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PREDICTIVE VALIDITY OF THE STRUCTURED ASSESSMENT FOR VIOLENCE RISK IN YOUTH (SAVRY) WITH JUVENILE OFFENDERS

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Violence is a serious social problem that is often encountered in the youth justice system. Identifying those adolescents who are at the highest risk for future violence is an important step toward effective rehabilitation. The current study examined the predictive validity of the Structured Assessment for Violence Risk in Youth (SAVRY), a structured professional judgment risk tool, in a sample of 121 juvenile offenders. The SAVRY was found to have strong predictive validity, a finding that was robust across gender and ethnicity. The SAVRY obtained ROC values of .75 and .66 for general and violent recidivism, respectively, for 1 year, and values of .76 and .77 for general and violent recidivism, respectively, for 3-year follow-up. For nonviolent recidivism, the ROC values were .80 for 1-year and .68 during 3 years. Use of the SAVRY in the youth justice system, and limitations of the study, are discussed.

Keywords: violence risk assessment; juvenile offenders; SAVRY; recidivism; predictive validity

Youth violence is a major public health concern (Koop & Lundberg, 1992). For example, the rate of youth violence in Canada has recently stabilized but only after a dramatic increase of 77% between 1988 and 1998 (Statistics Canada, 1999). In 2000, Canadian adolescents aged 12 to 17 were responsible for 16% of all violent crimes and were more likely to commit violent crimes than adults (Statistics Canada, 2001). Moreover, this official data reflects a minority of actual youth violence, as most aggravated assaults, robberies, and rapes are never reported to the police and arrests are made in fewer than 50% of reported crimes (Cook & Laub, 2002; Snyder & Sickmund, 1999). Youth violence leads to huge personal costs to victims and drains significant government resources to finance police investigations, criminal hearings, and incarceration. In a study conducted in the United States, Cohen (1998) determined that $1.3 to $1.5 million would be saved if a single high-risk youth was prevented from becoming a career criminal. The need to prevent and intervene in youth violence is self-evident.

The first step in effective violence intervention, particularly with juvenile offenders, is to conduct a comprehensive risk assessment. Results from violence risk assessment provide

information to assist in decision making related to sentencing, probation, parole, or other graduated release decisions (Cottle, Lee, & Heilbrun, 2001). In addition, effective offender rehabilitation hinges on appropriate classification of an individual's criminogenic risk level and needs (Andrews, Bonta, & Hoge, 1990). Treatment of a chronic, high-risk young offender will likely require different and more intensive resources than a low-risk offender (Borum, 2003).

Violence risk assessment of adults has steadily improved over time. Currently, several instruments, such as the Historical Clinical Risk–20 (HCR-20; Webster, Douglas, Eaves, & Hart, 1997), the Violence Risk Assessment Guide (VRAG; Quinsey, Harris, Rice, & Cormier, 1998), the Sex Offender Risk Appraisal Guide (SORAG; Hanson & Bussiere, 1998), and the Spousal Assault Risk Assessment Guide (SARA; Kropp, Hart, Webster, & Eaves, 1999) have demonstrated moderate reliability and validity in determining violence risk in adults. However, research has been slower to address violence risk in adolescents (Borum, 2000). As a result, many professionals assess violence risk using unstructured clinical judgment or with assessment tools designed for adults.

The use of adult assessment tools with adolescents raises many ethical and clinical concerns. One particular concern is that adult assessment tools may contain items that do not apply well to adolescents, such as a youth's criminal or relationship history. Clinicians are faced with decisions about whether certain risk items should be altered or removed without knowing how reliability and validity of the tool may be affected. In addition, adult violence-risk tools tend to focus more on static, historical factors and place less emphasis on dynamic factors such as peer relations or environmental context (Borum, 2000). Adolescents simply do not have the same extensive history as found with adults. In light of this latter finding, it is important to consider the fact that individual risk factors may be less stable in adolescents because of ongoing rapid psychosocial development, when compared to adults (Borum, 2000; Borum & Verhaagen, 2006). Given the significant cognitive, emotional, social, and physical changes that occur during adolescence, assessment tools must be sensitive to developmental context (Hoge, 1999; Hoge & Andrews, 1996). This latter issue highlights the need for a specific assessment measure designed to assess violence risk in adolescents.

