

Actuarial Risk Assessment with Juveniles Who Offend Sexually: Development of the Juvenile Sexual Offense Recidivism Risk Assessment Tool-II (JSORRAT-II)^a

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**Actuarial Risk Assessment with Juveniles Who Offend Sexually:
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Tool-II (JSORRAT-II)**

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The general public has demonstrated increasing concern about sexual violence in their communities over the past 15 years. This apprehension has focused more and more on the danger posed by sexual offenders released into the community who subsequently perpetrate additional sexual offenses (repeat offenders). The public's anxiety is reflected in numerous legislative mandates for more effective risk management techniques to reduce the threat to public safety posed by known sexual offenders released to the community. In addition, state and federal governments have enacted registration and community notification statutes for convicted sexual offenders, and sixteen states have passed laws that enable the state to commit high risk sexual offenders to forensic hospitals instead of releasing them into the community at the end of their prison sentences (Doren, 2002; Lieb & Goodkin, 2005).

To understand the role of effective risk management, it is important to first clarify the key concepts of *risk*, *risk management*, *danger or threat* to the community, and *risk reduction*. In our model, *risk* is inherent in the individual; it is comprised of those individual characteristics that make an individual more or less likely to commit new sexual offenses in the future. Examples of such characteristics, or risk factors, would include the level of drive to engage in such acts, presence or absence of distorted sexual attitudes, quality of judgment and/or impulse control, and degree of psychopathy. Risk, as the composite of risk factors, can be operationalized as the offender's likelihood of committing additional sexual offenses if released

into the community with no external constraints placed on his or her behavior (see the dotted line in Figure 1).

Insert Figure 1 here

It is important to note that environmental factors are *not* considered to be risk factors under this conceptualization; instead, they are viewed as components of risk management. *Risk management* in our model includes all efforts external to the individual intended to reduce the *danger or threat to the public* relative to the level of risk presented by the individual. Examples of risk management include placement in supervised settings, increased individual supervision, and random testing for substance use. Operationally, the danger or threat to the community is the reduced likelihood, relative to risk, of an offender committing a new sexual offense given the level of risk management implemented. If there is no risk management or it is ineffectively applied, then the danger or threat to the public is equal to the risk of the individual. However, with effective risk management, the threat or danger to the public is reduced (see Figure 1).

There are two key implications of this conceptualization for risk assessment and risk management. The first is that the model specifies that risk is inherent in the individual and is unchanged by external constraints in the environment. These external constraints, so long as they remain in effect, reduce the danger or threat to the community by reducing the likelihood that the level of risk will manifest itself; however, risk remains unchanged because the individual remains unchanged. Second, the model emphasizes that although risk management components do not reduce risk, they should be *selected based on risk* to effectively reduce the public's exposure to danger. For example, it makes little sense to invest in intensive supervision for a

very low risk offender, particularly when resources are limited, which is an almost universal situation for departments of corrections, youth corrections, and public safety. Such a practice would waste precious resources on an individual whose threat to the public is already so low that it cannot be reduced much further. It also may actually increase the risk of that individual through contagion effects by exposing him or her to higher risk offenders (e.g., Gifford-Smith, Dodge, Dishion, & McCord, 2005). Additionally, such practices can unnecessarily deprive individuals of liberty interests by providing a more restrictive environment than is warranted without commensurate benefit to society.

Alternatively, a very high risk offender may require a significant investment in risk management efforts to substantially reduce the danger or threat to the community posed by this individual. To be effective, risk management requires that scarce resources be invested carefully by *matching* the level of risk management to the level of risk presented by the individual. Accurate assessment of risk, therefore, is absolutely critical for this necessary matching process to occur. The absence of risk assessment produces undifferentiated, “one size fits all,” risk management practices that are often too intense and costly for low risk offenders and insufficient to effectively reduce the danger to the public posed by high risk offenders. Inaccurate risk assessment produces mismatched, and therefore largely ineffective, risk management efforts.

As indicated in Figure 1, the empirical evaluation of risk management procedures, including legislatively mandated ones, is a second type of assessment that is central to effective risk management. Risk management procedures cannot simply be assumed to reduce danger or threat to the public; instead, we must evaluate them empirically to assess their effectiveness. If specific risk management components prove ineffective for particular levels of risk, then they should be discontinued and replaced with more promising procedures.

Although risk is inherent in the individual, it is not static, so danger or threat to the public can be reduced through risk reduction as well as through effective risk management. *Risk reduction* necessarily results through changes in the individual because risk is inherent in the individual. The majority of such changes presumably would occur through treatment, and they might include decreased deviant sex drive, decreased distortions in sexual attitudes, decreased psychopathy, and increased impulse control, among others – often labeled stable dynamic variables (e.g., Hanson & Harris, 2000, 2001). Just as effective risk management requires accurate risk assessment, so does effective treatment. Specifically, accurate risk assessment informs decisions about the necessary length and intensity of treatment, with higher risk offenders presumably requiring a longer-term and more intense treatment experience to effectively lower their risk and divert them toward a non-offending path. Of course, a psychological needs assessment also would be necessary to provide focus to treatment (see Figure 2).

Insert Figure 2 here

In the same way that risk management practices should match the risk levels of individuals, the intensity and duration of treatment should also be matched to risk level. The absence of risk assessment produces “one size fits all” treatments in regard to intensity and duration, and inaccurate risk assessment produces mismatched treatment placements. In an era of restricted resources, this often translates into treatments that are too intense and costly for very low risk offenders and inadequate for high risk offenders. This approach to treatment also results in mixing low risk and high risk offenders, which may actually increase the risk of initially low

risk offenders through contagion effects (Boxer, Guerra, Huesmann, & Morales, 2004). Such contagion effects may be particularly problematic with juveniles, who are more malleable than adults. Therefore, an important part of treatment may involve segregation of low risk juveniles from higher risk juveniles. In fact, for some very low risk juvenile sexual offenders, detection, segregation from higher risk offenders, and a basic psycho-educational program may be the only intervention needed. Resources saved with lower risk offenders could then be invested in longer-term, intensive treatment for higher risk offenders.

A second level of assessment is also required to reduce risk through treatment, specifically the assessment of treatment outcomes and the resulting modified level of risk. The achievement of treatment outcomes and their resulting impact on risk must be carefully measured. Historically, treatment outcomes have been assessed simply at the very broad level of whether offenders completed or failed to complete treatment (e.g., Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2004). As an initial step to advance the assessment of modified risk, we must continue to develop specific treatment goals, evaluate the achievement of each of those goals, and assess the impact of each goal attainment on risk. Some of the most promising work in this area is being conducted by Karl Hanson and Andrew Harris in conjunction with the development of a dynamic risk assessment tool, the Sex Offender Needs Assessment Rating (SONAR; Hanson & Harris, 2001)

Risk Assessment with Adult Sexual Offenders

As discussed above, accurate risk assessment plays a central role in both risk management and treatment for sexual offenders. Furthermore, it has been well established over the past several decades that unguided clinical judgment is generally unable to produce reliable and accurate predictions of either general violence (e.g., Monahan, 1981; Bonta, Law, & Hanson,

1998) or sexual violence (e.g., Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2004); whereas, the general superiority of statistical (actuarial) prediction over clinical prediction is well documented in the pioneering work of Paul Meehl (1954) and subsequent researchers (e.g., Grove & Meehl, 1996; Grove, Zald, Lebow, Snitz, & Nelson, 1995, 2000; Swets, Dawes, & Monahan, 2000). Unfortunately, despite such conclusions, sexual offender risk assessment continued to rely heavily on unguided clinical judgment until the middle to late 1990's. Significant gains in risk assessment with sexual offenders were realized in the 1990's based on extensive primary research and meta-analyses to identify variables that were empirically linked to sexual recidivism and the resulting development of actuarial risk assessment tools for sexual offenders. These developments largely focused on adult, male, sexual offenders because this was the group that committed the largest proportion of known sexual offenses and, therefore, was immediately subjected to the legislation described earlier.

The most commonly used actuarial risk assessment tools for adult sexual offenders include the Sex Offender Risk Assessment Guide (SORAG; Quinsey, Rice, & Harris, 1995), the Rapid Risk Assessment of Sexual Offense Recidivism (RRASOR; Hanson, 1997), the Minnesota Sex Offender Screening Tool – Revised (MnSOST-R; Epperson, Kaul, Huot, Hesselton, Alexander, & Goldman, 1998, 2000), and the STATIC-99 (Hanson & Thornton, 1999, 2000). These tools largely built on the earlier success of actuarial methods to predict general recidivism and the successful development of what was later named the Violence Risk Appraisal Guide (VRAG; Harris, Rice, & Quinsey, 1993) as an actuarial risk assessment tool for general violent recidivism (Quinsey, Rice, & Harris, 1995). These empirically validated tools have substantially exceeded the level of accuracy produced by clinical prediction, and none of the tools has consistently emerged as more accurate than the others (Hanson & Morton-Bourgon, 2004; Langton,

Barbaree, Harkins, Seto, & Peacock, 2002). Because of their greater and more consistent accuracy, these actuarial risk assessment tools are widely used to inform a variety of release-related decisions, including decisions regarding civil commitment, level of community notification, and level of supervision (Doren, 2002).

Risk Assessment with Juvenile Sexual Offenders

Although adults were the initial focus of most risk assessment and risk management research, accurate risk assessment with juveniles is just as important as with adults. It offers many of the same advantages, including the ability to more efficiently allocate limited resources by matching placement, programming, and treatment intensity with risk, as well as the ability to segregate lower risk juvenile sexual offenders from higher risk offenders. Such advantages may be even more important for juveniles relative to adults given the greater likelihood of treatment success when interventions occur at younger ages and given that contagion effects from mixing lower and higher risk offenders have been clearly documented with juveniles (e.g., Boxer et al., 2005). Nonetheless, empirically based risk assessment tools have been slow to develop for juveniles.

At the present time, only four such tools have been presented and described in published articles: Juvenile Sex Offender Assessment Protocol (J-SOAP; Prentky, Harris, Frizzell, & Righthand, 2000), now in its second version (J-SOAP-II; Prentky & Righthand, 2003; Righthand, Prentky, Knight, Carpenter, Hecker, & Nangle, 2005); Estimate of Risk of Adolescent Sexual Offense Recidivism (ERASOR; Worling & Curwen, 2001; Worling, 2001, 2004); Juvenile Risk Assessment Tool (J-RAT; Rich, 2001a, 2003); and Risk Assessment Matrix (RAM; Christodoulides, Richardson, Graham, Kennedy, & Kelly, 2005). In addition, Phil Rich

has developed several variants of the J-RAT for specialized populations and/or for reassessing and monitoring risk during treatment (Rich, 2001b).

Each of these tools was developed based on a review of the literature and/or clinical observation, and they include a mixture of static and dynamic risk factors or items. The J-SOAP-II contains 28 items, the ERASOR contains 25 items, the J-RAT contains 118 items, and the RAM contains 26 items. These tools were carefully conceptualized and developed by leaders in the field, and each of the tools possesses many strengths. The tools would, however, be best characterized as structured- or guided-clinical assessment tools, rather than actuarial tools, primarily because they provide no empirically derived rules for how to weight and combine risk factors into an overall assessment of risk. Instead, the final risk judgment is largely left to the clinician doing the assessment. In addition, although several of these tools are empirically based, the development samples used were generally small and specific to clinical settings, raising some questions about whether the samples were representative of the broader range of juvenile sexual offenders. Finally, we could locate only one study that validated any of these tools against observed sexual recidivism, and this study was based on a sample of 54 (6 sexual recidivists) and produced somewhat mixed results (Hecker, Scoular, Righthand, & Nangle, 2002).

Thus, there appeared to be an opportunity to contribute to the literature by developing an actuarial juvenile sexual recidivism risk assessment tool on a large and broadly representative sample. The planned second step of this endeavor is, of course, a validation study with an independent sample. The hope is that such a tool would augment existing tools and bring increased accuracy to risk assessment with juvenile sexual offenders. This is, of course, and empirical question to be answered through future research.

Development of the JSORRAT-II

The slower development of empirically validated risk assessment tools for adolescents is probably due to several factors. One potential reason is the fact that adults commit most sexual offenses. However, based on data for 1991-96 from the National Incident Based Reporting System, Snyder (2000) reported that juveniles committed 23% of all sexual offenses and 40% of sexual offenses against children age 11 or younger. Such substantial numbers point to the need for empirically derived measures of risk for juvenile sexual offenders.

A second possible reason is that, at least initially, legislative mandates such as community notification were targeted at adults, resulting in less urgency to develop risk assessment tools for juveniles. A related possible reason was that some feared that the development of empirically validated risk assessment tools for juveniles would hasten the application of such legislation to adolescents. As a point of fact, we began development of the JSORRAT-II only after it became apparent that many states were already engaging in community notifications for adolescent sexual offenders, in some cases for all juvenile sexual offenders, despite the lack of appropriately developed and validated risk assessment tools.

We believe that broad community notification for juveniles who offend sexually is generally a mistaken strategy because of the many likely negative effects for the juvenile and his or her family that are *not* offset by comparable benefits to society. Potential negative effects include ostracism, stigmatism, harassment, and withdrawal of social support for both the offender and his or her family. In addition, the offender may experience physical harm or the threat of physical harm as well as the loss of important developmental opportunities, such as employment and organizational membership (e.g., sports teams, clubs). Although no empirical studies of the effects of broad community notification on juvenile sexual offenders have been

published, a study by Zivits, Crim, and Farkas (2000) documented the presence of many of these effects with adult sexual offenders.

If there were compelling, offsetting benefits to society, particularly a documented decrease in sexual recidivism associated with community notification, such negative effects arguably might be tolerable. Although community notification statutes are politically popular, there is *no* empirical evidence that they constitute an effective risk management strategy to reduce juvenile sexual recidivism. Ironically, the discouragement, fear, and/or anger that may be experienced by juvenile sexual offenders subjected to community notification and its associated negative consequences may interfere with treatment designed to reduce risk. In fact, the chances of a reoffense may actually increase under such conditions.

Within this context, community notification is a particularly misguided strategy when it fails to recognize the tremendous heterogeneity among juvenile sexual offenders based on the nature of their crimes (e.g., Knight & Prentky, 1993), their risk for sexual recidivism, and their potential to respond favorably to detection, education, and treatment (e.g., Walker, McGovern, Poey, & Otis, 2004). Consequently, it seemed that an appropriately developed and validated actuarial tool would provide an empirical basis for attempting to limit the scope of community notification in states that notify on adolescent sexual offenders, in addition to providing critical information for placement, programming, treatment, and resource allocations decisions.

