

Actuarial Prediction of Juvenile Recidivism: The Static Variables of the Juvenile Sex Offender Assessment Protocol-II (J-SOAP-II)

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[Sexual Offender Treatment, Volume 4 (2009), Issue 2]

Abstract

Sexual offending among youth retains a great deal of attention from public policy decision-makers in the juvenile justice system despite the low rate at which juveniles sexually reoffend. Within the judicial system, evaluators are faced with the challenge of answering questions from the court regarding sexual recidivism potential and corresponding treatment placements. Empirical investigations link empirically supported and promising risk factors to sexual reoffending among juveniles across several studies. However, there is little cumulative evidence for strong predictive strength among risk assessment tools for juvenile sexual recidivism. We found the static variables of the Juvenile Sex Offender Assessment Protocol-II to have strong predictive accuracy for sexual recidivism (AUC=.75) among 7 sexual recidivists in a sample of 96 juvenile sex offenders. The J-SOAP-II was a poor predictor for non-sexual violent recidivism and non-sexual general recidivism. Additionally, we found that the predictive accuracy of the J-SOAP-II is stronger for the sex drive/preoccupation scale (AUC=.72) than the impulsive/anti-social behavior scale (AUC=.64). These data provide preliminary evidence for the predictive validity of the J-SOAP-II and indicate much of the predictive power is due to the measure of sexual drive rather than impulsivity.

Key words: risk assessment, juvenile sex offender, adolescent, recidivism, J-SOAP-II

Juvenile sex offenders constitute a small, but not insignificant proportion of sexual crimes committed in the United States. Uniform Crime Report provides data for forcible rape and all other sex offenses. In 2002, juveniles (under the age of 18) accounted for 16.7% of all forcible rapes and 20.6% of all other sex offenses. Although these figures remained stable from the previous 10 years, the 2007 Unified Crime Report (FBI, 2007) revealed a slight decrease in the proportion of sex crimes committed by persons under the age of 18; 11.3% of all forcible rapes and 13.8% of all other sex offenses.

In spite of these decreases, the concern about the risk that juvenile sex offenders pose to the community has not changed. Published recidivism statistics drawing data from state or national records consistently demonstrates non-sexual reoffending rates as being much higher than sexual reoffenses and low levels of sexual reoffending in JSO samples (e.g. Langstrom & Grann, 2000; Langstrom, 2002). These data also, have not influenced either public perception or public policy. In general, legislative initiatives have made few distinctions between those convicted of sexual crimes as adults and those adjudicated as sexual offenders as adolescents. In fact, most state sexually violent predator statutes allow for the commitment of juveniles (Frierson, Dwyer, Bell, & Williamson, 2008) and the recently enacted Adam Walsh Child Protection Act calls for lifetime registration and public notification for certain offenders as young as 14 years of age.

While many adult sex offenders may not have been charged for a sex offense in adolescence, it is reported that about 50% of all adult sex offenders disclose some form of sexually deviant behavior in adolescence (Abel, Mittleman, & Becker, 1995). Additionally, there are undoubtedly a small number of high risk juvenile sexual offenders who are likely to continue sexual offending behavior. Identifying predictable factors in these young sexual offenders and constructing an empirically guided and clinically adjusted assessment tool for sexual recidivism has been a serious challenge. While a recent review of the literature by Worling and Langstrom (2006) divided risk factors into empirically supported, promising, possible, and unlikely, their classification was based less on research with adolescents and more on research with adult populations. Letourneau and Miner (2005) have argued that application of adult findings to adolescent populations is unwarranted and problematic and Miner (2002) found that many adult risk factors were either unrelated to adolescent reoffending or behaved differently in adolescents than they did in adults.

The concern, no matter how unfounded, about the risks that juvenile sex offenders pose to the community and the application of community notification and registration statutes and civil commitment procedures to adolescents makes it imperative that statistical methods be developed to assess risk for reoffending in adolescent samples. Research has continually found that clinical judgment provides poor estimates of such potential, especially when the base rate is low (Grove & Meehl, 1996). Thus given the life changing implications of the decisions being made, the development of actuarial and guided clinical judgment procedures has been of profound importance to those working with juvenile sexual offenders. The four most widely used and researched tools for risk prediction in juvenile populations are described below.