Two instruments currently in the field of youth risk assessment are the Youth Level of Service/Case Management Inventory (YLS/CMI; Andrews & Bonta, 1995) and the Psychopathy Checklist: Youth Version (PCL:YV; Forth, Kosson, & Hare, 2003). Research on the YLS/CMI is limited, but studies have shown that its total score and subscale scores significantly discriminate between offender and nonoffender groups (Costigan & Rawana, 1999; Jung & Rawana, 1999). Predictive validity correlations for recidivism have generally ranged from .25 to .36 (Schmidt, Hoge, & Gomes, 2005; Thompson & Putnins, 2003).

Research has shown that psychopathy, as defined by a score on the Psychopathy Checklist–Revised (PCL-R; Hare, 1991), is a robust predictor of general criminality and violent behavior in adults (Harris, Rice, & Cormier, 1991; Hemphill, Hare, & Wong, 1998; Salekin, Rogers, & Sewell, 1996). Although research with adolescents has been less extensive, youth scoring high on the PCL-R have been found to be at substantially higher risk for future recidivism and violence (Forth & Burke, 1998). Recent studies using the PCL-YV have yielded a range of effect sizes, with psychopathy being associated with both violent and general antisocial behavior in adolescents (Gray et al., 2003; Gretton, Hare, & Catchpole, 2004).

A newly developed instrument, the Structured Assessment for Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2002) is specifically intended to assist in the assessment

of violence risk in adolescents between the ages of 12 and 18. The SAVRY structure was modeled after the Historical Clinical Risk–20 (HCR-20; Webster et al., 1997), a tool that provides 20 historical, clinical, and risk-management variables empirically supported in the literature as correlates of violence. One item termed *psychopathy* was originally part of the measure but was changed to *low empathy and remorse*. The manual indicates that this was done to eliminate the need for specialized training to code this item and to make the SAVRY more user-friendly.

The SAVRY is based on the structured professional judgment model and contains 24 items drawn from the existing research on adolescent development and youth violence. The SAVRY risk items are grouped into three domains: Historical (10 items), Social/Contextual (6 items), and Individual/Clinical (8 items). The final SAVRY risk rating (*low*, *moderate*, or *high*) represents a structured judgment regarding the risk for future violence. Although the final risk ratings are not linked to specific scores or base rates in the population, empirical studies often find a linear relationship between the number of risk factors and violence risk (Borum et al., 2002). The aim of the SAVRY is to help professionals make an informed evaluation of violence risk that will aid intervention and management decisions. To this end, the SAVRY identifies dynamic and modifiable risk factors that can be targeted for intervention. By including dynamic risk factors, the detection of change with specific risk items and overall risk level is possible.

Research on the ability of the SAVRY to assess violence risk is in its early stages. However, a few studies have been published, and these results are promising. One study, done by Bartel, Forth, and Borum (2003), was a retrospective analysis of three population samples, two of which were incarcerated male adolescents and one of which was a community sample ($N = 220$). Violence was measured in terms of aggressive behavior while incarcerated as well as by violent behaviors related to the diagnosis of conduct disorder in the community. The risk ratings were quantified to enable statistical analysis. Institutional aggressive behavior and aggressive conduct-disorder symptoms were predicted by all three SAVRY risk domains and the SAVRY risk rating. The strongest associations were found for the SAVRY risk rating ($r = .40$ to $.52$) and for the Individual Domain ($r = .40$ to $.45$).