Goals of the JSORRAT-II

Given the significant contributions of empirically developed and validated actuarial risk assessment tools for adults, we assumed that the same approaches could be effective in risk assessment with juveniles. We also believed that only shorter-term predictions would be possible given the incomplete level of development in adolescence. Consequently, our goal was

to develop a tool that would assess the risk of juvenile sexual recidivism, then subsequently evaluate the ability of that tool to also assess the risk of longer-term sexual recidivism.

Whereas adult risk assessment tools have probably been used most extensively in conjunction with forensic decisions, such as civil commitment and community notification, the intended application of the JSORRAT-II necessarily differs because of its target population. Our hope is that accurate risk assessment tools for juveniles will be used to better segregate lower risk juveniles from higher risk juveniles, better match treatment length and intensity with risk (noting that psychological and other assessments will be necessary to appropriately focus treatment), and better match placement supervision/security with risk. As noted earlier, accurate risk assessment may also aid in limiting the scope of community notification for adolescents.

To achieve the goal of developing a reliable and accurate actuarial risk assessment tool for juveniles that could inform the types of decisions just described, it was important for the tool to have a number of characteristics. First, the tool would have to be broadly applicable to a range of juvenile sexual offenders, including those that have not received treatment. Consequently, we followed the lead of several adult risk assessment tools and limited potential items to those for which there would be information in typical juvenile court and youth corrections files. Second, we focused on data sources for which we had greater confidence in their reliability and consistency across case files. For example, when looking at past history of sexual offending, we looked at incidents that were officially documented and not simply alleged. Third, in designing data collection instruments, we tried to make data points as behaviorally anchored as possible (e.g., events that either occurred or did not occur, as opposed to assessing mood states or personality characteristics). However, there were some instances in which this was less possible due to the nature of the information required. Finally, we were committed to

developing a risk assessment tool that was as simple and intuitive as possible without losing accuracy.

Sample

The development sample used was exhaustive and included 636 male juveniles adjudicated for a sexual offense in the state of Utah between 1990 and 1992 while under the jurisdiction of the juvenile court, which is generally from age 12 through age 17. Because of some flexibility regarding the ages during which the juvenile court has jurisdiction in Utah, four people in our sample were 11 years old at intake for the index sexual offense and 10 people were 18 years old at intake for the index sexual offense.

Because this was an exhaustive sample of all eligible juveniles for whom we could find records, it included the full spectrum of juveniles who offend sexually, both geographically within the state and in regard to their offense histories and characteristics. The majority of the sample (76.4%) was Caucasian, 7.7% were Hispanic/Latino, 2.2% were African American, 1.6% were Asian American, 1.4% were Native American, 1.1% were multiethnic or other, and 9.6% were unspecified. As noted earlier, ages our sample ranged from 11 to 18 years old at intake for the index sexual offense, and the average age was 15.18 ($sd = 1.57$). Approximately one quarter (22.6%) of the sample received a secure placement for their index sexual offense, 8.2% had received some type of sexual offender specific treatment prior to their index offense, and 44.5% received some type of sexual offender specific treatment during their involvement with the juvenile justice system for the index sexual offense.

Data Collection Materials and Procedures

Case file preparation and content. Juvenile judicial files and youth corrections case files for the 636 adolescents in the sample were located and copied by staff of the Utah Juvenile Court and the Utah Division of Juvenile Justice Services. The files were then redacted and edited to appear as they did when the juvenile exited the juvenile justice system for their 1990-92 index sexual offense. This work was completed by staff from the same two agencies and by volunteers from a statewide organization of caseworkers and treatment providers for juveniles who offend sexually. By editing the files in this manner, we emulated a prospective research method while working with archival files.

After the files were located, copied, redacted, and edited, they were shipped to Iowa State University for review and data extraction. The case files varied somewhat in their content, but all the files contained a record of criminal involvement with the juvenile justice system up to and including the index sexual offense. This record typically included arrest, investigation, court, and youth corrections reports. Among other information, these reports described the juvenile's past sexual offense perpetrations and the index sexual offense, including information about events leading up to sexual offenses, the nature of the offenses, and information about the victim or victims. The majority of files also had caseworker reports and/or psychological evaluations that provided background information for the juvenile and his family regarding educational history, social functioning, substance abuse and mental health issues, and treatment history. Finally, a number of files contained histories of familial involvement with the courts and the Department of Human Services regarding child neglect and child sexual, physical, and emotional abuse.

Case file review, data extraction, and data entry. Eight research assistants at Iowa State University who had no knowledge of the juveniles or their sexual recidivism outcomes reviewed the case files and extracted data into codebooks. One background codebook was completed for each juvenile. Items recorded in the background codebook provided demographic data and information about care-giving structure, family relationships, child abuse history, educational history (academic and behavioral), consenting sexual history, substance abuse history, mental health history, treatment history (substance abuse, mental health, and sexual offender specific), non-sexual offense charges and adjudications, and sexual offense charges and adjudications.

In addition to the background codebook, an offense characteristics codebook was completed for each separate victim of sexual offenses perpetrated by the juvenile offender. Consequently, each juvenile could have multiple offense characteristics codebooks. Each offense characteristics codebook provided information about the victim (e.g., gender, age, relationship to the perpetrator), pre-offense behaviors (e.g., stalking, grooming), methods for achieving compliance (e.g., force, threat of force, bribery), offense locations (e.g., school, victim's home, offender's home), specific sexual acts in the offense (e.g., fondling, penetration), role of the juvenile offender in the offense (e.g., sole perpetrator, leader of group, member of group), and post-offense behaviors (e.g., told victim not to tell, threatened harm if victim told, confessed) for each unique victim of a sexual offense.

The research assistants were trained to correctly read the contents of the files and accurately extract data into the codebooks during multiple meetings of one to two hours duration each. Detailed instructions were provided for each individual item in the codebooks during these meetings. Research assistants were then paired and given identical practice cases to do individually. After completing the case, the assistants met with the lead researcher to review the

file and discuss any discrepancies in coding. This process was repeated until the research assistants could produce consistent codebooks. The research assistants then coded the case files according to the prescribed protocol. When questions arose, they were directed to the lead researcher for discussion and clarification. The results of those discussions were shared with the entire group in periodic team meetings and through a common log that was kept in the research lab.

When all cases had been coded, research assistants entered the data from the codebooks into an electronic spreadsheet. Two separate research assistants entered each codebook, and the records were compared for discrepancies that signaled data entry errors. When discrepancies were encountered, the original codebook was consulted to determine which entry was correct.

Sexual recidivism data. Information about sexual recidivism was obtained only after all files had been reviewed. Juvenile sexual recidivism was the outcome of primary interest, and it was defined as a charge for a new sexual offense prior to the age of 18. The Utah Division of Youth Corrections provided this information from a statewide electronic database of juvenile offenders. The base rate in the sample for juvenile sexual recidivism was 13.2% (84 juvenile sexual recidivists in the sample of 636).

Information on adult sexual recidivism, defined as a charge for a new sexual offense after the age of 18, was also obtained through 2003. This information was collected through a check of Utah's state-wide criminal offender data base and the FBI's National Crime Index data base. Offenders in our sample ranged in age from 22 years old to 31 years old at the time the adult recidivism data were collected. A total of 58 offenders sexually recidivated as adults, constituting a 9.1% adult sexual recidivism base rate. Sixteen of the 58 adult sexual recidivists also recidivated as juveniles, and the remaining 42 offenders sexually recidivated for the first

time as adults. Anytime recidivism, defined as a new charge for a sexual offense as either a juvenile or young adult prior to 2004, was generated by combining the juvenile and adult recidivism data. The base rate in the sample for anytime sexual recidivism was 19.8% (126 out of 636 recidivated as a juvenile and/or as an adult).

Item Selection Procedures and Analyses

General analytic procedures. The dependent variable in all analyses was juvenile sexual recidivism, defined as a charge for a new sexual offense subsequent to the index offense while still under the jurisdiction of the juvenile court. All such offenses occurred prior to age 18 in our sample. The analytic procedure followed was designed to identify the set of variables that optimally separated juvenile sexual recidivists from those who did not have any new charges for a juvenile sexual offense. After that set of variables was identified, its ability to predict anytime recidivism, defined as any new charge for a sexual offense regardless of age, was also assessed.

The analytic procedure initially used continuous variables whenever possible and tested for both linear and curvilinear relations between potential predictor variables and juvenile sexual recidivism. The specific steps in item selection analyses are described in more detail below. To facilitate those analyses, however, variables were first organized hierarchically into *families*, *groups*, and *subgroups* based on conceptual similarity. For example, one of the variable *families* was a history of child abuse. The four *groups* within this family were sexual abuse, physical abuse, emotional abuse, and neglect. Within each of these groups were *subgroups* of similar variables. Within the sexual abuse group, for example, one *subgroup* included the different types of sexual abuse and another *subgroup* included several ways of looking at frequency of sexual abuse.

In all, ten families of variables were evaluated. These families were history of sexual offending, sexual offense characteristics, sexual offender treatment, child abuse, special education, discipline problems at school, family instability, mental health diagnoses, mental health treatment, and non-sexual offending.

Item Selection Analyses

Five steps were involved in item selection. *Step 1* involved identifying all individual subgroup variables that were significantly associated with juvenile sexual recidivism ($p < .05$). Categorical variables were tested with chi-square analyses, and continuous variables were tested through correlation analyses.

Step 2 identified the best marker variables within each subgroup. Subgroups that did not yield a single variable significantly associated with juvenile sexual recidivism were eliminated from further analyses. In subgroups that yielded multiple variables significantly associated with juvenile sexual recidivism, simultaneous and hierarchical logistic regression analyses were used to select the optimal predictors and eliminate redundant predictors within those subgroups. Specifically, all the significant variables within one subgroup were entered into a simultaneous logistic regression model. If the Wald chi-square statistics were significant for each of the variables, indicating that each was making a unique contribution to the prediction of juvenile sexual recidivism, all variables were retained and no further analyses were needed. If not all variables were significant, the next action depended on the number of variables. If there were only two variables in that subgroup, then the one variable that was significant was retained and the other was dropped without additional analyses. In cases where neither variable yielded a significant Wald chi-square statistic when entered simultaneously because of suppression effects, the stronger of the two variables was retained. If there were more than two variables, then

hierarchical logistic regression analyses were used to assess variables in different orders to determine the optimal set of predictors. If no real pattern emerged, then the variables were collapsed into a single variable. For example, in the subgroup for type of child sexual abuse, the variables for each type of “hands-on” sexual abuse (e.g., fondling, penetration of anus) were correlated with each other, and the presence of each type of “hands-on” sexual abuse produced a similar increase in juvenile sexual recidivism of about 20%. In this case, those variables were collapsed into a single new variable reflecting the presence or absence of any “hands-on” sexual abuse.

In *Step 3*, the subgroup variables retained in the previous step were analyzed using similar procedures to identify the best marker variables within each group. In analyzing variables at the group level, we utilized a “drill-down” strategy, in which we started at the most general level, then “drilled down” to more specific levels to determine whether greater specificity enhanced predictive accuracy. Hierarchical logistic regression was used for these analyses. For example, in the sexual abuse group the most general variable, the presence or absence of any sexual abuse, was entered in the first block, then the presence or absence of “hands-on” sexual abuse was entered in the second block. The presence of “hands-on” sexual abuse added significantly to the presence of any sexual abuse in predicting juvenile sexual abuse. However, the reverse was not true, so the variable for any sexual abuse was dropped as a potential item and the variable for “hands-on” sexual abuse was tentatively retained as we “drilled down” further to look at the impact of frequency of “hands-on” sexual abuse. In the next analysis, the presence of “hands-on” sexual abuse was entered in the first block, and the frequency of “hands-on” sexual abuse was entered in the second block. Frequency of “hands-on” sexual abuse added significantly to the simple presence of “hands-on” sexual abuse in the

prediction of juvenile sexual recidivism. Because the simple presence or absence of “hands-on” sexual abuse became non-significant, the only variable to emerge from the sexual abuse group was the frequency of “hands-on” sexual abuse.

Step 4 involved evaluating all of the surviving group variables within families to identify the best marker variables within each family. To be retained at the fourth step, group variables not only had to make a unique contribution to the prediction of juvenile sexual recidivism relative to other group variables in the same family, but also relative to the sexual offending history family of variables. Given that the best predictor of future behavior is past behavior and support for the application of this principle to sexual offending has been documented (e.g., Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2004; Långström, 2002; Rasmussen, 1999), we wanted to ensure that variables retained beyond this step added to the prediction of juvenile sexual recidivism beyond that accounted for by sexual offending history.

Using procedures similar to those described in the previous step, the first part of Step 4 identified group variables that made a unique contribution to the prediction of juvenile sexual recidivism relative to other group variables in the same family. In the second part of Step 4, all significant and independent variables in the sexual offending history family were entered in the first block of several hierarchical logistic regression analyses, and the other group variables retained in the first part of this step were entered one group at a time as the second block in separate analyses. Any group variable that did not add significantly to the sexual offending history family of variables in the prediction of juvenile sexual recidivism was dropped from further analyses.

Some of the stronger variables within each of the ten families are summarized in Table 1. Variables in this table with at least one asterisk made a unique contribution to the prediction of

juvenile sexual recidivism relative to other variables in the same family. Variables with two asterisks also predicted juvenile sexual recidivism above and beyond the sexual offending history family or were members of that family.

Insert Table 1 here

Step 5, the final step in item selection, identified the optimal number of families through hierarchical logistic regression. The families were entered in the following order: sexual offending history, sexual offense characteristics, child abuse, sexual offender treatment, special education, school discipline, mental health diagnoses, mental health treatment, family instability, and non-sexual offending history. Each block was required to add significantly to the prediction of juvenile sexual recidivism at the $p < .05$ level, and each variable within the family was required to be significant at the $p < .10$ level to be retained. When a variable was retained, it remained in the model regardless of how it performed as additional variables were added to the model.

The results of these analyses are summarized in Table 2. As indicated there, twelve variables from seven families plus two non-linear effects for one of those variables emerged from this process as the optimal set of predictors for juvenile sexual recidivism.

