted by actuarial prediction instruments? International Journal of Forensic Mental Health 1:179-183, 2002

Table 1
Sexual Recidivism Markers

Item Number	Risk Factor Sexual Deviance	Codes	Score
1	Prior sex offenses (prior to 1989/90 release; number episodes of sex offending: arrest only, prison, jail, probation, parole violation, prison rules violation excluding consensual sex):	1= one prior sex offense 2= two prior sex offenses 3= three or more sex offenses	1 2 3
2	Unrelated victim- any (all sex offense information, charged/uncharged prior to 1989/90)?	No= 0 Yes= 1	0 1
3	Stranger victim- any (all sex offense information charged/uncharged prior to 1989/90)?	No= 0 Yes= 1	0 1
4	Multiple victim types? (2 or more victim types, child & adolescent, male & female, etc.; for any of the sex offenses, charged/uncharged prior to 1989/90 release)	No= 0 Yes= 1	0 1
5	Number of total victims (charged and uncharged); greater than/equal to 3 (information prior to 1989/90 release)	No= 0 Yes= 1	0 1
6	Meets minimal time range Criteria A for DSM-IV paraphilia prior to 1989/90 release (at least six months of deviant sexual behavior)	No= 0 Yes= 1	0 1
Item Number	**Risk Factor Criminality**	**Codes**	**Score**
7	Number of prison terms (prior to 1989/90 release)	Low = 1 score a 0 Moderate= 2 to 3 score a 1 High= >/= 4 score a 2	0 1 2
8	More than one Parole violation (prior to 1989/90 release)	No= 0 Yes= 1	0 1
9	Juvenile delinquency	No= 0 Yes= 1	0 1
Item Number	**Risk Factor Aggression**	**Codes**	**Score**
10	Aggression towards sex offense victims (prior to 1989/90 release) Beating, maiming, strangulation and/or stabbing	No= 0 Yes= 1	0 1

Table 2
Demographic Characteristics and Criminal History of Pilot Sample

	Pilot Sample (N=137)
Race	
White	41 (30%)
Black	72 (53%)
Hispanic	21 (15%)
Native American	3 (2%)
Age at release in 1989/1990	
20-29	55 (40%)
30-39	64 (47%)
40-49	14 (10%)
50+	4 (3%)
Controlling offense in 1989/1990	
Sex offense	84 (61%)
Violent offense	10 (7%)
Parole violation	7 (5%)
Other offense	36 (26%)
Number of prison terms	
1	1 (1%)
2	36 (26%)
3	47 (34%)
4	22 (16%)
5+	31 (23%)

Table 3
Offender Characteristics at Time of First Sex Offense

	Pilot Sample (N=137)
Age	
< 20	37 (27%)
20-29	83 (61%)
30-39	16 (12%)
40-49	1 (1%)
Marital Status	
Single	90 (66%)
Married/cohabitating	22 (16%)
Divorced/widowed	4 (3%)
Unknown	21 (15%)
Employment	
Stable	12 (9%)
Unstable	42 (31%)
Unemployed	43 (31%)
Student	7 (5%)
Retired/disabled	2 (1%)
Unknown	31 (22%)
Total number of charges	
1	38 (28%)
2	45 (33%)
3 or more	51 (37%)
Unknown	3 (2%)
Convicted charges	
None	6 (4%)
1	59 (43%)
2	43 (31%)
3 or more	29 (21%)
Community Supervision status	
On parole or probation	4 (3%)

Table 4
Cox regression coefficients for Sexual Deviance Marker at 5 years after release

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
Stranger	.371	.421	.777	1	.378	1.449
No relation	1.214	.933	1.692	1	.193	3.367
Multiple types	2.090	.532	15.411	1	.000	8.087
3 or more victims	-1.023	1.068	.918	1	.338	.359
Prior sex offenses	.367	.494	.553	1	.457	1.444
Paraphilia	.123	.713	.030	1	.863	1.131

Cox regression coefficients for Sexual Deviance Marker at 10 years after release

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
Stranger	.008	.334	.001	1	.980	1.008
No relation	.475	.748	.403	1	.525	1.608
Multiple types	1.966	.464	17.949	1	.000	7.145
3 or more victims	-.604	.778	.603	1	.437	.547
Prior sex offenses	.510	.409	1.560	1	.212	1.666
Paraphilia	.496	.535	.860	1	.354	1.643

Table 5
Cox regression coefficients for Criminality Marker

At 5 years post-release

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
PRISON	.712	.285	6.244	1	.012	2.038
PAROLE	1.769	.551	10.313	1	.001	5.865
JUVENILE	-.718	.399	3.231	1	.072	.488

At 10+ years post-release

Variables in the Equation

	B	SE	Wald	df	Sig.	Exp(B)
PRISON	.720	.225	10.215	1	.001	2.054
PAROLE	1.443	.519	7.743	1	.005	4.234
JUVENILE	-.616	.323	3.635	1	.057	.540

Table 6
AUC Values for Sexual Recidivism using Significant Predictive Marker and Combined Variables

AUC for combinations		
Variables	Area under the curve	Correlation (r)
Multiple victim types alone		
5 years post release	.60	.29**
10 years post release	.60	.31**
Prison and Parole		
5 years post release	.66	.34**
10 years post release	.66	.37**
Multiple types, Prison and Parole		
5 years post release	.71	.42**
10 years post release	.71	.46**

**$p < .001$

Table 7

Static 99 Scores and Sexual Recidivism at 5 and 10 years in Pilot Sample Compared to Developmental Sample

Static 99 Score	Sample size	Pilot Study Sexual re-offense rates 5 year	10 year	Hanson and Thornton Static 99 Sexual re-offense rates 5 years	10 years
0	2(1.5%)	0	0	.05	.11
1	1(0.7%)	0	0	.06	.07
2	17(12.4%)	.12	.18	.09	.13
3	28(20.4%)	.21	.36	.12	.14
4	36(26.3%)	.03	.17	.26	.31
5	24(17.5%)	.21	.33	.33	.38
6	13(9.5%)	.08	.15	.39*	.45*
7	7(5.1%)	.29	.71		
8	6(4.4%)	.67	.67		
9	2(1.5%)	.50	.50		
10	1(0.7%)	1.00	1.00		
Average 4.28	137(100%)	.31	.40		

*developmental norms for 6+