McEachran (2001) examined the ability of the SAVRY to predict violent recidivism in 108 male juvenile offenders, aged 18 to 21, who had completed their sentences. Violent recidivists scored significantly higher than nonrecidivists on the three SAVRY risk domains and the SAVRY risk rating. The nonviolent recidivists also scored significantly higher than the nonrecidivists on the SAVRY final risk rating and on all risk domains, except the Individual Domain. Interestingly, when violent and nonviolent recidivists were compared, only the Individual Domain distinguished between these two groups. The area under the curve (AUC) for violent recidivists was .70, indicating that the SAVRY had good predictive ability for violent recidivism.

A third available study on the SAVRY (Catchpole & Gretton, 2003) examined the forensic files of 63 incarcerated male and 11 incarcerated female adolescents. The follow-up recidivism period was 1 year after discharge and treatment. In this study, only the SAVRY final risk rating was compared to future convictions. The results indicated that the risk rating significantly predicted violent recidivism. Only 1 out of 17 juvenile offenders deemed to be low risk on the SAVRY violently reoffended during the follow-up period. In comparison, 8 out of 20 adolescents deemed high risk on the SAVRY violently reoffended.

The available studies conducted on the SAVRY represent positive contributions to the literature. However, several important limitations are noted in this small body of research.

First, only one study (Catchpole & Gretton, 2003) has included females and, even then, the sample size was small ($n = 11$). In addition, previous studies have focused solely on Caucasian youth, with varying follow-up periods. The present study contributes to the current information available on the SAVRY by examining predictive validity across gender and ethnicity and by exploring predictive validity during two follow-up periods (1-year and 3-year).

METHOD

PARTICIPANTS

The sample was taken from a larger group of consecutively court-referred juvenile offenders to a multidisciplinary mental health team including disciplines of psychology, psychiatry, and social work. Adolescent offenders ordered to have such assessments tend to be at higher risk for antisocial behavior and/or present with more complex mental health needs than the general population of juvenile offenders (Jack & Ogloff, 1997). Past research has suggested that such court-referred youths represent approximately 2% to 10% of all adolescent offenders (Jack & Ogloff, 1997). Twelve of the 133 adolescents were excluded from the sample either because of limited file information for archival coding of the SAVRY ($n = 3$) or because the available follow-up period was less than 1 year ($n = 9$). Therefore, participants for this study consisted of 121 juvenile offenders with a mean age of 14.90 years ($SD = 1.40$, range = 12.00 to 18.50). Eighty of the offenders were male (66%) and 41 (34%) were female. Reflecting the ethnic composition of the local community, 83 (69%) participants were Caucasian and 38 (31%) were Native Canadian, as defined by Native heritage of at least one parent. For the evaluation of nonviolent recidivism, the sample size is 87. This is a result of the youth who committed a violent reoffense ($n = 34$) being subtracted from the overall sample of 121.

MEASURES

SAVRY. The SAVRY is an assessment tool consisting of 24 risk items grouped into three domains: Historical (10 items), Social/Contextual (6 items), and Individual/Clinical (8 items). In addition, 6 items are contained under the heading of Protective Factors. Examples of items included on the SAVRY are violence history, poor school achievement, social support, peer delinquency, risk taking/impulsivity, and substance use. All of the risk items are rated on a 3-point scale (*low*, *moderate*, *high*). The protective factors are rated as either present or absent. Detailed instructions for coding each item are provided in the SAVRY manual. After the items are coded, an overall professional judgment of violence risk (*low*, *moderate*, *high*) is made.

Recidivism data. Recidivism data were obtained by accessing each youth's complete criminal records from the Royal Canadian Mounted Police (RCMP) national police registry. Reoffenses were classified as violent recidivism (VR) if they met criteria listed in the SAVRY manual and included offenses such as murder, manslaughter, attempted murder, assault, sexual assault, robbery, possession of a weapon, and arson. Nonviolent recidivism (NVR) included all other offenses. General recidivism (GR) was defined as any reoffense,

either violent or nonviolent, that resulted in conviction. The follow-up period to determine recidivism began immediately after disposition. If incarceration occurred, time spent in a correctional facility was deducted so that the follow-up period would reflect only time spent in the community.