Empirically Guided Risk Assessment Instruments

ERASOR. The Estimate of Risk of Adolescent Sexual Offenders (ERASOR) is an empirically guided risk assessment designed for youth ages 12-18 years of age. The scale consists of both static and dynamic risk factors. The goal in developing the ERASOR was to include dynamic variables that would address specialized treatment for juvenile sex offenders. There is one study that we were able to find which provided preliminary psychometric data. From this study, results conclude the ERASOR provides a short-term risk estimate that is no longer than one year (Worling, 2004). However, this study, nor any other that we have identified, has tested the predictive validity of the ERASOR. Worling (2004) found significant mean score differences between offenders with documented prior sex offenses and those without such documented offenses.

J-SORRAT-II (Juvenile Sexual Offense Recidivism Risk Assessment Tool-II). The J-SORRAT-II was developed in 1995 to assess for risk of violence among male juvenile offenders between the ages of 12-18 who had an index sexual offense (Epperson, Ralston, Fowers, & DeWitt, 2005). The 12-item tool includes variables based on predictors from a sample of 636 male youths adjudicated for sexual offenses (Epperson, et al, 2005). This initial investigation into the predictive validity of the J-SORRAT yielded an AUC of .89 for detecting the likelihood that a juvenile would sexually recidivate as a juvenile, that is prior to age 18 years. The 2005 study also indicated that the J-SORRAT-II produced an AUC of .79 for predicting the likelihood that a juvenile would sexually re-offend as a juvenile or adult (Epperson et al, 2005). However, a cross validation study found considerable shrinkage in predictive validity, with AUC of .65 and .66 (Ralston & Epperson, 2007).

Viljoen, Scalora, Cuadra, Bader, Chavez, Ullman, and Lawrence (2008) conducted predictive analyses using receiving operating characteristics for sexual and non-sexual re-offense behaviors both in treatment and post-discharge. Among the 169 total participants, 28 youth, or 16.6%, engaged in sexually aggressive behavior during treatment and 14 youth or 8.3% sexually

reoffended after completion of treatment. The J-SORRAT-II total score showed weak ability (AUC=.59) to predict in-treatment sexually aggressive behavior and the J-SORRAT-II total score predicted sexual re-offenses after completion of treatment no better than chance (AUC=.53). The time at risk for re-offenses in this study was 100.9 months.

SAVRY (Structured Assessment of Violence Risk in Youth). The SAVRY was developed to assess risk for violence in juveniles between the ages of 12 and 18. The items in this tool are based on the research linking adolescent development and youth violence. Strong predictive validity has been found when assessing general and violent recidivism (Meyers & Schmidt, 2008). The same study described above for the J-SORRAT-II also looked at the predictive validity of the SAVRY for sexual reoffending both during and post-treatment over a 100.9 month period (Viljoen et al, 2008). The SAVRY total score was no better than chance at predicting sexually aggressive behavior in treatment (AUC=.52) or at predicting sexual re-offenses (AUC=.53).

J-SOAP-II. The original version, the Juvenile Sex Offender Assessment Protocol (J-SOAP), was developed in 1994 at Joseph J. Peters Institute in Philadelphia (Prentky, Harris, Frizzell & Righthand, 2000). The empirically-informed scale was created to assess risk of sexual violence and general delinquency among male adolescent sex offenders (Prentky and Righthand, 1994). Prentky, et al, (2000) selected J-SOAP variables based on a review of the literature addressing clinical, etiological, and risk assessment studies of juvenile sex offenders. They also reviewed the literature on general criminal behavior in both juvenile and adult populations.

