An Examination of the Structured Assessment of Protective Factors for Violence Risk – Youth Version (SAPROF-YV) in Canadian Adolescents

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Abstract

The Structured Assessment of Protective Factors for Violence Risk – Youth Version (SAPROF-YV; de Vries Robbé et al., 2015) is a new measure of protective factors that is used with a risk-focused tool, such as the Structured Assessment of Violence Risk in Youth (SAVRY; Borum et al., 2006), to provide a more balanced and comprehensive assessment of violence risk in adolescents. Currently, there are no published studies on the SAPROF-YV's predictive validity. The present study investigated the relationship between the SAPROF-YV and aggression in a sample of 69 adolescents. Using a retrospective follow-up study design, files were reviewed at an inpatient treatment center and a probation office. Results indicated that the SAPROF-YV demonstrated good convergent and discriminant validity with the SAVRY. The SAPROF-YV was predictive of the absence of minor verbal aggression. While the SAPROF-YV added incremental predictive validity to SAVRY Protective factors for minor verbal aggression, it did not add incrementally to SAVRY Risk factors in the prediction of any type of aggression. Implications for future research and clinical applications are discussed.

Keywords: protective factors, aggression, adolescence, risk assessment, violence

An Examination of the Structured Assessment of Protective Factors for Violence

Risk – Youth Version (SAPROF-YV) in Canadian Adolescents

Several adolescent risk assessment tools have been developed to aid in the prediction and management of risk for reoffending (Viljoen, Gray, & Barone, 2016). These tools are often comprised of risk factors (i.e., factors that increase the likelihood of violence or offending) such as peer delinquency and poor parental monitoring (Borum, Bartel, & Forth, 2006). However, several scholars have highlighted the overemphasis of risk factors in violence risk assessment, as well as the lack of attention placed on protective factors (e.g., Hart, 2008; Rogers, 2000).

Protective factors are described as factors that decrease the likelihood of future violence (de Vogel, de Ruiter, Bouman, & de Vries Robbé, 2012; de Vries Robbé, de Vogel, Wever, Douglas, & Nijman, 2016; Dubow, Huesmann, Boxer, & Smith, 2016). For instance, support from parents, positive peer relationships, and interest in schoolwork are considered protective factors for aggression and violence (de Vries Robbé, Geers, Stapel, Hilterman, & de Vogel, 2015). Some researchers have focused on whether protective factors represent the opposite end of risk factors, or if they represent unique non-overlapping factors. Other researchers have considered whether protective factors exert main effects (i.e., direct and independent impacts) on an undesired outcome or have moderated buffering effects (i.e., dependent interactions with risk factors) to reduce negative outcomes in adolescents considered high risk (Lösel & Farrington, 2012).

Despite the debate about the conceptualization of protective factors, researchers have highlighted the importance of the inclusion of protective factors in violence risk assessment to provide a more balanced and comprehensive assessment of risk (de Vries

Robbé, 2014; de Vries Robbé et al., 2015). For instance, including protective factors may

provide a more accurate prediction of violence risk, increase the focus on violence

prevention (de Vries Robbé & de Vogel, 2012), and promote a positive perspective for

both treatment providers and offenders (e.g., Seligman, 2002).

Existing Research on Measures of Protective Factors

Although the majority of risk assessment tools, particularly those for adult

offenders, fail to incorporate protective factors, a few tools for adolescents include

protective factors (e.g., Structured Assessment of Violence Risk in Youth, Borum et al.,

2006; Short-Term Assessment of Risk and Treatability: Adolescent Version, Viljoen et

al., 2014; Youth Level of Service/Case Management Inventory, Second Edition, Hoge &

Andrews, 2011). One of the most common of these tools is the Structured Assessment of

Violence Risk in Youth (SAVRY; Borum et al., 2006), which is a structured professional

judgment (SPJ) tool that assesses risk for violent behavior in adolescents. The SAVRY

comprises 24 risk items (rated as low, moderate, or high) within Historical,

Individual/Clinical, and Social/Contextual domains, as well as six Protective factors that

are rated as present or absent. Previous research has demonstrated that the SAVRY has

high interrater reliability (e.g., McEachran, 2001) and good predictive validity (Borum,

Lodewijks, Bartel, & Forth, 2010; Hilterman, Nicholls, & van Nieuwenhuizen, 2014;

Lodewijks, Doreleijers, de Ruiter, & Borum, 2008; Olver, Stockdale, & Wormith, 2009).