PROCEDURE

Data were collected for each juvenile offender as part of a court-ordered standardized assessment procedure completed by a multidisciplinary mental health team from a children's mental health center. Using this existing file information, the SAVRY was coded for each youth by the current authors. Prospective studies are ideal, but previous research does support the use of file information in the retrospective scorings of risk tools when interviews are not practical (Campbell, Porter, & Santor, 2004). The SAVRY manual does not specify whether or not the rater should be the clinician who conducted the assessment. Prior to the archival coding of the SAVRY, 15 non-study files were coded for training purposes. For each youth, a quantitative total score and a final risk rating was given. A SAVRY item was not scored if insufficient information was available, but this was a rare occurrence. The maximum number of items that could not be coded for any case was two. The total score was determined by quantifying each item (*low* = 0, *moderate* = 1, *high* = 2) and adding all items, except those items, under the heading of Protective Factors. The final risk rating was made as a professional judgment based on the results of all of the SAVRY items. To ensure accuracy and consistency of coding for study files, interrater reliability estimates were calculated using 29 (24%) randomly selected youth from the sample. For the SAVRY risk domains, intraclass correlations (ICC), using a random one-way effect model for the single rater who coded all 121 files, were .96 for Historical, .89 for Social, and .92 for Individual. ICC's for the SAVRY total score and final risk rating were .97 and .95, respectively. All were statistically significant ($p < .001$).

RESULTS

DESCRIPTIVE STATISTICS

Risk classification. SAVRY total scores ranged from 2 to 40 (out of a possible range of 0 to 48). The mean SAVRY total score was 21.88 ($SD = 8.69$). For the SAVRY final risk rating, 34 (28%) adolescents were identified as low risk, 54 (45%) were identified as moderate risk, and 33 (27%) were identified as high risk. The mean score for each risk level were as follows: low ($M = 11.09$, range = 2 to 19), moderate ($M = 22.91$, range = 15 to 30), and high ($M = 31.33$, range = 26 to 40).

The overall MANOVA for SAVRY total score and the risk domains for males and females was nonsignificant, $F(3, 117) = 1.22$, $p = .31$. The overall MANOVA for SAVRY total score and the domains for Native Canadian and Caucasian youth was significant, $F(3, 117) = 5.74$, $p = .001$, $\eta_p^2 = .128$. Univariate analyses revealed that Native Canadian youth had significantly higher scores than Caucasian youth on the Historical Domain, $F(1, 119) = 9.46$, $p = .003$, $R^2 = .074$; Social Domain, $F(1, 119) = 12.41$, $p = .001$, $R^2 = .094$; and total score, $F(1, 119) = 8.34$, $p = .005$, $R^2 = .065$. No effect for ethnicity was found for the Individual Domain, $F(1, 119) = 1.09$, $p = .29$.

TABLE 1:   **Descriptive Statistics for General Recidivism, Violent Recidivism, and Nonviolent Recidivism by Total Sample, Gender, and Ethnicity for 3-year Follow-Up (%)**

	Total (n = 121)	Males (n = 80)	Females (n = 41)	Native Canadian (n = 38)	Caucasian (n = 83)
General recidivism	48.8	52.3	43.9	55.3	45.8.
Violent recidivism	28.1	32.5	19.5	44.7	20.5
Nonviolent recidivism	20.7	19.8	24.4	10.6	25.3

When males and females were compared on other demographic variables, no effect was found for age, $t(119) = .16$, $p = .69$, or ethnicity, $\chi^2(1, N = 121) = .78$, $p = .216$. For ethnicity, no difference between Native Canadian and Caucasian youth was found for age, $t(121) = .83$, $p = .37$.