The J-SOAP tool included four scales measuring Sexual Drive/Preoccupation (Scale I), Impulsive/Antisocial Behavior (Scale II), Intervention (Scale III) and Community Stability/Adjustment (Scale IV). The Sexual Drive/Preoccupation Scale and the Impulsive/Antisocial Behavior Scale consist of static variables while the Intervention Scale and the Community Stability/Adjustment Scale are comprised of dynamic variables. The J-SOAP was revised in 1998 (still referred to as J-SOAP) based on a study of 153 juveniles in Maine (Righthand, Prentky, Hecker, Carpenter & Nangle, 2000). Scale reliability was examined using inter-rater reliability (2 raters) and internal consistency analysis. Inter-rater reliability ranged from .80 (Scale III) to .91 (Scale II). The results of this study showed high internal consistency for Scale II (Alpha = .88) and Scale IV (alpha = .80). Scale I evidenced moderate internal consistency (alpha = .64). Concurrent validity was examined by comparing correlations between the J-SOAP and the Youth - Level of Service/Case Management Inventory (Y-LSI/CMI), an adolescent risk assessment instrument. The results showed the Y-LSI/CMI to correlate highly with the J-SOAP ($r=.91$). In addition, the J-SOAP static scales (scales I and II) were compared to the criminal historical variables from subjects' files. Those variables were Sexual Offenses, Sexual Offense Victims, Total Offenses, and Sexual Aggression. Scale I showed significant correlation with Number of Sex Offenses ($r = .36$), Number of Sex Offense Victims ($r=.64$), and Degree of Sexual Aggression ($r=.27$). Scale II significantly correlated with Total Offenses ($r=.30$), Number of Sex Offense Victims ($r=.27$) and Degree of Sexual Aggression ($r=.29$).

The J-SOAP was revised again, re-titled J-SOAP-II (Prentky & Righthand, 2003) based on three validation studies (Hecker, Scoular, Righthand & Nangle, 2002; Waite, Pinderton, Wieckowski, McGarvey & Brown, 2002; Righthand, Knight & Prentky, 2002). Item additions and deletions were made to the four J-SOAP scales. Excellent inter-rater reliability has been detected for the J-SOAP-II total score (Viljoen, Scalora, Cuadra, Bader, Chavez, Ullman & Lawrence, 2008). According to our search of the literature, we found only a small selection of studies involving analysis for prediction of re-offense. Viljoen, et al. (2008) also conducted predictive analyses using receiving operating characteristics for sexual and non-sexual re-offense behaviors both in treatment and post-discharge. For the 26 youth, or 16.6% that engaged in sexually aggressive behavior during treatment, the J-SOAP-II total score showed weak predictive ability (AUC=.61). Compared to

post-treatment sexual re-offending for 14 youth or 8.3%, the J-SOAP-II total score predicted sexual re-offenses no better than chance ($AUC=.54$). The average length of time at risk for this study was 100.9 months. Martinez, Flores and Rosenfeld (2007) conducted a study of 60 Latino and African American male youth and found the J-SOAP-II demonstrated a high degree of accuracy among general and sexual recidivism ($ROC=.76$ and $ROC=.78$ respectively). These authors also reported that the J-SOAP-II dynamic scales were more predictive of recidivism than the static scales.

Current Study

The above literature indicates that none of the currently available tools shows consistently good predictive validity. It may be that like the process in the adult literature, it might be necessary to first determine the optimal static predictors of reoffending risk before incorporating dynamic and treatment related variables into the process of refining risk prediction (Harris & Hanson, 2003). Thus, in this study we attempted to identify predictive accuracy of the J-SOAP-II static variables. This focus on the static variables as a sound methodological approach to identifying unchangeable factors predictive of juvenile sexual recidivism is guided by the fact that research has yet to identify a system of dynamic risk variables for juvenile sex offenders and the success of risk assessment tools based on static factors in adult sexual offending samples. We have chosen to focus on the J-SOAP-II because it appears to have fostered the most empirical investigation, and appears to have attracted the most interest from the treatment community.

Method

Data for this project were obtained from an existing database (Miner, 2002; Miner, Peterson-Seikert & Acklund, 1997) and, thus, the methodology for participant selection, chart reviews and rater agreement for coding variables are the same as previously published in Miner (2002). However, they are duplicated in this section for the reader's information.

Participants

The study participants were 96 of 121 male residents of a corrections-based juvenile sex offender program in Minnesota admitted to treatment between March 10, 1993, and December 27, 1995. (The remaining 25 had been released from treatment and parole, and thus, only a skeleton chart was available for data extraction.) To be admitted to the program, youths had to have been adjudicated Delinquent for some type of sexual offense and either failed a community-based residential sex offender-specific treatment program or been found to be unsuitable for such a program (e.g., too violent, poor cognitive skills, etc.). Individuals were released from the program after completion of their commitment time or on reaching the age of 19 years. The program had no mechanism for declining to admit an individual, for the premature termination of noninvolved individuals, or for youths to drop out of treatment. Thus, the 96 participants included in this study do not reflect a selection of youths admitted to treatment; rather, they reflect all youths for which both chart review and reoffending information was available.