Insert Table 2 Here

Accuracy of the Regression Model with the Development Sample

Assessing the accuracy of the logistic regression model with the development sample does not constitute a validation of the model because the model was “tailor made” for the sample on which it was developed. Therefore, any model or risk assessment tool must be validated with an independent sample. However, before investing the major resources necessary for an independent validation, it should be confirmed that the model or risk assessment tool performs well with the development sample. To accomplish this, the ability of the logistic regression model to correctly classify juvenile sexual recidivists and non-recidivists in the development sample was assessed in two ways, both using the predicted probability of juvenile sexual recidivism generated by the regression model for each juvenile sexual offender (JSO) in the sample.

Predicted outcomes by observed outcomes classification table. The first method of evaluating the accuracy of the regression model involved the use of a traditional 2 x 2 classification table for a probability cut-score of .50. Each JSO with a probability score of .50 and higher was predicted as positive (to be a sexual recidivist) and each JSO with a probability score below .50 was predicted as negative (to not be a sexual recidivist). The cross-tabulation of predicted outcomes with the observed outcomes is presented in Figure 3.

There are a number of different ways to assess the accuracy of the predicted outcomes in the classification table in Figure 3. From a risk assessment perspective, positive predictive power and negative predictive power are two of the most important indices of accuracy. Positive predictive power is the conditional probability of juvenile sexual recidivism occurring given a positive prediction of recidivism. In other words, positive predictive power is equal to the proportion of all individuals predicted to sexually recidivate who actually do sexually recidivate.

This is also often referred to as the rate of true positive predictions. As indicated in Figure 3, the positive predictive power of the full regression model was .73, meaning that 73% of individuals predicted to reoffend (probability scores of .50 or higher) did sexually recidivate as juveniles (40 out of 55 instances). In contrast to true positive predictions, false positive predictions occur when individuals are predicted to be positive but, in fact, do not sexually recidivate. Therefore, the rate of false positive predictions is equal to 1 minus the true positive rate ($1 - .73 = .27$), so 27% of the positive predictions in Figure 3 were false positive predictions (15 out of 55).

 Insert Figure 3 here

Negative predictive power is similar to positive predictive power but focuses on negative predictions (predictions that juvenile sexual recidivism will *not* occur). Negative predictive power is the conditional probability of juvenile sexual recidivism *not* occurring given a negative prediction. Of the 581 individuals with negative predictions, 537 actually did not sexually recidivate as juveniles. This yielded a negative predictive power of .92, meaning that 92% of the negative classifications were true negative predictions. Conversely, the rate of false negative predictions was .08 ($1 - .92$), which reflects that 8% of the negative predictions (44 out of 581) were incorrect because the individual did, in fact, sexually recidivate.

The reason that positive predictive power and negative predictive power are two of the most important measures of accuracy for risk assessment is because these conditional probabilities represent the situation we find ourselves in when conducting risk assessments. At that time, we are trying to assess the risk of a future, unknown outcome based on a score or risk level from validated risk assessment tool. In this situation, it is critical to know the rate of

juvenile sexual recidivism for comparable groups of individuals with the same score or risk level on that tool.

Two other important measures of accuracy are sensitivity and specificity. Whereas positive predictive power and negative predictive power are conditional probabilities given a predicted outcome (either positive or negative), sensitivity and specificity are conditional probabilities given an observed outcome (either positive or negative). Sensitivity is the proportion of all individuals who sexually recidivate as juveniles that were correctly classified or predicted to be positive (recidivists). This proportion is also often referred to as the hit rate. The sensitivity of the full regression model in the development sample was .48, indicating that 48% of all juvenile sexual recidivists in the sample were correctly predicted as positive using a probability cut-score of .50. One minus sensitivity yields the miss rate for sexual recidivists, which is .52 in this example.

Specificity is the proportion of all individuals who do *not* sexually recidivate as juveniles that were correctly classified or predicted to be negative (non-recidivists). The specificity of the full regression model in the development sample was .97, indicating that 97% of all juvenile non-recidivists in the sample were correctly predicted as negative using a probability cut-score of .50. The proportion of juvenile non-recidivists incorrectly predicted as positive, or to be recidivists, is generally referred to as the false alarm rate. This is calculated as 1 minus specificity, so the false alarm rate for the data in Figure 3 is .03, meaning that 3% of all non-recidivists were falsely predicted to be positive (15 out of 552).

The sensitivity of a validated risk assessment tool is important complementary information to the tool's positive predictive power. To illustrate, consider the hypothetical case of a risk assessment tool validated for your population using a specified cut-score with a positive

predictive power of .80 and a sensitivity of .15. With such a tool, there would be a high degree of confidence in positive predictions, or high risk classifications, given the 80% sexual recidivism rate for high risk individuals in the normative samples. However, because only 15% of recidivists would be expected to score in the high risk range, 85% of recidivists would be expected to score in the low risk range using the specified cut-score. Consequently, while false positive predictions would be relatively rare, false negative predictions would be more common.

Some might mistakenly assume that using a cut-score on a validated tool that produces such a pattern of positive predictive power and sensitivity would not be valuable. In fact, such a tool could be very useful in informing decisions and actions for which the costs of false positive predictions are clearly higher than the costs of false negative predictions. An example within the context of juvenile sexual offenders would be selection of juveniles for placement in long-term, residential treatment in a high-security facility. Placement of a low risk juvenile in such a setting through a false positive prediction is very costly at the individual level because of the loss of liberty through the unnecessary placement in a highly restrictive setting. It is also very costly to society because of the much higher expenses required to maintain juveniles in long-term, high-security, residential treatment programs.

Some might argue that the cost of false negative predictions is even higher in such decisions. This argument is based on the assumption that the cost associated with not placing a high risk juvenile in a high-security facility as a result of a false negative prediction is further victimization. This is not necessarily the case, however, because the alternative to being placed in such facility is generally not to simply release the adolescent. Instead, juveniles considered for, but not placed in, a long-term, high-security facility generally still receive a significant level

of treatment and supervision rather than to just being returned to the community with no treatment or supervision.

A similar example with adult sexual offenders is the civil commitment of those who have served their prison sentences. The costs of false positive predictions are clearly very high, both to the individual and to society. An individual who is unnecessarily committed suffers an obvious loss of liberty, perhaps for the rest of his or her life. At the societal level, such actions are also very costly, both financially and socially. The financial costs of civil commitment are enormous, generally approaching or exceeding \$100,000 per year for each person committed, in addition to the significant legal fees associated with each case (Lieb & Goodkin, 2005; Winick & La Fond, 2003). From a social perspective, civil commitment statutes are viewed by some as a threat to constitutionally guaranteed freedoms. Largely because of these costs, most states with civil commitment statutes commit only a small proportion of sexual offenders, generally 10% or less (Lieb, 2005), so sensitivity is not a major issue. Again, the cost of false negative predictions is not necessarily further victimization because high risk offenders that are not civilly committed are typically subjected to a range of risk management procedures that increase the likelihood of detection in pre-offense behaviors and intervention prior to further victimization.

In an analogous manner, the specificity of a validated risk assessment tool provides important complementary information to the tool's negative predictive power. For example, a given cut-score on a validated risk assessment tool may yield a negative predictive power of .99, which is excellent. However, if the specificity of this cut-score is only .10, enthusiasm is dampened by the realization that 90% of all non-recidivists would be falsely classified as high risk. Although such a profile of accuracy would not be useful in informing a wide range of decisions, it would be potentially useful in making decisions about low frequency actions for

which the costs associated with false negative predictions are enormous and the costs associated with false positive predictions are relatively small. Determining who to release to the community with minimal supervision would be an example of such a decision.

Overall accuracy is a fifth type of accuracy that can be calculated from the 2 x 2 classification table in Figure 3. This is calculated as the sum of the true positive and true negative classifications divided by the total number of cases, so the overall accuracy is .91 for the data in Figure 3. The overall accuracy of a specific cut-score is often not helpful, however, because identical levels of overall accuracy can result from very different patterns of positive predictive power, negative predictive power, sensitivity, and specificity. As described earlier, differences in these patterns are important.

Implicit in the discussion of the accuracy of specific cut points on validated actuarial risk assessment tools are two important values of actuarial risk assessment. The first value is that good estimates of all of the various measures of accuracy can be obtained for any given cut-score on a well-developed and validated actuarial risk assessment tool, something that is difficult or even impossible with other approaches to risk assessment. The second value is that different cut-scores can be selected on a validated risk assessment tool for different decisions. As noted earlier, different cut-scores on the same risk assessment tool generate different patterns or profiles of accuracy. Positive predictive power and specificity increase as higher cut-scores are selected, but sensitivity and negative predictive power decreases. The reverse pattern is observed when lower cut-scores are selected. This characteristic enables users to select the cut-score that generates the most appropriate accuracy profile given the relative costs of false positive and false negative predictions associated with the contemplated decision or action. Although the developer must provide complete information regarding accuracy profiles for

various cut-scores and provide guidance in the potential use of cut-scores, the selection of specific cut scores for particular decisions or actions is ultimately made by users (e.g., program administrators, probation administrators, courts, etc.).

Area under the ROC curve. Because of the possibility and desirability of using different cut-scores for different decisions, the accuracy of risk assessment tools must be assessed across all possible cut-scores rather than for just one cut-score. The best measure of the overall accuracy of a risk assessment tool is the area under the receiver operator characteristics (ROC) curve, as discussed in detail by Quinsey, Harris, Rice, & Cormier (1998), Swets (1996), and Swets et al. (2000). The ROC curve is generated by plotting sensitivity (hit rate) on the Y-axis against 1 minus specificity (false alarm rate) on the X-axis for all possible cut-scores on the risk assessment tool being evaluated. If done by hand, one would generate a 2 x 2 classification table for each possible cut-score, calculate the sensitivity and 1 minus specificity for each of the tables, then plot these values on a graph. The area under the resulting curve reflects the overall accuracy of the risk assessment tool. This value can range from 0 to 1.0, with a value of .50 being equal to a chance-level of accuracy. Values significantly greater than .50 reflect a significant improvement over chance, and a value of 1.0 reflects perfect predictive accuracy.

Fortunately, there are several statistical software packages that can generate ROC curves and calculate the area under the curves, such as the *Statistical Package for the Social Sciences* (SPSS) versions 10 and higher. The ROC curve for the probability cut-scores generated by the full logistic regression model is presented in Figure 4. The area under the ROC curve was .91, with a 95% confidence interval of .87 to .94. Because the confidence interval does not include .50, the performance of the full regression model exceeded chance level. In fact, this level of accuracy would generally be considered to be very strong, but it is important to emphasize,

again, that this was achieved with the development sample. Application of the full logistic regression model to an independent sample would be expected to produce a smaller area under the ROC curve.

Insert Figure 4 here

Simplification of the Model

The full logistic regression model clearly performed well with the development sample, but regression models with individual beta weights for each linear and non-linear effect are complex and difficult for many to understand or implement. Consequently, we wanted to explore a simpler, more robust, categorical scoring system to assess the tradeoff between simplicity and information loss. The simple, categorical scoring method used for each of the final twelve variables was applied in the following manner. A score of zero was assigned to the level of each variable associated with the lowest rate of juvenile sexual recidivism, and the score was increased by one for each level of the same variable associated with a meaningful increase in the rate of sexual recidivism. The distribution of variables was truncated at the upper end when the distribution became too thin to create additional categories of adequate size. With one exception, all levels of the final 12 variables included at least 25 offenders. Listed below is the categorical scoring for one variable, number of juvenile sexual offense adjudications, as an example.

Number Juvenile Sexual Offense Adjudications	<i>N</i>	Juvenile Sexual Recidivism Rate	Categorical Score
One	452	6.2%	0
Two	118	26.3%	1
Three	37	35.1%	2
Four or more	29	41.4%	3

When variable levels did not produce meaningfully different rates of juvenile sexual recidivism, those levels were collapsed in the new categorical system. The frequency of officially documented “hands-on” sexual abuse provides such an example. One, two, three, or four instances of “hands-on” sexual abuse were each associated with approximately a 25% rate of juvenile sexual recidivism, so these four levels were collapsed into one level, as illustrated below. The scoring of all twelve variables is presented in Table 3

Number of “Hands-On” Sexual Abuse Incidents	<i>N</i>	Juvenile Sexual Recidivism Rate	Categorical Score
None	533	9.8%	0
One to four	77	26.0%	1
Five or more	26	46.2%	2

 Insert Table 3 here

Performance of the simplified model. The performance of the simplified model was assessed by using the total score from the twelve, categorically scored, variables as the predictor in an ROC analysis. The area under the ROC curve for the simplified model was .89 (95% CI of .85 to .92). This value is not significantly different from that of the full regression model, so very little loss of information was associated with the simplified model. Consequently, the simplified model was used in all subsequent analyses, and it was named the Juvenile Sexual Offense Recidivism Risk Assessment Tool – II (JSORRAT-II).

JSORRAT-II Scores and Associated Juvenile Sexual Recidivism Rates in the Development Sample

The range of possible scores on the JSORRAT-II is 0 to 21, and the range of actual scores in the development sample was 0 to 15. The observed rates of juvenile sexual recidivism associated with each score in the development sample are presented by the heavier of the two lines in Figure 5. The lighter line reflects the “smoothed” relation between JSORRAT-II scores and juvenile sexual recidivism. The “smoothed” curve was generated by regressing JSORRAT-II total scores onto juvenile sexual recidivism with logistic regression, then plotting the predicted probabilities for each JSORRAT-II score.

 Insert Figure 5 here

The establishment of formal risk levels requires validation of the JSORRAT-II. However, to explore the possible usefulness of the JSORRAT-II, potential risk levels were created based on visual inspection of the actual rates of juvenile sexual recidivism associated with JSORRAT-II scores. These potential risk levels and the associated scores, selection ratios (proportion of offenders classified within each level), and juvenile sexual recidivism rates are

presented in Table 4. Also presented in Table 4 are the 95% confidence intervals for the rates of juvenile sexual recidivism associated with each potential risk level.

The spread of juvenile sexual recidivism rates associated with the potential risk levels in Table 4 is substantial, ranging from 1.0% to 81.8%, and the confidence intervals are largely non-overlapping. Perhaps the most important element of Table 4 is the combination of the selection ratios (proportion of sample scoring within range) and juvenile sexual recidivism rates associated with each potential risk category. The JSORRAT-II was able to identify 48.0% of the development sample with an extraordinarily low juvenile sexual recidivism rate of 1.0%, and another 21.5% of the development sample with a juvenile sexual recidivism rate of only 6.6%. Collectively, these two groups comprised 69.5% of the development sample and had an overall juvenile sexual recidivism rate of only 2.7%.