The predictive validity of the SAVRY Protective factors has yielded some

positive findings (e.g., Lodewijks et al., 2008; Lodewijks, de Ruiter, & Doreleijers,

2010), such as inversely predicting general reoffending (Shepherd, Luebbers, Ogloff,

Fullam, & Dolan, 2014), violence (Lodewijks et al., 2010), and both violent and general

reoffending (MacLachlan, Gray, Roesch, Douglas, & Viljoen, 2018; Viljoen, Bhanwer, Shaffer, & Douglas, 2018). Some studies have shown mixed findings, such as predictive validity for only general reoffending (Chu, Goh, & Chong, 2016) or nonviolent reoffending (Penney, Lee, & Moretti, 2010), or only violent reoffending (Hilterman et al., 2014; Zhou, Witt, Cao, Chen, & Wang, 2017). Further, a recent systematic review found that SAVRY Protective factors were not significantly related to violence or offending (k = 14 studies; Dickens & O'Shea, 2018). These inconsistent results suggest that the SAVRY Protective factors may have limited predictive validity in some contexts and populations. As such, it may be necessary to include a more comprehensive measure of protective factors when assessing risk for violent behavior in adolescents.

Beyond the need for further research on protective factors, there is a need for more sophisticated analyses (e.g., Lösel & Farrington, 2012), such as whether protective factors add incrementally to risk factors in the prediction of reoffending. A few studies on the SAVRY have investigated this, but findings are mixed. One study found incremental validity for SAVRY Protective factors for nonviolent reoffending only (Dolan & Rennie, 2008). Lodewijks and colleagues (2010) found that SAVRY Protective factors add incrementally above and beyond SAVRY dynamic factors (i.e., Individual/Clinical, Social/Contextual factors) in predicting violent reoffending. In contrast, other studies have found that SAVRY Protective scores do not add incrementally to SAVRY Risk total scores in the prediction of violent and nonviolent reoffending (Chu et al., 2016; Hilterman et al. 2014; Penney et al., 2010; Schmidt, Campbell, & Houlding, 2011; Viljoen et al., 2018). These findings may be due to the limited number of items on the SAVRY that assess protective factors. Further, the

dichotomous response format may facilitate a loss of information (i.e., no option for a rating somewhere between present and absent).

Structured Assessment of Protective Factors for Violence Risk – Youth Version

To address gaps in the literature and in the assessment of protective factors in violence risk assessment, de Vries Robbé and colleagues (2015) developed the Structured Assessment of Protective Factors for Violence Risk – Youth Version (SAPROF-YV). This measure is designed for concurrent use with an adolescent risk assessment measure, such as the SAVRY, to provide a comprehensive assessment of violence risk. The SAPROF-YV follows an SPJ model and comprises 16 protective factors with Resilience, Motivational, Relational, and External domains. The Resilience domain consists of individual internal factors that are related to resilience and social skills. The Motivational domain is focused on the adolescent's motivation for active participation in his or her treatment. Items on the Relational domain concern interpersonal relationships that are prosocial, warm, and supportive. Finally, the External domain focuses on support from external sources, such as the adolescent's environment or circumstances. Each factor is rated as hardly present, present to some extent, or clearly present. All SAPROF-YV factors are putatively dynamic, with the goal of bridging risk assessment with risk management by targeting malleable protective factors during treatment.

Thus far, research on the SAPROF-YV's reliability and validity is lacking (de Vries Robbé et al., 2015). Pilot studies ($n = 76$ and 37) examining adolescent files from a forensic psychiatric clinic revealed excellent internal consistency (ICC = .84, .91), as well as convergent validity with the SAVRY Protective factors (rs = .63, .89) and discriminant validity with SAVRY Risk factors (rs = -.59, -.60). To our knowledge, only one other

study has examined psychometric properties of the SAPROF-YV. A study examining

adolescent probation files in Singapore reported good to excellent internal consistency

(ICCs of .67 to .97; Dongdong, Chu, Xu, Zeng, & Ruby, 2018), but did not report on

other psychometric properties (e.g., convergent or discriminant validity) of the SAPROF-

YV. To our knowledge, there are no other published studies have investigated the

relationship between SAPROF-YV factors and outcomes of offending or aggression.