The average age of the sample at admission to the treatment program was 17.2 years (range=14 to 19 years). The sample was predominantly Caucasian (72 percent, with 14 percent African American, 8 percent Hispanic, 3 percent Native American, and 1 Asian). The median full scale IQ was 88; 54 percent of the sample had been in special education classes, 60 percent had completed the ninth grade or less, and 83 percent had one or more prior penal commitments. Eighty-six percent of the sample reported having been victims of sexual abuse.

The average age at first criminal offense was 14.1 years (range=10-19 years). These offenders had an average of 1.5 prior sexual offenses (range = 0-7) and 0.7 prior nonsexual victim-involved offenses (range= 0 to 6). The participants were predominantly child molestation offenders. The average age of their victims was 8.8 years, and 64 percent had offended against children under 11 years old. Forty-one percent of the sample had at least 1 male victim. The average number of victims per offense was 1.4.

Procedures

Chart Reviews. Data were collected from a detailed review of institutional charts using a protocol adapted from the Massachusetts Treatment Center Coding Guide (Knight, Cerce, Martino, Carter, Schneider, Prentky, & Rosenberg, 1989) Records contained the results of all assessments conducted (both within the corrections system and by other sources), reports of institutional adjustment, police reports, court transcripts, and other legal information. In general, variables were coded from the specifics available in the charts using structured, detailed descriptions (see below). Variables were coded "unclear" if the available data were ambiguous or insufficient to reliably code the variable. If information was missing on a particular variable, the "at least" rule was applied. This requires using the known amount or number known, and the "other" rule that required specifying the response whenever an "other" category was provided.

Data were abstracted by 5 trained research assistants. Raters were trained using standard files and required to have at least 80% agreement on all variables before coding study charts. This standard does not account for chance agreement, which can be as high as 50% for dichotomous variables. Each file required approximately 4 hours to code.

Juvenile Sex Offender Assessment Protocol-II (Prentky & Righthand, 2003). This study focuses on the two static scales: Scale I (Sexual Drive/Preoccupation Scale) and Scale II (Impulsive, Antisocial Behavior Scale). Table 1 presents the items that make up these two scales.

As noted above, data used in this study were abstracted from treatment records as part of an evaluation of sex offender treatment (Miner, et al., 1997). Using the automated database from that study, we constructed syntax that coded each J-SOAP-II variable and computed scores for Scale 1, Scale 2, and a total J-SOAP-II score.

Table 1: Items for J_SOAP_II Scales I and II

Scale 1: Sexual Drive/Preoccupation	Scale 2: Impulsive, Antisocial Behavior
Prior legally charged sex offenses	Caregiver consistency
Number of sexual abuse victims	Pervasive anger
Male child victim	School behavior problems
Duration of sex offense history	History of conduct disorder before age 10
Degree of planning in sexual offense(s)	Juvenile antisocial
Sexualized aggression	
Sexual drive and preoccupation	
Sexual victimization history	

behavior (age 10-17)
 Ever
 charged/arrested
 before age 16
 Multiple types of
 offenses
 Physical assault
 history and/or
 exposure to family
 violence

Sources of Reoffense Data

In this study, we defined recidivism as an arrest, conviction, or parole violation resulting from any type of new criminal behavior. This definition does not include technical violations of parole (e.g., absconding from placement, failure to comply with treatment, etc.). Recidivism data were collected as part of Miner (2002) and came from two automated databases, one maintained by the Minnesota State Bureau of Criminal Apprehension (BCA) and the other by the Minnesota Department of Corrections (MNDOC); augmented by data obtain from parole files maintained by MNDOC. These data sources were chosen to provide the most detailed descriptions possible for each criminal activity, as well as to insure that data were available for criminal activities outside of Minnesota.

Bureau of Criminal Apprehension Automated Database. The BCA maintains an automated database that includes arrests and dispositions for felonies and gross misdemeanors for adults apprehended in the state of Minnesota. This database provided information on the date of arrest, the charges for which an individual was arrested, and the disposition for each charge. This database is also linked to the United States Federal Bureau of Investigation's Uniform Crime Reporting System, which provides similar data for most States, thus allowing for identification of offenses that occur outside of Minnesota.