Insert Table 4 here

There were a number of adolescents in our sample who were relatively old at the time of the index sexual offense. Because some adolescents were at or approaching 18 years of age at the time of their index sexual offense, they may have artificially reduced the juvenile sexual recidivism rates presented in Table 4. Selection ratios and juvenile sexual recidivism rates were recalculated separately for adolescents under the age of 17 at their index sexual offense, and again for adolescents under the age of 16 at their index sexual offense, to explore this possibility. Inspection of Table 5 indicates that very similar patterns were evident in all three groups: the full sample, the under age 17 sample, and the under age 16 sample. In addition, the areas under the

ROC curve were nearly identical for all three groups (full sample = .89, 17 years old and younger sample = .88, 16 years old and younger sample = .88).

 Insert Table 5 here

This pattern illustrates the potential value of the JSORRAT-II in making placement, treatment, and programming decisions, which are essentially resource allocation decisions. The 65% to 70% of the development sample who scored 4 or less on the JSORRAT-II may not require intervention beyond detection, segregation from higher risk juvenile offenders, and a relatively brief psycho-educational program. The resources saved with this group could be allocated to the other approximately 30% of the sample with a more significant risk of continuing a pattern of juvenile sexual offending. This pattern must, of course, be validated before establishing risk levels or making conclusive judgments, but the emergence of this pattern in the development sample is encouraging and illustrative of the potential value of the JSORRAT-II in making resource allocation decisions.

Performance of the JSORRAT-II in Predicting Anytime Recidivism

The JSORRAT-II was developed to assess the risk of juvenile sexual recidivism, but we also subsequently evaluated its ability to predict sexual recidivism as either a juvenile or a young adult, which we labeled *anytime* sexual recidivism. To conduct this evaluation, we determined sexual recidivism statuses through 2003 for the members of our sample. At the time of this determination, the youngest member of our sample was 22 years old and the oldest member of our sample was 31 years old. Juvenile sexual recidivism data through age 18 was already available, and information on sexual recidivism after age 18 was obtained through checks with

the Utah statewide criminal record data base, Utah prison records, and the FBI's National Crime Index data base. As was the case for juvenile sexual recidivism, our criterion for sexual recidivism was a charge for a new sexual offense. A total of 126 offenders sexually recidivated prior to 2004. Sixty-eight offenders recidivated only as juveniles, 16 offenders recidivated both as juveniles and as adults, and 42 offenders recidivated only as adults.

ROC analysis of the prediction of anytime sexual recidivism using total scores from the JSORRAT-II yielded an area under the curve of .79, with a 95% confidence interval of .74 to .84. Although the level of predictive accuracy reflected is quite reasonable and well above chance levels, the area under the ROC curve of .79 is significantly lower than that obtained for juvenile sexual recidivism (.89 with a 95% CI of .85 to .92). This difference suggested that the JSORRAT-II was less predictive of sexual recidivism during young adulthood than during adolescence, so a separate ROC analysis was conducted using sexual recidivism during adulthood as the outcome variable. This analysis produced an area under the curve of .64, with a 95% CI of .55 to .73. Although this level of accuracy still exceeds chance levels, it is substantially lower than the level of accuracy achieved with juvenile sexual recidivism.

Consideration and exploration of this substantial decline in accuracy generated several potential explanations. Two of these are related to the age of offenders at the time of their index sexual offense. Exploration of the data indicated that offenders who sexually recidivated only as adults were considerably older at the time of their index sexual offense (16.13 years) than were those who sexually recidivated only as juveniles (14.44 years), those who sexually recidivated both as juveniles and as adults (14.03 years), and those who did not sexually recidivate (15.33 years). One possibility raised by this observation is that offenders who entered the system at an older age simply did not have enough documented history on which to make predictions. A

second possibility, which is not mutually exclusive with the previous one, is that juvenile sexual offenses committed after age 16, when much maturation has occurred, are more reflective and predictive of adult sexual offending than juvenile sexual offenses committed at an earlier age. In other words, this would be an additional risk factor for adult sexual recidivism.

Additional ROC analyses were performed to explore the impact of age at index offense on the accuracy of the JSORRAT-II in predicting anytime and adult sexual recidivism. The first set of analyses was performed only on those offenders who were under the age of 17 at the time of their index sexual offense ($N = 524$). These analyses generated areas under the ROC curve of .84 for anytime sexual recidivism (95% CI .80 to .89) and .73 for adult sexual recidivism (95% CI .65 to .82). The second set of analyses was performed only on those offenders who were under the age of 16 at the time of their index sexual offense ($N = 433$). These analyses generated very similar areas under the ROC curve: .84 for anytime sexual recidivism (95% CI .79 to .88) and .72 for adult sexual recidivism (95% CI .63 to .81). The improvement in validity indices with the exclusion of older offenders lends credibility to these two possible explanations.

Rates of adult sexual recidivism associated with each of the five potential risk categories constructed in conjunction with juvenile sexual recidivism are presented in Table 6 for the full sample, the under age 17 at index sexual offense sample, and the under age 16 at index sexual offense sample. The adult sexual recidivism base rates and the adult sexual recidivism rates associated with each potential risk category were very similar for the under age 17 and under age 16 samples. The adult sexual recidivism base rates for both samples were approximately half the juvenile sexual recidivism base rates for each of the same two samples. This had little impact on the adult sexual recidivism rates associated with the low and moderately low categories for these two samples, which were very comparable to the parallel rates of juvenile sexual recidivism for

the same two samples. In contrast, the rates of adult sexual recidivism associated with the top three categories were substantially lower than comparable rates of juvenile sexual recidivism for these two samples. Specifically, adult sexual recidivism rates were only approximately one-third of the comparable juvenile sexual recidivism rates. Consequently, whereas the spread of juvenile sexual recidivism rates ranged from about 1% to about 85% across the five categories, the spread of adult sexual recidivism rates only ranged from about 3% to about 30%. In addition, the highest rate of adult sexual recidivism is comparable to that for the moderate level of juvenile sexual recidivism.

Two other possible explanations for the lower accuracy in predicting adult sexual recidivism remain viable. The first of these is that a substantially different set of variables is needed to predict eventual adult sexual recidivism with greater accuracy for offenders who are still juveniles. Alternatively, it simply may not be possible to achieve greater accuracy in predictions of adult sexual offending behavior based on adolescent behavior because of the complexity and magnitude of developmental changes occurring during adolescence.

Factor Structure of the 12 JSORRAT-II Items

Although the items of the JSORRAT-II emerged through an empirical selections process, it is still helpful to try to understand the underlying constructs that these items might reflect. An exploratory principle components analysis of the 12 items was conducted to examine potential underlying structure. Examination of the scree plot in Figure 6 suggested a four-factor solution, and the rotated factor structure, using a varimax rotation, is presented in Table 7.

The first factor is defined by number of sexual offense adjudications, length of sexual offending history, and number of sexual offense victims. All three variables clearly tap the

persistence of sexual offending behavior, and these variables may be behavioral proxies for the magnitude/persistence of the drive to engage in sexual offending behaviors.

The second factor is defined by number of adjudications for non-sexual offenses, number of educational periods (elementary school, middle school, high school) with discipline problems, commission of a sexual offense while under supervision, and placement in special education. The items defining Factor 2 strongly suggest an antisocial orientation with problems conforming to rules and relating appropriately with authorities. The one loading that might raise questions is that of placement in special education. It is important to remember, however, that this variable included behaviorally disordered placements. In addition, many children with other special education placements may also have problems with rule violations.

The third factor is defined by number of physical abuse incidents, number of sexual abuse incidents, and, to a lesser degree, prior sexual offending treatment status. The items on this factor suggest a traumatic history of child sexual and physical abuse. The fact that prior sexual offender treatment history also loads on this factor and also somewhat on the first factor, indicates that adolescents with a significant history of child abuse or sexual offending were more likely to have been referred to prior sexual offending treatment. It also suggests that they were more likely to have not done well in treatment. One hypothesized possibility for this association may reside in the interplay between prior violations of trust, particularly from those in a position of authority, and participation in treatment that requires high degrees of trust.

The fourth factor is defined by commission of a sexual offense in a public place and the use of deception or grooming in a sexual offense. The interpretation of this factor is less evident, but one possibility is that this factor is the “flip-side” of the first factor. Although some adolescents are charged for sexual offenses as the result of exploratory sexual behavior, such

exploratory offending behavior usually ceases following detection and sanctions. Factor 1 does not seem to tap that type of behavior. Rather, the items of Factor 1 reflect more persistent engagement in sexual offending behavior, suggestive of a greater drive to engage in such behaviors. However, a number of people have similar urges but do not act on them because of internal controls (good judgment and strong impulse control). Consequently, the “flip-side” of drive to engage in sexual offending behaviors is the lack of judgment and impulse control to not act on such urges. Offending in public clearly exposes the individual to greater risk of detection; therefore, it may reflect impaired judgment and impulse control, as well as greater drive to engage in such acts. Although the case is less obvious for deception and grooming, the item loading on this component may also reflect a tendency to target victims outside the immediate family, requiring additional planning and exposing the juvenile to a greater risk of detection. Again, this may be reflective of impaired judgment and impulse control as well as a greater drive to engage in sexual offending behaviors.

Summary and Conclusions

The primary purpose of the research program described in this chapter was to develop an actuarial risk assessment tool for juvenile sexual recidivism that was relatively brief, based primarily on behaviorally anchored information that was routinely available for most juvenile sexual offenders, and relatively simple and intuitive to use. The resulting tool, the JSORRAT-II, appears to have met those goals. Consisting of 12 items and designed to be scored through a file review, the JSORRAT-II is relatively brief and easy to use. All information required to score the JSORRAT-II should be contained in typical juvenile court and youth corrections files. Because nearly all of the items are behaviorally anchored, scoring of the JSORRAT-II requires little interpretation by the evaluator. Consequently, the JSORRAT-II can be scored easily and

objectively with a modest amount of training. Finally, the categorical scoring and the use of simple total scores make the JSORRAT-II uncomplicated and intuitive to use.

An additional benefit of the JSORRAT-II is the factor structure that emerged, which was relatively interpretable and meaningful. The first two factors, high/persistent drive to engage in sexual offending behavior and an antisocial orientation, were consistent with the first two factors on the J-SOAP (Prentky et al., 2000) and with research on adult sexual recidivism (e.g., Hanson & Morton-Bourgon, 2004). The third factor, history of child abuse, is more controversial. On the one hand, a greater history of child abuse, particularly child sexual abuse, clearly distinguished juvenile sexual offenders from juvenile non-sexual offenders in a meta-analysis by Seto and Lalumière (2004), but the research regarding the relation of child abuse to sexual recidivism has been more mixed. Treatment failure, which also loaded on this factor has been linked to sexual recidivism for both juveniles and adults (e.g., Hanson & Morton-Bourgon, 2004; Worling & Langstrom, 2002). Although items on the fourth factor, which are suggestive of impaired judgment and/or impulse control, have not emerged in research on juvenile sexual recidivism, they have emerged in research on adult sexual recidivism (e.g., Epperson et al., 1998).

The ultimate, required characteristic of a risk assessment tool is predictive accuracy. The JSORRAT-II performed very well with the development sample, as reflected by its area under the ROC curve of .89 (95% CI of .85 to .92) for juvenile sexual recidivism. In addition, the JSORRAT-II yielded a wide dispersion of juvenile sexual recidivism rates associated with JSORRAT-II scores categories, ranging from 1% to 82% with largely non-overlapping confidence intervals. More specifically, the JSORRAT-II identified nearly half of the sample with an extraordinarily low 1% rate of juvenile sexual recidivism. At the other end of the

spectrum, the JSORRAT-II identified approximately 15% of the sample with very significant rates of juvenile sexual recidivism (43% to 82%). If this general pattern holds up on validation, the JSORRAT-II has the potential to greatly inform a range of resource allocations decisions regarding placement, programming, and treatment. In other words, valuable resources once invested across all juveniles, including those in the lowest risk categories, could be diverted to those juveniles requiring the most intense placements and treatments. In addition, the pattern described above demonstrates the potential of the JSORRAT-II to identify low risk adolescents that should be segregated from higher risk adolescents.

One potential limitation of our study was the inclusion of older adolescents (age 17 to 18 at the time of the index sexual offense) in our sample because they would have been at risk for juvenile sexual recidivism for only a very short time. However, the potential impact of their inclusion was assessed by redoing all analyses of juvenile sexual recidivism using only those people in our sample who were under age 17 at the time of the index sexual offense, and then redoing the analyses again for those people in our sample who were under age 16 at the time of their index sexual offense. Although these restrictions slightly elevated the juvenile sexual recidivism base rate from 13.2% to about 16%, the resulting areas under the ROC curve and the rates of juvenile sexual recidivism associated with JSORRAT-II score categories were extremely similar to those for the full sample. Consequently, the inclusion of older adolescent in the sample does not appear to have significantly altered the results related to juvenile sexual recidivism.

The predictive accuracy of the JSORRAT-II with adult sexual recidivism in the development sample was considerably lower than that for juvenile sexual recidivism. The area under the ROC curve for adult sexual recidivism with the full sample was only .64, and that

value increased to .72 when offenders who were over age 16 at the time of their index offense were excluded from analyses, reflecting a moderate level of predictive accuracy. This lower level of accuracy with adult sexual recidivism is not surprising, given that the JSORRAT-II was developed on and optimized for juvenile sexual recidivism.

These results do, however, seriously call into question the possibility of making life-long predictions based on risk assessments of juveniles. Not only were the areas under the ROC curve much lower for adult sexual recidivism than for juvenile sexual recidivism, so were the adult sexual recidivism base rates and the recidivism rates associated with the five score categories (see Table 6). As indicated in Table 6, rates of adult sexual recidivism do not exceed single digits until a score of 8 or higher. More specifically, approximately 86% of the development sample scored below 8 on the JSORRAT-II, meaning that the rate of adult sexual recidivism for this large group was at or below the base rate of 9%. The remaining approximately 14% of the sample sexually recidivated as adults at about a 24% rate.