The Present Study

The present study was one of the first independent studies to assess the predictive

validity of the SAPROF-YV. This study used a retrospective follow-up study design to

examine the relationship between SAPROF-YV protective factors and aggression in

adolescents from an inpatient treatment center and from a probation office. First, we

examined the SAPROF-YV's convergent and discriminant validity with the SAVRY

Protective and Risk factors, respectively. Second, we examined the SAPROF-YV's

predictive validity for the *absence* of aggression. Finally, we examined the incremental

predictive validity of the SAPROF-YV above SAVRY Risk factors and above SAVRY

Protective factors.

Methods

Sample

Data was collected at two sites in the Greater Vancouver Area: an adolescent

inpatient treatment center and a probation office. We chose these settings because risk

assessments are routinely conducted in both of these types of settings. The treatment

center provides inpatient services for adolescents aged 12 to 18 years with significant

psychiatric, emotional, and/or behavioral issues. Files from 2011 to 2015 were included

from the treatment center's externalizing disorders program and internalizing disorders program. The internalizing program admits many adolescents each year; thus, files were randomly selected from this program for inclusion in the study. The externalizing program has fewer adolescents admitted in their program, thus consecutive admissions were used to maximize the number of usable files. In addition, a random sample of adolescent probation files from 2012 to 2014 was selected as part of a larger, ongoing study.

Sample characteristics. The total sample consisted of 69 male and female adolescents aged 13 to 18 years ($M = 15.72$, S$D = 1.46$). Approximately half of the sample were male (59.42%; $n = 41$). With respect to ethnicity, 55.07% ($n = 38$) of the sample were Caucasian, 24.64% ($n = 17$) were Aboriginal, 8.70% ($n = 6$) were Asian, 5.80% ($n = 4$) were Hispanic, and 5.80% ($n = 4$) were East Indian/Middle Eastern. Of the total sample, 56.52% ($n = 39$) were from the treatment sample[1], and 43.48% ($n = 30$) were from the probation sample. Adolescents from the two sample sites did not differ significantly with respect to gender, $\chi^2 (1) = 2.46$, $p = .12$, or age, $t (67) = .16$, $p = .18$.

The follow up period for the treatment sample was dependent on the adolescent's duration of stay at the treatment center, which ranged from 1.45 to 27.56 months ($M = 5.05$, $SD = 3.79$). The mean length of follow-up was 2.63 months ($SD = 1.14$ months), as some adolescents were discharged before six months. A fixed follow up period of six months was used for the probation sample. As such, the two groups had significantly different lengths of follow up, $t (67) = -16.09$, $p < .01$. Approximately half of the total sample had prior charges (49.28%; $n = 34$); adolescents in the probation sample were

significantly more likely than those in the treatment sample to have prior offenses, χ^2 (1)

= 41.22, $p < .01$.

Measures

      The Structured Assessment of Protective Factors for Violence Risk – Youth Version (SAPROF-YV; de Vries Robbé et al., 2015). As described earlier, the SAPROF-YV is a 16-item SPJ measure of protective factors in adolescents with four subscales: Resilience, Motivational, Relational, and External. Each item is rated on the following scale: 0 (*hardly present*), 1 (*present to some extent*), or 2 (*clearly present*), and raters may include positive and negative signs to indicate that a rating is slightly higher or lower, respectively. Items are rated based upon information during the past six months to predict violent behavior for the subsequent six months.

      After coding the SAPROF-YV and the risk tool concurrently, the rater assigns a summary protection rating from the SAPROF-YV and a summary risk rating that considers both the SAPROF-YV and the risk tool. Both of these ratings use the following ratings: low, low-moderate, moderate, moderate-high, and high. Total scores can be created by summing the scores on all of the items or by domain.

      As this is a new measure, there is a dearth of literature on the reliability and validity of the SAPROF-YV. Preliminary research revealed excellent internal consistency (ICCs of .67 to .97; Dongdong et al., 2018). Additionally, preliminary studies with the SAPROF-YV pilot version reported convergent validity with the SAVRY Protective factors (r = .63, .89) and discriminant validity with SAVRY Risk factors (r = -.59, -.60; de Vries Robbé et al., 2015).