Department of Corrections Automated Database. The MNDOC maintains an automated database of admissions to its facilities and assignments to probation in non-Community Corrections counties. This database provided information on re-admissions to MNDOC facilities (both adult and juvenile) for new crimes and technical violations of parole.

Office of Juvenile Release Files. The MNDOC Office of Juvenile Release maintains central files of all youths released from MNDOC facilities. These files document a range of information, including the setting into which a youth was released, the discharge plan, adjustment reports, and reports of any adverse actions. In our review, we were interested in the adjustment reports and reports of any adverse actions, which describe any parole violations or new charges.

Data Aggregation. Data were aggregated across the three sources of information. All incidents reported on the BCA and MNDOC databases were first cross-referenced to insure that duplicate data were removed (so that only discrete events were included in our analysis). Additionally, information available from the Office of Juvenile Release files was used to supplement the automated data by adding incidents that failed to show up on either automated database and to clarify the nature of offenses that were identified through the MNDOC database. The analyses presented in this report, therefore, are based on the most discrete categorizations of behavior that we could obtain. We acknowledge that our reliance on officially reported behavior may underestimate the recidivism rate in our sample.

Statistical Analysis. Data were analyzed using the Receiver Operating Characteristic (ROC) analysis and the areas under the curve (AUCs) with 95% accuracy. The ROC has advantages over other commonly used measures of predictive accuracy or selection ratios because of its accuracy to achieve specificity and sensitivity. Specificity refers to the ability of a test to identify those subjects who do not have the disorder (behavior) in question. Sensitivity refers to the ability of a test to identify those with the disorder (behavior). Further, Receiver Operating Characteristics is a measure of predictive accuracy which plots the hits (accurately identified recidivists) and false alarms at each level of the risk scale. The ROC is also not constrained by base rates (Hanson & Thornton, 2000). The ROC analysis is the most appropriate statistical procedure to use in this predictive study due to the low base rate in this population and low number of sexual recidivists (n=7). The ROC provides an estimate of recidivism within a compensatory relationship among four probabilities (false positive, false negative, true positive, true negative). The ROC analysis produces an Area Under the Curve (AUC) which plots the sensitivity of a tool against its specificity. The AUC ranges from 0 to 1, indicating the probability that a randomly selected recidivist would score higher on the J-SOAP-II than a randomly selected non-recidivist. The sample includes differential times at risk (the average for this sample was 4.29 years, ranging from a few months to 6.5 years). We also consider the time at risk of 4.29 years to be an appropriate factor in our methodological design. With the exception of the HCR-20 (Historical, Clinical, Risk Management - 20), risk assessment tools generally are tested for time frames between 3 and 10 years (Static-99, RRASOR, VRAG, SORAG, MnSOST-R).

Three separate analyses were run using the ROC combining Scale I (Sexual Drive/Preoccupation) and Scale II (Impulsive/Antisocial Behavior). The ROC's AUC was provided for sexual recidivism (n=7), non-sexual general violent recidivism (n=15), and general non-violent recidivism (n=25). Separate ROC analyses were run on Scale I and Scale II for sexual recidivism. Scales III and IV pertain to dynamic risk variables that were not analyzed in this study.

Results

Table 2 presents the AUCs and 95% confidence intervals for each of the analyses. The AUC for the sexual recidivist group (n=7) was .75, demonstrating strong accuracy. Results are also provided for two separate analyses: an AUC including non-sexual violent re-offenses and a separate analysis including non-violent re-offenses. The results for both non-sexual violent re-offense (AUC = .57) and non-violent re-offense (AUC = .45) were essentially no better than chance.

To determine any differences in predictive strength between scale I and scale II, ROC analyses were conducted on each scale for the sexual recidivism variable. Figure 2 demonstrates scale I has good predictive accuracy (AUC=.72) and Scale II has adequate predictive accuracy (AUC=.64).

Table 2: AUC Values for the J-SOAP-II Scales for the Sample

J-SOAP-II Scales	Type of Recidivism					
	Sexual		Non-sexual Violent		Non-Violent	
	AUC	95% CI	AUC	95% CI	AUC	95% CI
J-SOAP-II Static Total	.75	.64 to .96	.57	.41 to .74	.45	.31 to .58

Sexual Drive/Preoccupation	.72	.47 to .96	.46	.29 to .62	.41	.27 to .55
Impulsive/Antisocial	.64	.38 to .89	.64	.48 to .79	.47	.34 to .60

Note. AUC = area under the curve; CI = confidence interval; J-SOAP-II = Juvenile Sex Offender Assessment Protocol-II. AUC values calculated for the J-SOAP-II Static Total Score, Sexual Drive/Preoccupation Scale and Impulsive/Antisocial Scale using N=96.