Admittedly, the offenders in our sample have only been followed into young adulthood, on average until age 27. However, based on the adult sexual recidivism rates in our sample and the degree of accuracy achieved in predicting adult sexual recidivism, it would be extraordinarily difficult to justify the imposition long-term sanctions or sanctions with long-term negative consequences to the juvenile. This would be particularly the true when there are no empirically documented, major benefits to society from those sanctions. Prescott (2004) and Worling (2003) have argued that juvenile sexual offender risk assessments should have an expiration date. Our data suggest that, with rare exceptions, this date should be no later than age 18 unless more accurate predictive tools become available for juvenile sexual offenders.

The planned second step of the research program is to validate the JSORRAT-II with an independent sample that is large and representative of the broad spectrum of juveniles who offend sexually, both within Utah and other states. Conclusions about the performance of the JSORRAT-II must remain tentative until it has been successfully validated. Given the sampling methods used and the strong indices of predictive accuracy for juvenile sexual recidivism achieved in the development sample, we would expect that a validation in Utah with a similar sample would be successful, though with some shrinkage in the indices of predictive validity. However, this remains an unproven assumption until the validation study is completed.

The probability of successful validation studies with samples from other states is more difficult to estimate for a variety of reasons. As Caldwell (2002) and Miner (2002) noted, past studies intended to identify risk factors for juvenile sexual recidivism produced inconsistent results. Presumably, at least some of this past inconsistency in findings is due to the studies being conducted in different locales and with different populations. This observation certainly would question the likelihood of the risk factors identified in our research being successfully replicated with a sample from a different state. However, many of those past studies were based on relatively small samples of convenience, often from treatment centers, which introduced considerable potential bias and error. Consequently, the failure of risk factors to replicate across studies may be due more to small and biased samples rather than to systematic differences in juvenile sexual offenders, broadly speaking, across states. Because our sample was large ($N = 636$) and sampled the full range of sexual offending, we are hopeful that our findings might prove to be more robust.

In addition, several of the variables on the JSORRAT-II have been found to be associated with sexual recidivism in at least one other study. These include total number of adjudications

for sexual offenses (Långström, 2002; Schram, Milloy, & Rowe, 1991), number of sexual offense victims (Långström, 2002; Rasmussen, 1999; Worling, 2002), sexual offender treatment status (Worling & Curwen, 2000), child sexual abuse (Rasmussen, 1999; Rubinstein, Yeager, Goodstein, & Lewis, 1993), and number of adjudications for non-sexual offenses (Knight & Prentky, 1993; Prentky & Knight, 1993). Several other variables on the JSORRAT-II have been associated with juvenile sexual offending in general or included on other risk assessment tools. These include special education placement or learning problems (Kahn & Chambers, 1991) and school behavior problems (Knight & Prentky, 1993; Prentky et al., 2000; Schram et al., 1991).

Although there are some reasons to be optimistic about the successful replication of results in different states, as summarized above, there are also some reasons for pessimism. Our sample was large and representative of the full range of sexual offending, but it also was drawn entirely within the state of Utah. As a result, juveniles of color comprised only 14.0% of our sample (ethnicity was unspecified for another 9.6% of the sample), so the sample was predominantly Caucasian. Although we did not collect data on religious background, the demographics of Utah strongly suggest that the majority of our sample came from Mormon (Church of Jesus Christ of Latter Day Saints) families, another way in which Utah is systematically different from many other states. In our opinion, the greatest potential threat to the generalizability of our findings is the likely jurisdictional differences across states in the way that juvenile sexual offenses are charged, adjudicated, and disposed. Jurisdictional differences across counties in Utah are fully represented within our sample, so that is not the issue; rather, differences across states are the potential issue. We are encouraged by the fact that adult actuarial risk assessment tools have proven to be fairly robust in this respect. However, it is our impression that jurisdictional differences across states are much greater for juvenile sexual

offenders than for adult sexual offenders. Ultimately, of course, the generalizability of our findings to other settings is an empirical question, one that we hope to answer through planned validation studies that have been initiated.

Some may view the absence of dynamic variables as a limitation of the JSORRAT-II. Indeed, it is a limitation in the sense that it limits the use of the JSORRAT-II to initial risk assessments used to inform level of programming, treatment, and placement/supervision, and it precludes the JSORRAT-II from being used as a measure of treatment outcome or modified risk. However, within the context of the risk assessment model introduced at the beginning of this chapter, this would be construed as an intended purpose rather than as a limitation. The power of empirically identified, static variables to provide relatively long-term estimates of risk with adult sexual offenders is well documented (e.g., Hanson & Morton-Bourgon), and there is reason to believe that they can do the same for adolescents, though the term may be shorter. The use of validated measures of risk to inform programming, treatment, and placement/supervision decisions permits better utilization of resources by matching the duration and intensity of interventions and placements, with needs assessments providing focus, and prevents contagion effects by segregating lower risk juveniles from higher risk juveniles. Interventions must target specific goals, and research must link the achievement of those goals to risk reduction, eventually quantifying risk reduction, or modified risk. Ultimately, research on treatment outcomes and risk reduction may produce a single instrument that can be used for both initial and modified risk assessment with juveniles. Until that time, the best tools available for initial risk assessment should be used to inform treatment, and resources should be devoted to developing more refined measures of treatment outcomes and their relationship to risk.

In conclusion, the JSORRAT-II is a promising juvenile sexual recidivism risk assessment tool that performed very well in the development sample. However, it has not yet been validated with an independent sample. Until it has been successfully validated, the JSORRAT-II should be used only for research and to experimentally and tentatively inform treatment and programming decisions; it should not be used to inform forensic decisions. A copy of the JSORRAT-II scoring guidelines and a score recording sheet are attached as an appendix to this chapter to facilitate research on the JSORRAT-II and to permit its appropriate experimental use in clinical settings.

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Table 1**Selected Variables from the Ten Families and Their Bivariate Relations with Juvenile Sexual Recidivism**

Variable	Total N	Sex Recid. N	Sex Recid. %	X^2	<i>p</i>
Sexual Offending History					
** Number of juvenile sexual offense adjudications				72.56	<.0005
One	452	28	6.2%		
Two	118	31	26.3%		
Three	37	13	35.1%		
Four or more	29	12	41.4%		
** Duration of charged sexual offending history				113.33	<.0005
0 Months (only one charge)	416	22	5.3%		
0.01 to 5.99 months	144	25	17.4%		
6.00 to 11.99 months	27	10	37.0%		
12.00 or more months	49	27	55.1%		
** Was any charged sexual offense committed under supervision?				23.38	<.0005
No	505	50	9.9%		
Yes	131	34	26.0%		
** Number of victims in charged sexual offenses				55.54	<.0005
One	442	30	6.8%		
Two	116	28	24.1%		
Three or more	78	26	33.3%		
Number of juvenile sexual offense charges				75.05	<.0005
One	416	22	5.3%		
Two	130	30	23.1%		
Three	43	13	30.2%		
Four or more	47	19	40.4%		
Sexual Offense Characteristics					
** Was any felony-level, charged sexual offense committed in a public place?				24.26	<.0005
No	523	53	10.1%		
Yes	113	31	27.4%		
** Was any charged sexual offense preceded by deception or grooming?				18.55	<.0005
No	506	52	10.3%		
Yes	130	32	24.6%		
** Number of different location categories in which charged sexual offenses occurred				44.65	<.0005
One	549	53	9.7%		
Two	67	23	34.3%		
Three or more	20	8	40.0%		

Table 1 (Continued)

Variable	Total N	Sex Recid. N	Sex Recid. %	χ^2	<i>p</i>
* Pattern of multiple acts and multiple event contacts				12.92	<.0005
Neither	282	22	7.8%		
One or both	354	62	17.5%		
Number of different relation groups offended against in felony level sex offenses (sibling group, extended family/friends/classmates, stranger/acquaintance)				34.40	<.0005
One	315	28	8.9%		
Two	294	43	14.6%		
Three	27	13	48.1%		
Gender of victims in charged sexual offenses				9.37	<.009
Exclusively female victims	441	57	12.9%		
Exclusively male victims	75	9	12.0%		
Both male and female victims	58	16	27.6%		
Use of force/threat of force in charged sexual offenses				11.06	<.001
No	413	41	9.9%		
Yes	223	43	19.3%		
Did the offender ever perpetrate a charged sexual offense alone or as the leader of a group?				13.85	<.0005
No	185	10	5.4%		
Yes	451	74	16.4%		
Mental Health Diagnoses					
** Was the offender ever diagnosed with a self- regulatory disorder? (ADD, ADHD, Impulse Control, Conduct, or Oppositional Defiant Disorder)				26.89	<.0005
No	478	44	9.2%		
Yes	158	40	25.3%		
Was the offender ever diagnosed with an affective disorder? (Depression, Anxiety, Bipolar, PTSD)				19.44	<.0005
No	508	52	10.2%		
Yes	128	32	25.0%		

Table 1 (Continued)

Variable	Total N	Sex Recid. N	Sex Recid. %	X^2	p
Sexual Offender Specific Treatment History					
** Sexual offender treatment program status prior to index offense				114.62	<.0005
Never entered	584	53	9.1%		
Entered and completed all	26	12	46.2%		
Entered and did not complete at least once	26	19	73.1%		
** Offender's level of denial for index offense at discharge				24.15	<.0005
No denial	478	45	9.4%		
Denies, minimizes impact, or claims consensual	158	39	24.7%		
* Sexual Offender Treatment for Index Offense				33.53	<.0005
Never entered	353	33	9.3%		
Entered and completed	174	18	10.3%		
Entered and did not complete	109	33	30.3%		
Prior and index sexual offender treatment failures				84.83	<.0005
No SO treatment failures	516	44	8.5%		
Failed prior or index but not both	105	28	26.7%		
Fail both prior and index	15	12	80.0%		
Abuse History					
** Number of hands-on sexual abuse incidents experienced as the victim (official-report)				41.11	<.0005
None	533	52	9.8%		
One to four times	77	20	26.0%		
Five or more times	26	12	46.2%		
** Number of incidents of physical abuse experienced as the victim (official report)				27.94	<.0005
None	537	61	11.4%		
One to four times	84	14	16.7%		
Five or more times	15	9	60.0%		
Special Education History					
** Did the offender receive any special education placements in K-12?				45.26	<.0005
No	454	34	7.5%		
Yes	182	50	27.5%		
Discipline Problems in School					
** Number of different educational periods with discipline problems (elementary, middle school, high school)				27.13	<.0005
None or one	481	45	9.4%		
Two	109	25	22.9%		
Three	46	14	30.4%		

Table 1 (Continued)

Variable	Total N	Sex Recid. N	Sex Recid. %	χ^2	<i>p</i>
Non-Sexual Offending History					
** Number of juvenile adjudications for non-sexual offenses				15.86	<.0005
None or one	333	27	8.1%		
Two or more	303	57	18.8%		
Family Instability					
** Did the offender experience physical separation from biological or adoptive parents prior to age 16?				42.40	<.0005
No	509	45	8.8%		
Yes	127	39	30.7%		
** Severe difficulty relating to siblings (no sibs=no)				27.70	<.0005
No	468	42	9.0%		
Yes	168	42	25.0%		
Severe difficulty relating to parents				29.19	<.0005
No	536	54	10.1%		
Yes	100	30	30.0%		
Mental Health Treatment History					
* Mental health treatment status prior to index offense				17.52	<.0005
None	486	52	10.7%		
Completed all	122	22	18.0%		
Did not complete at least one	28	10	35.7%		

* Variables with one asterisk made a unique contribution to the prediction of juvenile sexual recidivism relative to other variables in the same family

** Variables with two asterisks made a unique contribution to the prediction of juvenile sexual recidivism relative to other variables in the same family and also contributed uniquely beyond the sex offending history variable family (or were in that family)

Note. Variables without an asterisk did not make a unique contribution to the predictions of sexual recidivism beyond the other variables in the same family

Table 2**Results of Hierarchical Logistic Regression Analyses with the Final Variable Families**

Block	Variable	Variable Wald χ^2 (df = 1)	p	Block χ^2	df	p
Sexual Offending History				108.05	6	.001
	Number of adjudications for juvenile sexual offenses, including index offense – linear effect	6.61	.010			
	Number of victims in charged sexual offenses – linear effect	3.90	.048			
	Number of victims – quadratic effect	3.73	.054			
	Number of victims – cubic effect	3.09	.079			
	Commission of a charged sexual offense while under supervision of the court	5.33	.021			
	Duration of charged sexual offending history	25.81	.001			
Sexual Offense Characteristics				17.69	2	.001
	Commission of a felony-level, charged sexual offense in a public place	8.81	.003			
	Use of deception or grooming in a charged sexual offense	8.07	.004			

Table 2 (Continued)

Block	Variable	Variable Wald χ^2 (df = 1)	p	Block χ^2	df	p
Child Abuse History				18.52	2	.001
	Number of officially documented, “hands-on,” sexual abuse incidents experienced as the victim	8.93	.003			
	Number of officially documented, physical abuse incidents experienced as the victim	4.79	.029			
Sexual Offender Treatment History				24.53	1	.001
	Completion status in prior sexual offender treatments	23.55	.001			
Special Education History				12.26	1	.001
	Any placement in special education	12.32	.001			
School Discipline History				4.39	1	.036
	Number of educational periods with discipline problems (elementary, middle school, high school)	4.46	.035			

Table 2 (Continued)

Block	Variable	Variable Wald χ^2 (df = 1)	p	Block χ^2	df	p
Non-Sexual Offending History				6.40	1	.011
	Number of adjudications for non-sexual offenses	6.16	.013			

Note. The Block X^2 is the test of the additive contribution of the current block relative to previous blocks in the prediction of juvenile sexual recidivism. The Wald X^2 statistic is the test of the unique contribution to the prediction of juvenile sexual recidivism for each variable relative to other variables in the same block and those in previous blocks.