Structured Assessment of Violence Risk in Youth (SAVRY; Borum et al.,

2006). The SAVRY is a risk assessment tool for adolescents aged 12 to 18 years that is

composed of Historical, Social/Contextual, and Individual/Clinical factors. It comprises

24 risk items that are rated as 0 (*low*), 1 (*moderate*), or 2 (*high*). The total risk score is

calculated by summing the risk factors, and high scores are indicative of increased risk

factors. Total scores are not recommended for use in clinical assessments, however they

are typically used within research contexts. The rater assigns a summary risk rating for

violence risk level (i.e., low, moderate, or high). The SAVRY also includes six

protective factors that are rated as present or absent. The SAVRY Protective factors are

scored by summing the six items.

The SAVRY has demonstrated sound reliability and validity. For instance, the

total risk score has attained excellent interrater reliability (ICC = .86; Vincent, Guy,

Fusco, & Gershenson, 2012). In addition, meta-analytic reviews have found large effect

sizes for the SAVRY in the prediction of violence (Singh, Grann, & Fazel, 2011).

Outcome. Aggression outcome variables were coded using the Short Term

Assessment of Risk and Treatability Outcome Scale (SOS; Nicholls et al., 2007), which

is derived from the Overt Aggression Scale (OAS; Yudofsky, Silver, Jackson, Endicott,

& Williams, 1986). Outcome coding included the frequency of verbal aggression (e.g.,

threats) and physical aggression against others (e.g., pushing, kicking). The SOS

includes four levels of severity for each type of aggression. For instance, under physical

aggression, a level-one severity includes: "makes threatening gestures, swings at people,

grabs at clothing, throws objects dangerously" (Nicholls et al., 2007). A level-four

severity of physical aggression is described as "attacks others, uses weapons, resulting in

severe physical injury (e.g., fracture, loss of teeth or consciousness, lacerations, internal injury)." The SOS has shown adequate interrater reliability for inpatient populations (ICC = .70; Braithwaite, Yanick, Crocker, & Reyes, 2010).

For the purpose of this study, severity levels of 1 and 2 were collapsed to form a "minor" aggression category, and severity levels of 3 and 4 were collapsed to form a "major" aggression category for each of type of aggression. Some studies have collapsed all severity levels to look at the presence of any aggression (e.g., Desmarias, Nicholls, Wilson, & Brink, 2012); however, Rogers (2000) cautions against collapsing violent behavior across severity, and Lösel and Farrington (2012) suggest that protective factors may have different effects across severity level. The present study included a severity of 2 within the minor category to allow for a more stringent classification of "severe" or major aggression.

Procedure

Ethics approval was obtained through the university and research sites. The first author completed the SAVRY and SAPROF-YV coding. This rater attended a day-long SAVRY training workshop. The rater obtained SAPROF-YV training through carefully reading the manual and completing two independent practice cases for each measure, which were compared to gold standard ratings to ensure that adequate interrater reliability (i.e., within five points on the total scores) was achieved before data collection commenced. In addition, the first author had previous experience in delivering a day-long training on the SAPROF-YV that was developed by the SAPROF-YV authors.

Treatment sample. At the treatment center, files were selected if they met the following inclusion criteria: (a) were from an inpatient program, (b) the length of stay

was 60 days or greater, (c) had a social and family history report, and (d) contained a

psychological report. The SAPROF-YV and SAVRY were coded using file information

that was collected within the first few weeks after admission, including psychological

assessment reports and social and family history reports. The rater was kept blind to the

outcomes by reviewing file information near admission/intake only (i.e., progress notes

or file information subsequent to the psychological report date were not reviewed). In

addition, during outcome coding the file numbers were randomly reassigned new

identification numbers. The SOS was coded based on information following the date of

the psychological report interview date for a period up to six months, as the SAPROF-YV

is intended to predict violence in the subsequent six months. The SOS was coded using

progress notes recorded by treatment staff (e.g., nurses and clinicians).

Probation sample. A sample of probation files was randomly selected as part of

a larger study's data collection. Files were included if they had a presentence report

completed within the first six months of the probation order. The SAPROF-YV and

SAVRY were coded using presentence reports and contact logs recorded by the

adolescent's probation officer for the first six months post-intake. The rater was blind to

the outcomes by reviewing file information during this six month period only; one trained

research assistant coded the SOS by independently reviewing official records (to code

prior offenses) and contact logs during a fixed follow-up period of six months post-

intake.