Follow-up period and reoffending patterns. Recidivism data for two follow-up periods (1-year and 3-year) were used for analyses. For 1-year follow-up, all offenders had recidivism data for the full year. The 3-year follow-up period had an average length of 36.92 months ($SD = 13.53$, range = 12.0 to 61.0). Most of the offenders (79%) had follow-up periods of 2 years or more. Therefore, the 3-year follow-up period is actually a mean of about 3 years, though the majority of offenders had data for at least 2 years of follow-up. During follow-up, 59 (49%) of the adolescents committed a reoffense, 34 (28%) committed a violent reoffense, and 25 (21%) committed only a nonviolent offense. Of those who had any reoffense during follow-up, 65% committed the reoffense within 1 year; of those who violently reoffended during follow-up, 59% committed their violent reoffense within 1 year.

Descriptive statistics for GR, VR, and NVR, with analysis by total sample, gender, and ethnicity for 3-year follow-up, are presented in Table 1. The Bonferroni correction was used and significance for the 21 chi-square tests were evaluated at $p < .0024$. Chi-square analyses by gender were nonsignificant for GR, $\chi^2(1, N = 121) = .59$, $p = .44$; for VR, $\chi^2(1, N = 121) = 2.26$, $p = .13$; and for NVR, $\chi^2(1, n = 87) = .04$, $p = .84$. For ethnicity, no effect was found for GR, $\chi^2(1, N = 121) = .94$, $p = .33$; for VR, $\chi^2(1, N = 121) = 7.59$, $p = .006$; or for NVR, $\chi^2(1, n = 87) = 1.35$, $p = .25$.

PREDICTIVE VALIDITY ANALYSES

Receiver operating characteristics (ROC). ROC analyses were conducted to determine the predictive validity of the SAVRY total score. ROC curves are used to assess an instrument's ability to predict an event with a dichotomous outcome. ROC analyses produce a graph where sensitivity is plotted against specificity in the form of a curve. The AUC reflects the probability that an individual who recidivated will score higher on the measure than an individual who did not recidivate (Douglas & Webster, 1999). An AUC of .50 indicates that prediction is no better than chance, with an increasingly larger AUC value reflecting greater accuracy of prediction. For 1-year follow-up, AUC's were .75 (95% CI = .66 to .84) for GR; .66 (95% CI = .54 to .77) for VR; and .80 (95% CI = .68 to .91) for NVR. During the mean 3-year follow-up period, the SAVRY total score yielded AUC's of .76 (95% CI = .67 to .84) for GR; .77 (95% CI = .67 to .87) for VR; and .68 (95% CI = .57 to .80) for NVR.

TABLE 2:   Area Under the Curve (AUC) for Violent Recidivism by Total Sample, Gender, and Ethnicity for 3-Year and 1-Year Follow-Up

	AUC	SE	95% CI
3-year follow-up			
Total sample	.77	.05	.67-.87
Males	.78	.05	.68-.89
Females	.80	.11	.59-1.0
Native Canadian	.84	.08	.69-.98
Caucasian	.70	.07	.57-.83
1-year follow-up			
Total sample	.66	.06	.54-77
Males	.66	.07	.53-.79
Females	.68	.11	.46-.90
Native Canadian	.64	.10	.44-.83
Caucasian	.65	.07	.51-.79

In terms of gender and ethnic subgroups, AUC's for VR during 3-year follow-up ranged from .70 for Caucasian youth to .84 for Native Canadian youth. For 1-year follow-up, AUC's for VR ranged from .64 for Native Canadian youth to .68 for females. Table 2 presents results for these subgroups for both follow-up periods.