Table 3**Categorical Scoring for the Final Twelve JSORRAT-II Variables**

Variable	<i>N</i>	Juvenile Sexual Recidivism Rate	Categorical Score
Number of juvenile sexual offense adjudications			
One	452	6.2%	0
Two	118	26.3%	1
Three	37	35.1%	2
Four or more	29	41.4%	3
Number of victims in charged sexual offenses			
One	442	6.8%	0
Two	116	24.1%	1
Three or more	78	33.3%	2
Length of charged sexual offending			
0 Months (only one charge)	416	5.3%	0
0.01 to 5.99 months	144	17.4%	1
6.00 to 11.99 months	27	37.0%	2
12.00 or more months	49	55.1%	3
Was any charged sexual offense committed while under supervision?			
No	505	9.9%	0
Yes	131	26.0%	1
Was any felony-level, charged, sex offense committed in a public place?			
No	523	10.1%	0
Yes	113	27.4%	1
Was any charged sexual offense preceded by deception or grooming			
No	506	10.3%	0
Yes	130	24.6%	1
Sexual offender treatment program status prior to index offense			
Never entered	584	9.1%	0
Entered and completed all	26	46.2%	1
Entered and did not complete at least once	26	73.1%	2

Table 3 (Continued)

Variable	Total N	Juvenile Sexual Recidivism Rate	Categorical Score
Number of "hands-on" sexual abuse incidents experienced as the victim (official-report)			
None	533	9.8%	0
One to four times	77	26.0%	1
Five or more times	26	46.2%	2
Number of physical abuse incidents experienced as the victim			
None	537	11.4%	0
One to four times	84	16.7%	1
Five or more times	15	60.0%	2
Did the offender receive any special education placement in K-12?			
No	454	7.5%	0
Yes	182	27.5%	1
Number of different educational periods with discipline problems (elementary, middle school, high school)			
None or one	481	9.4%	0
Two	109	22.9%	1
Three	46	30.4%	2
Number of juvenile non-sexual offense adjudications			
None or one	333	8.1%	0
Two or more	303	18.8%	1

Table 4**Potential Risk Categories for Juvenile Sexual Recidivism Based on Results from the Development Sample (*N* = 636)**

Potential Risk Level	Score Range	Number Scoring in Range (Selection Ratio)	Number Juvenile Sexual Recidivists	Percent Juvenile Sexual Recidivism	95% Confidence Interval for Recidivism Rates
Low	0 – 2	305 (48.0%)	3	1.0%	0.2% - 3.1%
Moderately Low	3 – 4	137 (21.5%)	9	6.6%	3.2% - 12.5%
Moderate	5 – 7	107 (16.8%)	26	24.3%	16.7% - 33.7%
Moderately High	8 – 11	65 (10.2%)	28	43.1%	31.1% - 55.9%
High	12 +	22 (3.5%)	18	81.8%	59.0% - 94.0%

Table 5

Selections Ratios and Juvenile Sexual Recidivism Rates by Potential Risk Level for the Full Development Sample, for Offenders under Age 17 at the Index Sexual Offense (N = 524), and for Offenders under Age 16 at the Index Sexual Offense (N = 433)

Potential Risk Level	Score Range	Selection Ratio			Juvenile Sexual Recidivism Rate		
		Full Sample	Under Age 17 at Index Sex Offense	Under Age 16 at Index Sex Offense	Full Sample ^a	Under Age 17 at Index Sex Offense ^b	Under Age 16 at Index Sex Offense ^c
Low	0 – 2	48.0%	45.2%	43.6%	1.0%	1.3%	1.6%
Moderately Low	3 – 4	21.5%	21.9%	22.4%	6.6%	7.8%	7.2%
Moderate	5 – 7	16.8%	17.6%	18.9%	24.3%	25.0%	28.0%
Moderately High	8 – 11	10.2%	11.2%	10.6%	43.1%	47.5%	47.8%
High	12 +	3.5%	4.0%	4.4%	81.8%	85.7%	89.5%

^aJuvenile sexual recidivism base rate = 13.2% . Area under the ROC curve = .89.

^bJuvenile sexual recidivism base rate = 15.5% . Area under the ROC curve = .88.

^cJuvenile sexual recidivism base rate = 16.6% . Area under the ROC curve = .88.

Table 6

Adult Sexual Recidivism Rates by Potential Risk Level for the Full Development Sample, for Offenders under Age 17 at the Index Sexual Offense (N = 524), and for Offenders under Age 16 at the Index Sexual Offense (N = 433)

Potential Risk Level	Score Range	Adult Sexual Recidivism Rate		
		Full Sample ^a	Under Age 17 at Index Sex Offense ^b	Under Age 16 at Index Sex Offense ^c
Low	0 – 2	5.9%	3.0%	3.2%
Moderately Low	3 – 4	6.6%	6.1%	7.2%
Moderate	5 – 7	9.3%	7.6%	8.5%
Moderately High	8 – 11	23.1%	20.3%	17.4%
High	12 +	27.3%	28.6%	33.3%

^aAdult base rate = 9.1%. Area under the ROC curve = .64.

^bAdult base rate = 7.4%. Area under the ROC curve = .73.

^cAdult base rate = 7.9%. Area under the ROC curve = .72.

Table 7

Rotated Four-Factor Structure for the JSORRAT-II Items

JSORRAT-II Item	Factor			
	1	2	3	4
1. Number of adjudications for sexual offenses	.882	.035	.044	.036
2. Number of victims in charged sexual offenses	.793	.012	.067	.213
3. Length of sexual offending history based on charged sexual offenses	.858	.105	.098	.041
4. Commission of a charged sexual offense while under supervision	.273	.686	-.087	-.119
5. Commission of a charged felony-level sexual offense in a public place	.176	-.019	.003	.797
6. Use of deception or grooming in a charged sexual offense	.032	.060	.081	.610
7. Prior sexual offender treatment status	.376	.005	.473	.059
8. Number of officially-documented "hands-on" sexual abuse incidents	.106	.033	.754	.123
9. Number of officially-documented physical abuse incidents	-.055	.214	.777	-.030
10. Placement in special education	.071	.590	.243	.290
11. Number of educational periods with discipline problems	-.058	.705	.217	.103
12. Number of adjudications for non-sexual offenses	-.043	.762	.007	-.058

Note. Extraction method was principal components. Varimax rotation with Kaiser normalization was used.

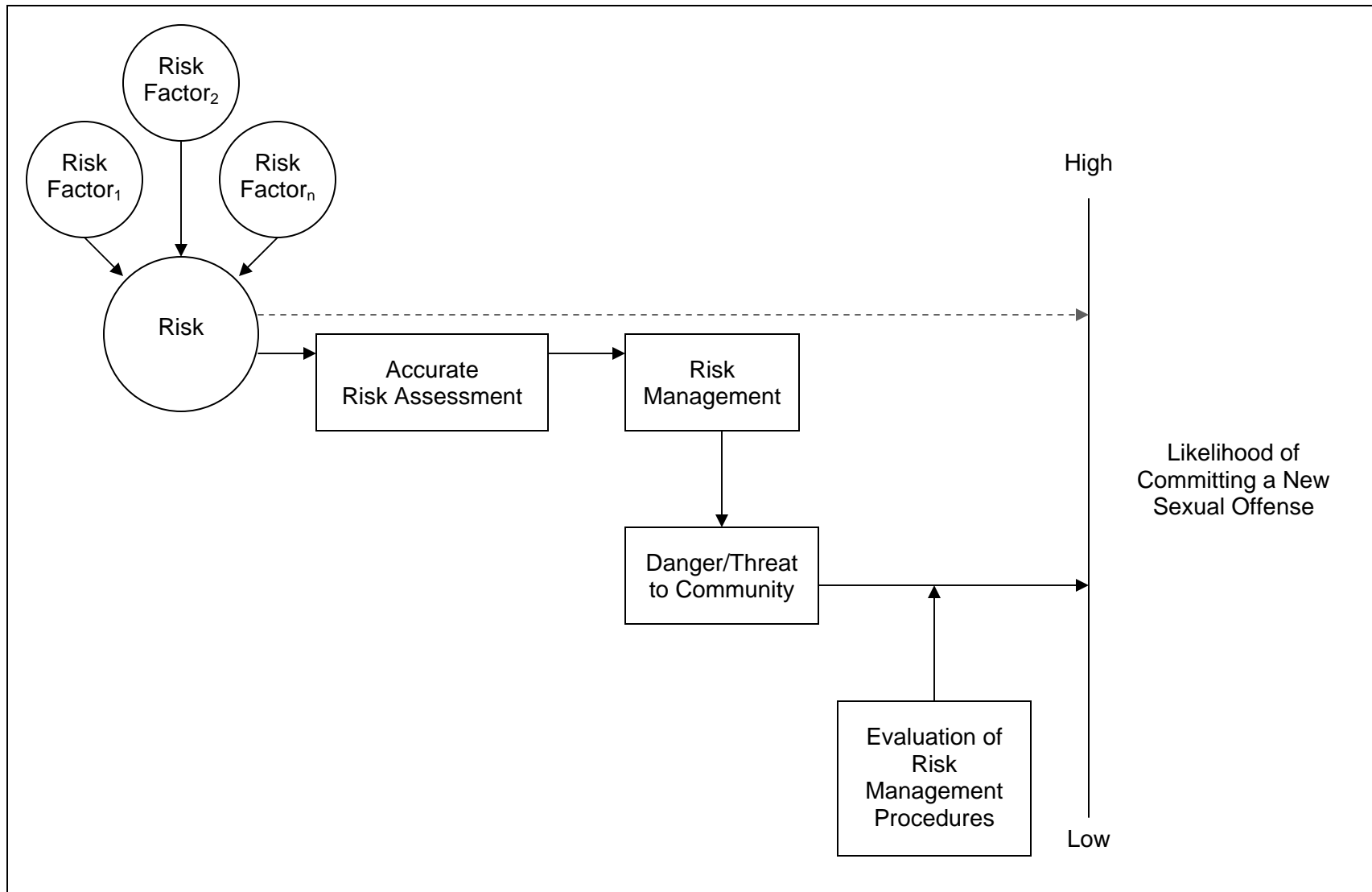


Figure 1. Accurate risk assessment is a prerequisite for reducing the danger/threat to the community, relative to risk, through effective risk management (note that the effectiveness of risk management procedures must be evaluated)

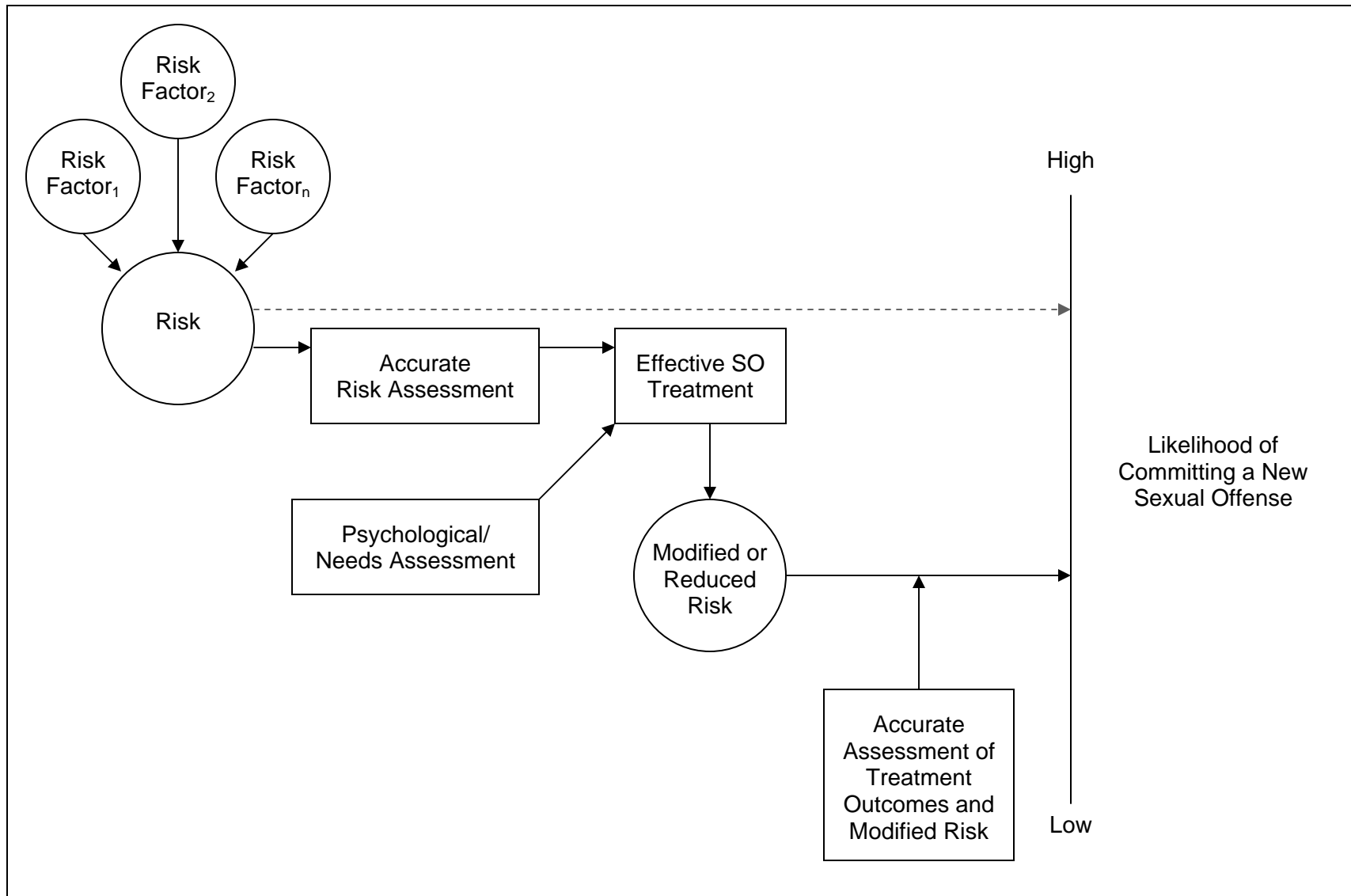


Figure 2. Accurate risk assessment is a prerequisite for effective treatment to reduce risk (note that accurate measures of treatment outcomes and resulting reductions in risk would be required to assess the modified level of risk)

Observed Outcome	Predicted Outcome		Row Totals
	Non-Recidivist (Low Risk)	Recidivist (High Risk)	
Non-Recidivist	537	15	552
Recidivist	44	40	84
Column Totals	581	55	636
Measures of Predictive Accuracy			
Positive Predictive Power = .73 [40 / 55]		Sensitivity = .48 [40 / 84]	
Negative Predictive Power = .92 [537 / 581]		Specificity = .97 [537 / 552]	
		Overall Accuracy = .91 [(537+40) / 636]	

Figure 3. Classification table of predicted juvenile sexual recidivism cross tabulated with observed juvenile sexual recidivism and various measures of predictive accuracy for the logistic regression model using a probability cut score of .50.