- a. Sexual recidivism refers to a new arrest, conviction or parole violation for a new sexual offense.
- b. Non-sexual Violent recidivism refers to a new arrest, conviction or parole violation for a new non-sexual, violent offense.
- c. Non-violent recidivism refers to a new arrest, conviction or parole violation for a new non-sexual and non-violent criminal offense.

Discussion

The results of the J-SOAP-II static variables suggest good prediction ability for sexual recidivists among a group of adolescent sexual offenders, in spite of the small number of reoffenders. These results indicate that static variables, in isolation of intervention and community stability/adjustment items, predict sexual recidivism in juveniles with high accuracy for the duration of an average of 4.29 years. The total score of the static variables is equal to 32 points, while the dynamic variables (scales III and IV) totals 24 points. Thus, the majority of the J-SOAP-II items are committed to static variables. Among the static scales, we discovered that those measuring sexual deviance and/or preoccupation (Scale I) predicted sexual recidivism better than those static variables measuring impulsive/anti-social behavior (Scale II).

Our conclusions are tempered by the limitations of this study. The study used an existing database that included variables abstracted from clinical records using a coding dictionary that was not designed for scoring the J-SOAP-II. The authors wrote a scoring algorithm to score the J-SOAP-II for each subject, thus an inter-rater reliability test was not conducted. However, other authors have conducted previous inter-rater reliability analysis of the J-SOAP-II with strong outcomes (e.g. Martinez, Flores & Rosenfeld, 2007) demonstrating that, in our opinion, the J-SOAP-II is easy to score. Secondly, we deviated from the J-SOAP-II manual in order to score the sexual victimization history item. There was no way to code penetration in our scoring algorithm due to differing definitions of our coding manual. In our file review coding guide, a victim of sexual assault is identified as there being any kind of reference to sexual victimization and/or if the subject's partner was more than one developmental stage older than the subject. The J-SOAP-II scoring criteria for sexual victimization history required evidence of any form of penetration or physical injury to the juvenile. Secondly, we did not analyze detection of recidivism at time of offense in order to suggest categorical bins to determine levels of risk. Survival tests determine how long an offender "survives" until re-offending again. Third, there are several developmental differences that occur throughout the adolescent age span. Running separate analysis by age categories would be a contribution to studies on risk assessment tools. Our analyses of sexual recidivism are based on 7 re-offenders (mean age = 16.9). While ROC analyses are appropriate for low prevalence events, the small number of reoffenders may result in spurious associations. Notably, the predictive validity in our study is limited to the age ranges of the recidivists and may not be representative of the entire juvenile age range (e.g. ages 13-21). Finally, we propose that users of the J-SOAP-II should refrain from relying solely on J-SOAP-II scores to classify juvenile assessment subjects with a risk appraisal until cumulative research with more subjects is published.

Ethical concerns surrounding juvenile risk assessment evaluations attempts to balance knowledge of adolescent sexual behavior, cognitive development/impulse control, and deviant dispositions that sensitively distinguish youths from adults. While there are many promising and possible risk factors of sexual reoffending, there is empirical support for only a few factors in the literature for sexual reoffending. These include non-completion of an offense-specific treatment program (Borduin, Henggeler, Blaske, & Stein, 1990; Worling & Curwen, 2000), stranger victims (Smith & Monastersky, 1986; Langstrom, 2002), multiple victims (Langstrom, 2002), at least one prior sanction for criminal sexual conduct (Langstrom, 2002) and social isolation (Langstrom & Grann, 2000). However, even these factors do not have consistent empirical support. Additionally, while self-reported deviant sexual interests in youth has been an empirically supported risk factor for subsequent juvenile sexual reoffenses (Worling & Curwen, 2000), empirical support is lacking in the juvenile research for deviance measured by Penile Plethysmograph results or other objective measures. A great deal of continued research is needed to add not only to the construction of static variables for a risk assessment tool, but to continue identifying dynamic risk variables linked to sexual recidivism in youth.


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