PREDICTIVE VALIDITY OF SAVRY RISK LEVELS

Chi-square analyses. The recidivism rates for the SAVRY risk ratings (*low*, *moderate*, *high*) for total sample, gender, and ethnicity are presented for GR, VR, and NVR, in Tables 3, 4, and 5, respectively. Chi-square analysis for GR during the 3-year follow-up period was significant for the total sample, $\chi^2(2, N = 121) = 20.46$, $p < .001$, $\phi = .41$. For GR during the 1-year follow-up period, chi-square analysis by risk level was significant for the total sample, $\chi^2(2, N = 121) = 19.59$, $p < .001$, $\phi = .40$.

For VR during a 3-year period, chi-square analyses were significant for the total sample, $\chi^2(2, N = 121) = 24.97$, $p < .001$, $\phi = .45$; for males, $\chi^2(2, n = 80) = 15.67$, $p < .001$, $\phi = .44$; and for females, $\chi^2(2, n = 41) = 14.14$, $p = .001$, $\phi = .59$; but were nonsignificant for Native Canadian youth, $\chi^2(2, n = 38) = 15.39$, $p = .003$; or for Caucasian youth, $\chi^2(2, n = 83) = 10.61$, $p = .01$. For VR during the 1-year follow-up period, chi-square analyses by risk level for were significant for the total sample, $\chi^2(2, N = 121) = 8.83$, $p = .01$, $\phi = .27$, but were nonsignificant for males, $\chi^2(2, n = 80) = 5.84$, $p = .05$; for females, $\chi^2(2, n = 41) = 3.45$, $p = .18$; for Native Canadian youth, $\chi^2(2, n = 38) = 4.00$, $p = .14$; and for Caucasian youth, $\chi^2(2, n = 83) = 4.60$, $p = .10$.

Looking specifically at NVR in a 3-year period, results were nonsignificant for total sample, $\chi^2(2, N = 86) = 3.17$, $p = .21$. For NVR during the 1-year follow-up period, chi-square analyses by risk level were significant for the total sample, $\chi^2(2, N = 99) = 9.37$, $p = .01$ $\phi = .31$.

DISCUSSION

The overall findings from the current study support the use of the SAVRY with juvenile offenders. The SAVRY total score was a good predictor of VR during both 1-year and 3-year follow-up periods with AUC's of .77 and .66, respectively. Rice and Harris (1995)

TABLE 3:   General Recidivism by Risk Level for 3-Year and 1-Year Follow-Up

General Recidivism Rate (%)	Risk Level		
	Low	Moderate	High
For 3-year follow-up			
Total sample21%	50%	76%	
Males	20%	59%	74%
Females	22%	36%	80%
Native Canadian	25%	38%	93%
Caucasian	19%	56%	63%
For 1-year follow-up			
Total sample	3%	35%	52%
Males	4%	41%	48%
Females	0%	27%	60%
Native Canadian	0%	19%	64%
Caucasian	4%	42%	42%

would classify these results as being large effect sizes because they indicate that anything .66 or greater is a large effect. Furthermore, these results are similar to McEachran (2001), who found an AUC of .70 for violent recidivism in a 3-year follow-up. This study produced stronger results for the longer follow-up period but, given that the confidence intervals overlapped, a true difference may not exist. Still, these results suggest that the SAVRY may be better at predicting violent behavior during a period of several years than during a shorter time frame. Many individuals who will violently recidivate may not do so within a year.

In terms of the predictive validity of the SAVRY risk levels, results for both the 1-year and 3-year follow-up periods demonstrated that the SAVRY risk levels significantly predicted VR. In the longer follow-up, only 1 out of the 34 (3%) adolescents rated as low-risk violently recidivated, 14 out of 54 (26%) adolescents rated moderate-risk violently recidivated, and 19 out of 34 (56%) adolescents rated as high-risk reoffended violently. These results indicate that one may be fairly certain—for example, 97% sure—that a youth rated low-risk will not violently recidivate. However, the picture is less clear for youth who receive ratings of moderate or high. For example, a high-risk rating identifies most of the youth who will reoffend violently but also identifies a significant number who will not. Results for the 1-year follow-up show a similar trend across risk levels, except that the rate of violence for high-risk youth is 30%, which is nearly half the rate for the longer follow-up period. This suggests that during a short time period of 1 year, the recidivism rates for moderate- and high-risk offenders are not much different: for example, 19% and 30%, respectively. Also, in contrast to the longer time period, high-risk youth during 1 year were actually more likely to nonviolently reoffend than to violently reoffend.