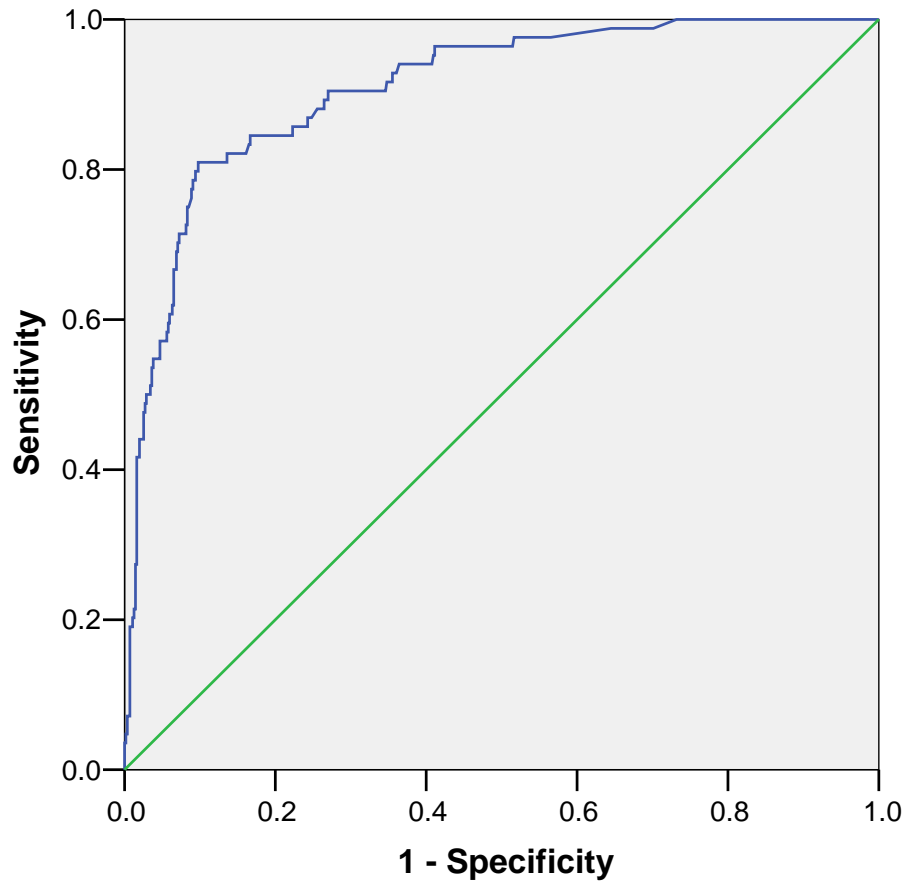


Figure 4. ROC curve for the full regression model (area under the curve = .91).

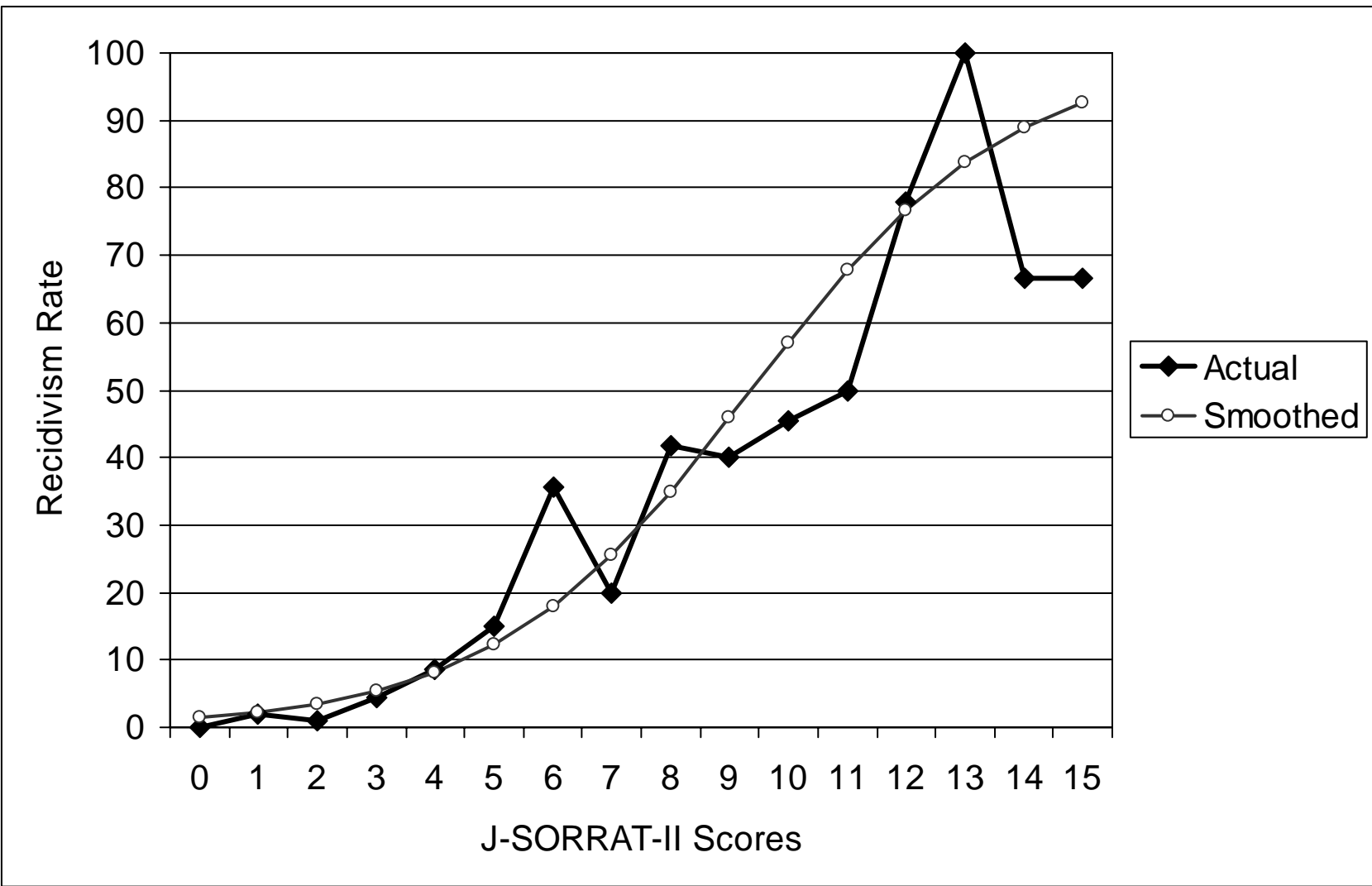


Figure 5. JSORRAT-II Scores and Associated Juvenile Sexual Recidivism Rates

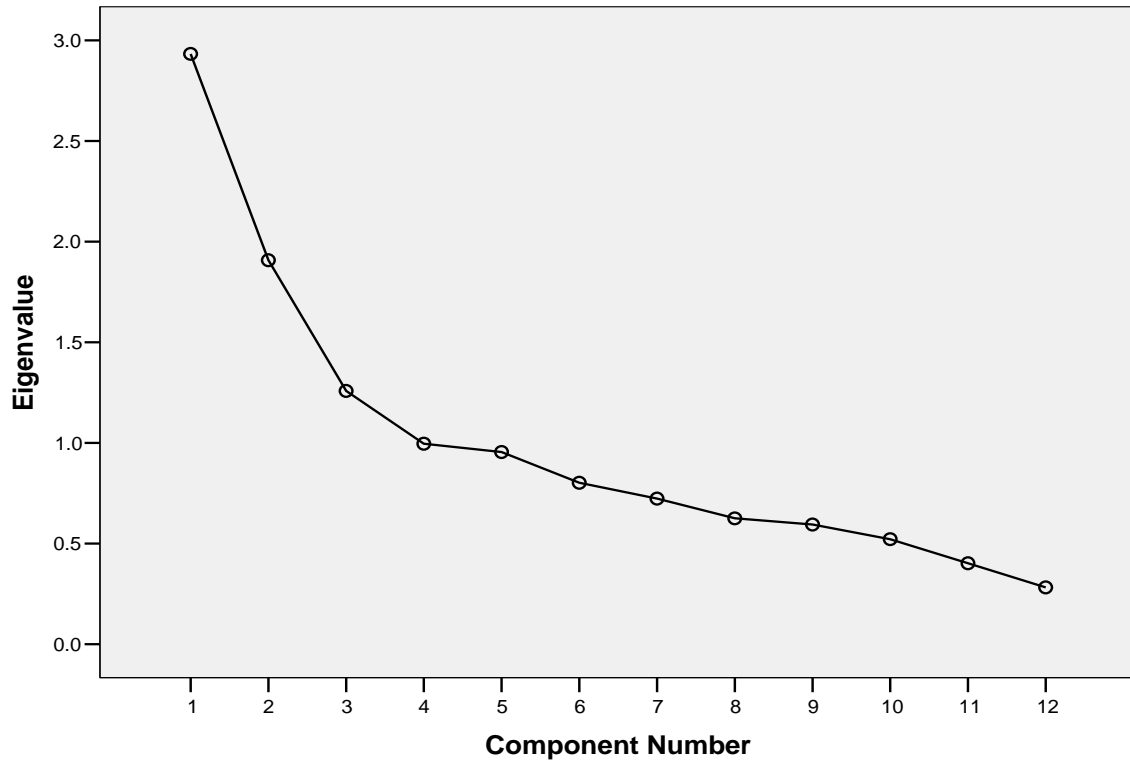


Figure 6. Scree plot for the exploratory components analysis of the 12 JSORRAT-II Items

Appendix A

JSORRAT-II Scoring Guidelines and Score Recording Sheet

**Scoring Guidelines for the
Juvenile Sexual Offense
Recidivism Risk
Assessment Tool – II
(JSORRAT – II) ©**

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General Instructions

The JSORRAT-II is a sexual recidivism risk assessment tool designed for juvenile male sexual offenders between the ages 12.0 to 17.99 years at the time of their index (most recent) sexual offense. Juveniles age 16 or older at the time of their index sexual offense who score in the low risk range on the JSORRAT-II may benefit from a secondary screen.

- The JSORRAT-II was designed to be scored based on a file review, so it is critical that the entire case file be reviewed before scoring the JSORRAT-II.
- Use only official documents in the case file as data sources in scoring the JSORRAT-II. Do not use information that is not documented in the file.
- Score all items unless there is insufficient data in the file for even a reasonable approximation. Items that cannot be scored because of missing data should be counted as a zero when computing the total score for the JSORRAT-II.
- For items 1 through 6, only sexual offenses for which the person was charged are counted. Sexual offenses are defined as all sexual offenses by statute and include charges for attempted sexual offenses and conspiracy to commit a sexual offense.
 - Item 1 additionally requires that the sexual offense be adjudicated
 - Item 5 additionally requires that the sexual offense charge be for a felony level (“hands-on”) sex offense.

Revised 6-3-2005

ITEM 1

Number of adjudications for sexual offenses including the current adjudication:

One	0
Two	1
Three.....	2
Four or More	3

Scoring Criteria

Count all sexual offense charges that were adjudicated prior to age 18, including the most recent offense. Include all adjudications regardless of level (e.g., misdemeanor, felony). Also, include adjudications for attempted sexual offenses or for conspiracy to commit a sexual offense prior to age 18. This item is based on a simple count of official adjudications for sexual offenses prior to age 18. The number of discrete events or victims is not relevant to this item, just the number of adjudications for sexual offenses.

Examples

1. A juvenile has a record of one misdemeanor-level adjudication for sexually lewd behavior and one felony-level adjudication for sexual abuse of a child less than age 14. *Count as two adjudications, score as 1.*
2. A juvenile was charged with four counts of felony-level sexual abuse of a child, but reached a plea agreement. According to the terms of the plea, he was adjudicated for only two counts. *Count as two adjudications, score as 1.*
3. A juvenile was adjudicated for one felony-level sexual abuse of a child, but during the course of treatment he disclosed three other offenses. None of the additional offenses were charged or adjudicated. *Count as one adjudication, score as 0.*
4. A juvenile has a record of one felony-level adjudication based on the sexual assault of three victims. *Count as one adjudication, score as 0.*
5. A juvenile was adjudicated for two felony-level sexual offenses based on six discrete sexual molestations of the same victim. *Count as two adjudications, score as 1*

ITEM 2

Number of different victims in charged sexual offenses:

One	0
Two	1
Three or More	2

Scoring Criteria

Count the number of different victims in charged sexual offenses perpetrated by the juvenile sex offender (JSO), including the current offense. The number of distinct victims is what is counted for this item; the number of charges, adjudications, or event contacts is not relevant. For “hands-on” charged sexual offenses, count each discrete victim that was offended against. However, if the JSO was charged with a “hands-off” exposure offense (e.g., “mooning”) in which a large number of people witnessed the exposure, count as only one victim for each such offense. Do not count self-report or alleged victims if the incidents did not result in an official charge.

Examples

1. A JSO was charged with misdemeanor lewdness after exposing his posterior to several cars passing him by. As many as 10 people witnessed this offense. ***Count as one victim, score as 0 (note that the charge was for a “hands-off,” exposure offense).***
2. A JSO was charged and adjudicated for an incident in which the he fondled two children that he was babysitting. ***Count as two victims, score as 1.***
3. A JSO has a record of four charges for “hands-on” sexual offenses against two different victims on multiple occasions. ***Count as two victims, score as 1.***
4. During the course of individual, sexual offender specific treatment, a JSO divulged that he had two additional victims for which he was not charged. His only officially charged sexual offense involved one victim. ***Count as one victim, score as 0 (note that only victims of officially charged offenses are counted).***
5. A JSO has two charges for exposing himself to a group of children on a playground and for exposing himself to another group of children at the library two months later. ***Count as two victims and score as 1 (note that these are two discrete events and charges with only one victim counted for each event because of the offense being a “hands-off” exposure offense).***

ITEM 3

Length of sexual offending history based upon time between the charge date for first sexual offense and the charge date for the last sexual offense:

Zero time (only one charge)	0
0.01 to 5.99 months.....	1
6.00 to 11.99	2
12 or more months	3

Scoring Criteria

This item reflects the duration of officially charged sexual offending behavior. Determine the dates of the first sexual offense charge and the most recent sexual offense charge. Calculate the number of full months between the two dates. For example, if the difference between the two dates is 8 months and 17 days, this would be counted as 8 months. If the offender only has one official sexual offense charge, score this item as zero. Do not count self-reported or alleged sexual offenses that did not result in an official charge.