Next, the SAVRY demonstrated good predictive validity for both genders but only during a longer follow-up. Using the 1-year follow-up, results for low-risk youth were identical to those for the longer follow-up within every subgroup. The differences between follow-up periods were most apparent for those rated high-risk. It is important to note that the SAVRY risk rating was found to significantly predict VR for the total sample, and these percentages, as seen in Table 3, are similar to those for the various subgroups. It is likely,

TABLE 4:   Violent Recidivism by Risk Level for 3-Year and 1-Year Follow-Up

Violent Recidivism Rate (%)	Risk Level		
	Low	Moderate	High
For 3-year follow-up			
Total sample3%	26%	56%	
Males	4%	31%	57%
Females	0%	9%	60%
Native Canadian	3%	25%	86%
Caucasian	4%	26%	37%
For 1-year follow-up			
Total sample	3%	19%	30%
Males	4%	22%	30%
Females	0%	13%	30%
Native Canadian	0%	19%	36%
Caucasian	4%	18%	26%

then, that greater statistical power achieved by using a larger sample size would have found an effect for these subgroups. Still, visual analysis of Table 4 reveals that differences in recidivism rates between moderate- and high-risk categories were much more apparent for the longer follow-up period. This suggests that for gender and ethnic categories, clinicians can likely be more confident in stating that a youth will violently reoffend when a longer follow-up period is used.

Although the SAVRY was not designed to predict GR or NVR, these outcome variables were considered to explore how the tool performs in other areas. For GR, the SAVRY total score was a significant predictor for both 1-year and 3-year follow-up. Similarly, the SAVRY risk rating significantly predicted GR for both follow-up periods. It is useful to note that of those deemed low risk on the SAVRY, only 3% committed any reoffense during 1-year follow-up. This suggests that a low-risk rating is not only associated with a negligible rate for VR but also reveals a low probability for GR. In contrast to results for VR, the SAVRY risk rating significantly predicted GR for 1-year follow-up for both genders. In summary, although the SAVRY performed equally well for GR and VR during the 3-year follow-up period, there is some indication that the SAVRY may perform better for GR (AUC = .75) than for VR (AUC = .66) during a 1-year follow-up.

For the prediction of NVR, the SAVRY total score had good predictive validity for 3-year follow-up (AUC = .68) and very strong predictive validity for 1-year follow-up (AUC = .80). However, the SAVRY risk rating only predicted NVR for 1-year follow-up. Examination of Table 5 reveals that for the 3-year follow-up, the level of NVR does not depend on risk level. For example, the rate of NVR for low-risk youth was the same as that found for high-risk youth. One explanation for this result is that during the 3-year follow-up, some individuals deemed low-risk (18%) commit a nonviolent reoffense after 1 year, and many youth in the high-risk category (26%) cease to be nonviolent reoffenders because they commit a violent reoffense after 1 year. Such a phenomenon would tend to equalize the NVR rate across risk levels. Thus, the SAVRY is not clinically useful for predicting who will commit only a nonviolent reoffense during a 3-year follow-up period.

TABLE 5:   Nonviolent Recidivism by Risk Level for 3-Year and 1-Year Follow-Up

Nonviolent Recidivism Rate (%)	Risk Level		
	Low	Moderate	High
For 3-year follow-up			
Total sample	18%	24%	19%
Males	16%	28%	17%
Females	22%	27%	20%
Native Canadian	22%	13%	7%
Caucasian	15%	30%	26%
For 1-year follow-up			
Total sample	0%	16%	22%
Males	0%	19%	18%
Females	0%	14%	30%
Native Canadian	0%	0%	28%
Caucasian	0%	24%	16%

LIMITATIONS

Several limitations of this study should be noted. First, a relatively small sample of select juvenile offenders was used. These adolescents were referred for a multidisciplinary assessment likely because of concerns about the presence of psychological problems, tendency for violence, and/or co-occurring problem behaviors. As a result, they may represent a subgroup of more serious juvenile offenders within the population of youth who commit criminal offenses. Another limitation is that recidivism data consisted of criminal records that do not provide information on crimes that were unreported or did not result in a criminal charge or conviction. A more sensitive and accurate outcome measure would likely improve the performance of the SAVRY in a predictive validity analysis.

Another factor to consider is that this study did not consider the severity of the violent reoffense. Clearly, an offender who commits only minor assaults poses less of a risk to public safety than does an offender who commits more serious violent crimes such as rape and murder. In addition, repeat offenders often represent a more seriously disturbed subgroup of youth offenders. Future studies may choose to investigate the number and type of violent reoffenses to determine whether the SAVRY is effective in identifying youth who commit ongoing, serious violent reoffenses. Furthermore, given that the base rate of violent reoffending in this sample was 28%, it may be beneficial to increase overall sample size in future studies to increase the number of violent reoffenders that can be analyzed. Furthermore, this study was limited because the authors relied on archival data. Although the archival files contained sufficient information for the majority of items, there was little information available for the coding of a few items: namely, stress and poor coping, lack of social support, and community disorganization. The information sources, which consisted of prior court-mandated assessments, were not conducted with the goal of gathering information for the SAVRY items. A superior approach would be to employ a true prospective research design with interviews and assessment tools geared to obtain the information needed to complete the SAVRY.

CONCLUSIONS

Regardless of study limitations, the SAVRY was found to possess good predictive validity in the assessment of violence risk. Youth who obtained a low-risk rating did not commit violent offenses in either the short or long term. However, high-risk ratings on the SAVRY identified the majority of those who would commit a violent act. The results of this study are comparable to those found by past research studies on the SAVRY and provide evidence that the SAVRY maintains its predictive validity for follow-up periods beyond 1 year. In fact, the results of this study suggest that although the SAVRY predicts violent recidivism in a 1-year follow-up, even stronger results are obtained using an extended follow-up. Interestingly, the SAVRY was able to predict general recidivism within both 1-year and 3-year follow-up and also nonviolent recidivism within 1-year. This suggests that many of the items on the SAVRY tap into the larger construct of general recidivism.

The SAVRY total score was found to be robust in prediction of violent recidivism across gender and ethnicity, with the strongest findings found in the 3-year follow-up. In addition, the SAVRY risk level had good predictive validity during 3-year follow-up for gender and ethnic subgroups. Future research may choose to investigate how the SAVRY performs with specific age groupings, such as younger versus older adolescents. To improve predictive validity, future research should focus on the contribution of individual items to recidivism. Within the high-risk category defined by the SAVRY, there is still a large percentage of youth who do not violently recidivate. The specificity of this tool would be enhanced if research was able to identify certain items or a combination of weighted items that describe violent recidivists more accurately.

In summary, violence risk assessment in adolescents is an emergent research area with great potential for clinical application. Identifying juvenile offenders at risk for future violent offenses is the first step in developing effective management and intervention strategies for these offenders. The SAVRY assists in offender classification and enhances treatment planning by identifying dynamic risk factors to target for risk reduction. In addition, the SAVRY is user friendly as it contains items that are defined in terms of specific indicators. The vast majority of SAVRY items can be coded from existing file information in a reasonable period of time without requiring additional assessments. Overall, the SAVRY is a solid contribution to the field of adolescent risk assessment and is a most promising tool.

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