Examples

1. A juvenile was charged for his first sexual offense November 6, 2001, and the date of his most recent sexual offense was April 30, 2002. The exact difference is 5 months and 24 days. ***Count as 5.0 months, score as 1.***
2. A juvenile was charged for his first sexual offense on June 4, 2002, but that charge did not result in an official adjudication. His only other sexual offense, which is his most recent offense, was charged on January 18, 2005. ***Count as 31 months, score as 3 (note that this item does not require a charge be adjudicated).***
3. A juvenile self-reported a sexual offense that occurred in October 2003, but that sexual offense was never charged. His only other sexual offense that resulted in an official charge was his index offense, which was charged on July 17, 2004. ***Count as zero months, score as 0 (note that uncharged offenses are not counted in this item, so this JSO only has one charged sex offense).***

ITEM 4

Was the juvenile sexual offender under any form of court-ordered supervision when he committed any sexual offense for which he was subsequently charged?

No..... 0

Yes..... 1

Scoring Criteria

Score “Yes” if the JSO committed any sexual offense (for which he was subsequently charged), including the current offense, while under some form of court-ordered supervision. Supervision includes probation, incarceration in a detention center or half-way house, or placement in a treatment facility. Note that the court-ordered supervision does not have to be the result of previous sexual offense adjudications. Only a charge for a sexual offense committed while under supervision is necessary for a score of “Yes” on this item; an adjudication is not required. Do not include self-reported sexual offenses that did not result in a formal charge.

Examples

1. A juvenile committed a misdemeanor-level sexual offense while still on probation for a previous shoplifting offense. He was officially charged for the sexual offense. *Count as “Yes,” score as 1.*
2. While at a residential treatment facility, a juvenile committed a felony-level sexual offense against another resident and was subsequently charged for that offense. *Count as “Yes,” score as 1.*
3. A juvenile was incarcerated in a juvenile detention facility after the adjudication of a felony assault charge. While incarcerated, he sexually assaulted a detention facility worker. *Count as “Yes,” score as 1.*
4. A juvenile self-reported committing sexual offenses while on probation for a previous sexual offense. However, none of these offenses were charged. *Count as “No,” score as 0.*

ITEM 5

Was any charged felony-level (“hands-on”) sexual offense committed in a public place?

No..... 0

Yes 1

Scoring Criteria

Score “Yes” if the JSO was charged for any felony-level (“hands-on”) sexual offense, including the current offense, where any part of the sexual activity occurred in a public place. A public place is defined as any area that is built and maintained for the general public, generally accessible by people in the community, or is open to the scrutiny of others. Examples of public places include schools, workplaces, parks, vacant lots, offenders or victim’s yards, public restrooms, and vehicles located in public places. Do not score “Yes” if the charged offense was a misdemeanor-level (“hands-off”) sexual offense.

Examples

1. A juvenile was charged with felony-level sexual assault that occurred in a restroom at a park. *Count as “Yes,” score as 1.*
2. A juvenile was charged with felony-level sexual assault after luring the victim from a playground into his home with the promise of playing video games. The actual assault occurred in the home. *Count as “No,” score as 0 (note that all of the sexual activity occurred in the perpetrator’s home).*
3. A juvenile was charged with felony-level sexual abuse of a child for an offense that occurred in the yard of a friend’s house. *Count as “Yes,” score as 1.*
4. A juvenile was charged felony-level sexual assault in the victim’s room at a residential treatment unit. *Count as “Yes,” score as 1 (note that all areas of a state treatment or correctional facility are considered public places).*
5. A juvenile was charged for a misdemeanor-level exposure offense (“mooning”) while at an outdoor public swimming pool. *Count as “No,” score as 0 (note that only felony-level (“hands-on”) sexual offenses are counted on this item).*
6. A juvenile was charged with felony-level sexual abuse for an offense occurring in an apartment complex corridor. *Count as “Yes,” score as 1 (note that, although an apartment unit itself is a private place, the common corridor is a public place).*

ITEM 6

Did the offender engage in deception or grooming of the victim prior to any charged sexual offense?

No..... 0

Yes..... 1

Scoring Criteria

Score “Yes” if the JSO was charged for any sexual offense, including the current offense, that involved deception and/or grooming. Deception may include the JSO misrepresenting his identity, the statements of an authority figure, or his responsibilities *vis a vis* the victim. Grooming behavior may include efforts to engage the victim through play activities, verbal enticements, or bribery.

Examples

1. A juvenile was charged with sexual abuse of a child after persuading a victim that they had permission from a parent figure to engage in a sexual act. ***Count as “Yes,” score as 1.***
2. A juvenile was charged with misdemeanor exposure after exposing his genitals to a younger child. The offense occurred after the perpetrator had invited the victim to play video games for several consecutive days in order to establish a relationship. ***Count as “Yes,” score as 1.***
3. A juvenile was charged with sexual abuse of a child after promising to give his victim some gift in exchange for engaging in sexual acts. ***Count as “Yes,” score as 1.***
4. A juvenile was charged with sexual assault after forcibly assaulting a stranger at a party. ***Count as “No,” score as 0 (note that, although this is clearly a forcible assault, there is no indication of deception or grooming).***

ITEM 7

What is the JSO’s prior sexual offender specific treatment status?

- Never Entered 0
- Entered and Had No
Prior Treatment Failures..... 1
- Entered and Failed At Least
One Prior Treatment..... 2

Scoring Criteria

Determine if the JSO had ever entered sexual offender specific treatment or been mandated to participate in treatment prior to his current sexual offense adjudication. If the JSO has no history of such treatment or treatment mandate, score this item as “Never Entered.” If the JSO had entered all mandated sexual offender treatments and any number of additional sexual offender treatments prior to his current offense and did not fail any treatment, score this item as “Entered and Had No Prior Treatment Failures.” If the JSO entered any number of prior treatments and failed at least one treatment attempt, score this item as “Entered and Failed At Least One Prior Treatment.” Sexual offender specific treatment may include individual or group outpatient treatment or individual or group inpatient treatment where the primary focus of the treatment was sexual offending desires or behaviors. Treatment failures include refusing to enter mandated treatment, quitting or absconding from treatment, or being removed from treatment by staff. Do not count evaluations as treatment.

Examples

1. A juvenile entered and completed outpatient sexual offender specific treatment prior to the index offense, and that was his only mandated SO treatment. He had no other involvement in sexual offender treatment. **Count as “Entered and Completed All Prior Treatments,” score as 1.**
2. A juvenile was mandated to participate in sexual offender treatment as part of a prior sexual offense adjudication, but he refused to enter that treatment. **Count as “Entered and Failed At Least One Prior Treatment,” score as 2.**
3. A juvenile entered residential sexual offender treatment, but absconded during the course of treatment. **Count as “Entered and Failed At Least One Prior Treatment,” score as 2.**
4. The file did not document any mandate for sexual offender treatment and there was no evidence of treatment involvement in the file. **Count as “Never Entered,” score as 0.**

ITEM 8

Number of officially documented “hands-on” sexual abuse incidents where the JSO was the victim:

None.....	0
One to Four.....	1
Five or More	2

Scoring Criteria

Count all officially documented “hands-on” sexual abuse incidents where the JSO was the victim. Official documentation may include police, court, child protective services, or medical reports. Do not count self-reported victimization incidents that are not officially documented. “Hands-on” sexual abuse includes direct contact with the victim (incidents of exhibitionism would be excluded). Such acts may include fondling of the victim, forcing the victim to fondle the abuser, oral sex performed on the victim, forcing the victim to perform oral sex on the abuser, penetration of the victim’s anus, or forcing the victim to penetrate the abuser’s vagina or anus.

Examples

1. A JSO was the victim of an officially charged and adjudicated sexual violation by an adult relative. Though the perpetrator was charged with only one count, a police report indicated that the abuse had occurred on two occasions and involved oral sex on the victim. *Count as two incidents and score as 1.*
2. A JSO was the victim of several founded sexual abuse incidents. A child protective services report of the incidents indicated the perpetrator sodomized the JSO at least five times over the course of one year. *Count as five incidents and score as 2.*
3. A JSO was the victim of a single sexual abuse incident at a foster home that was officially reported to child protective services. Though the incident was founded, it did not result in an official charge. *Count as one incident and score as 1 (note that criminal charges are not required for the event to be considered to be officially documented).*
4. A JSO was the victim of an officially charged sexual abuse incident, in which his uncle exposed his genitalia to the JSO on at least four occasions. *Count as “None,” score as 0 (note that all offenses involved non-contact sexual abuse).*

ITEM 9

Number of officially documented incidents of physical abuse where the JSO was the victim:

None.....	0
One to Four.....	1
Five or More	2

Scoring Criteria

Count all officially documented physical abuse incidents where the juvenile sexual offender was the victim. Official documentation may include police, court, child protective services, or medical reports. Do not include self-reported victimization incidents that are not officially documented. Physical abuse must involve direct contact with the victim, but the severity of injury sustained by the JSO is irrelevant.

Examples

1. A JSO was the victim of physical abuse committed by his father for which the father was officially charged. Though the father was charged with only one count, a police report indicated that the abuse had occurred on two occasions and had resulted in several bruises to the JSO’s arms and back. ***Count as two incidents and score as 1.***
2. A JSO was the victim of several founded physical abuse incidents. A child protective services report of the incidents indicated the JSO’s mother had used a leather belt to severely punish her child on at least one dozen occasions. ***Count as 12 incidents and score as 2.***
3. A JSO was the victim of a single physical abuse incident perpetrated at a foster home that was officially reported to child protective services. Though the incident was founded, it did not result in an official charge. ***Count as one incident and score as 1 (note that criminal charges are not required for the event to be considered to be officially documented).***
4. There is no mention of child abuse anywhere in the file. ***Count as no incidents and score as 0.***
5. Although the JSO alleged that physical abuse had occurred, such abuse was not documented through official reports in the file. ***Count as no incidents and score as 0.***

ITEM 10

Does the JSO have a history of special education placement?

No..... 0

Yes..... 1

Scoring Criteria

Score “Yes” if the JSO was ever officially placed in a special education program. Special education placement may include assistance for educational, mental, or learning disabilities, emotional or behavioral disorders, or for reasons unknown, yet a history of special education was clearly documented.

Examples

1. A JSO was officially placed in a special education classroom for students with learning disabilities involving reading. *Count as “Yes,” score as 1.*
2. A JSO received official special education assistance for one hour per week as a result of a mathematical learning disability. *Count as “Yes,” score as 1.*
3. A JSO was officially classified as behaviorally disordered. *Count as “Yes,” score as 1.*
4. A JSO received additional assistance or tutoring at home or at an external agency, but there was no evidence of special education placement at school. *Count as “No,” score as 0.*

ITEM 11

Number of educational time periods with discipline problems (elementary school, middle school/junior high school, high school):

None or One.....	0
Two	1
Three.....	2

Scoring Criteria

Count the number of education time periods that the juvenile sexual offender had received any number of school disciplines for problematic behavior, as documented in the case file. The three educational time periods include elementary school, middle school or junior high, and high school. Behaviors that may have resulted in formal school discipline include non-sexual violence, sexual aggression, property offenses, oppositional behavior, verbal harassment, truancy, and other behavior problems noted but not specified.

Examples

1. In a probation report, the probation officer reported that the JSO had been suspended from high school for participating in a physical assault on another student. In a separate report of education progress provided to the court, a school attendance official reported that the JSO was frequently truant in middle school. ***Count as two time periods with disciplines, score as 1.***
2. In an education summary report, a school official reported that the JSO had been sent to the principal’s office after verbally harassing another student during his fifth-grade year. The report also indicated that this event was an isolated incident. ***Count as one time period with a discipline, score as 0.***
3. In a psychological assessment report, a psychiatrist reported communicating with school officials with regard to behavior problems the JSO had exhibited over the course of his schooling. The psychiatrist reported that school officials had disclosed that the JSO had pervasive oppositional problems that resulted in frequent disciplinary problems starting in the second grade and continuing to the present. At the time of the report, the JSO was in the eleventh grade. ***Count as three time periods with disciplines, score as 2.***
4. In a case file, nothing was mentioned about the JSO’s school performance or behavior patterns. ***Count as no time periods with disciplines, score as 0.***

ITEM 12

Number of adjudications for non-sexual offenses prior to the most recent (index) sexual offense:

None or One..... 0

Two or more 1

Scoring Criteria

Count all non-sexual criminal offenses for which the JSO was adjudicated prior to the JSO’s current (index) sexual offense adjudication. Non-sexual criminal offenses may include both misdemeanor and felony-level offenses that are not sexual offenses by statute.

Examples

1. A JSO had one petty theft adjudication that occurred six months prior to his current sexual offense adjudication. *Count as one, score as 0.*
2. A JSO was adjudicated for two felony assault charges one year prior to his current sexual offense adjudication. *Count as two, score as 1.*
3. The only adjudications that the JSO has on his record are for sexual offenses. *Count as none, score as 0.*

Juvenile Sexual Offense Recidivism Risk Assessment Tool-II (JSORRAT-II)

Score Recording Sheet

Name: _____		ID # _____	
1. Number of adjudications for sex offenses (including current adjudication): One..... 0 Two 1 Three 2 Four or more 3		7. Prior sex offender treatment status: Never entered 0 No prior treatment failures..... 1 At least one prior treatment failure 2	
2. Number of different victims in charged sex offenses: One..... 0 Two 1 Three 2		8. Number of officially documented incidents of hands-on sexual abuse in which the offender was the victim: None 0 One to four 1 Five or more 2	
3. Length of sexual offending history based on charged sex offenses: Only One Charge..... 0 1 Day to 5.99 Months 1 6.00 to 11.99 Months..... 2 12.00 Months or more 3		9. Number of officially documented incidents of physical abuse where the offender was the victim: None 0 One to four 1 Five or more 2	
4. Under any form of supervision when they committed any sex offense for which they were eventually charged? No..... 0 Yes 1		10. Any placement in special education? No..... 0 Yes..... 1	
5. Was any charged felony-level sex offense committed in a public? No..... 0 Yes 1		11. Number of education time periods with discipline problems: None or One..... 0 Two 1 Three..... 2	
6. Use of deception or grooming in any charged sex offense? No..... 0 Yes 1		12. Number of adjudications for non-sexual offenses: None or One..... 0 Two or More 1	
		TOTAL SCORE:	
Scorer: _____		Date: _____	