Analyses

Convergent and discriminant validity. Convergent and discriminant validity

analyses were conducted with the total sample, as the two samples did not show

significantly different mean total scores on the SAPROF-YV and SAVRY. SAPROF-YV and SAVRY total scores were normally distributed based on visual examination of the quantile-quantile plots and histograms. Pearson bivariate correlations were conducted; positive associations between the SAPROF-YV and SAVRY Protective factors (e.g., $r \geq .50$; Cohen, 1988) would suggest convergent validity, whereas negative associations between the SAPROF-YV and SAVRY Risk factors would indicate discriminant validity.

Predictive validity. Predictive validity analyses were conducted by sample due to the significant difference in follow-up length. The area under the curve (AUC) value from Receiver Operating Characteristic analyses (Hanley & McNiel, 1982) was used to determine the accuracy of the SAPROF-YV in discriminating between adolescents who engaged in aggressive behavior and those who did not. AUC values of .556, .639, and .714 are indicative of small, moderate, and large effect sizes, respectively (Rice & Harris, 2005).

Incremental validity. Hierarchical logistic regression analyses were conducted to examine the incremental predictive validity of SAPROF-YV total scores above SAVRY Risk total scores, as well as above SAVRY Protective scores (Hunsley & Meyers, 2003). For these analyses, block 1 included the SAVRY Risk or Protective total score, and block 2 included the SAPROF-YV total score. Sample site was entered as a covariate, thus these analyses used the total sample.

Results

Descriptive Statistics

Means and standard deviations for SAPROF-YV and SAVRY scores are presented in Table 1. For the total sample, SAPROF-YV total scores ranged from 3 to 27 (M = 13.51, SD = 5.83). SAVRY Protective scores ranged from 0 to 6 (M = 1.80, SD = 1.63). Adolescents from the two samples did not have significantly different SAPROF-YV total scores, t (67) = .09, p = .93, SAVRY Risk total scores, t (67) = -.53, p = .60, or SAVRY Protective scores, t (67) = -1.06, p = .30.

The two samples differed significantly for the majority of the aggression variables, excluding major physical aggression (see Table 2). In the treatment sample, verbal aggression was most frequent. Overall, incidents of aggression were less frequent in the probation sample than in the treatment sample. In the probation sample, base rates of major verbal aggression and minor physical aggression were less than 10%; these variables were excluded for subsequent analyses for the probation sample.

Convergent and Discriminant Validity Between the SAPROF-YV and the SAVRY

As the patterns of correlations were similar across samples, the results are presented for the total sample. A large positive correlation was found between the SAPROF-YV total score and SAVRY Protective score (r = .85, p < .01). A large negative correlation was found between the SAPROF-YV total score and SAVRY Risk total score (r = -.76, p < .01).

Predictive Validity

AUC values with 95% confidence intervals are presented in Tables 3 and 4.

Treatment sample. For the treatment sample SAPROF-YV total scores, SAPROF-YV summary ratings, and SAVRY Protective scores significantly predicted minor verbal aggression with large effect sizes (AUC > .71, Rice & Harris, 2005).

Although these measures also predicted physical aggression with moderate AUC scores, these values did not reach significance. SAVRY Risk total scores and summary ratings significantly predicted verbal aggression and major physical aggression with large AUC scores.

Probation sample. No AUC values in the probation sample reached significance. SAPROF-YV total scores and protection summary ratings had moderate AUC scores for predicting minor verbal aggression and major physical aggression, and SAVRY Protective scores had chance-level AUC scores (.46 to .56). In contrast, SAVRY Risk total scores showed a large AUC score for minor verbal aggression, and a moderate AUC score for major physical aggression.

Incremental Predictive Validity Above SAVRY Risk or Protective Factors

SAPROF-YV total scores were not a significant predictor of any type of aggression, above and beyond SAVRY Risk total scores (see Table 5). The SAPROF-YV total score significantly predicted minor verbal aggression above and beyond the SAVRY Protective score and sample site; however, the SAPROF-YV did not add unique variance to the prediction of any other aggression outcome variable. The SAVRY Protective score was not a significant predictor of any type of aggression in these models (see Table 6).

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Discussion

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As the SAPROF-YV is a relatively new measure, it is imperative for research to first evaluate its psychometric properties (de Vries Robbé et al., 2015). This research is one of the first studies to examine the validity of the SAPROF-YV and the first to examine the SAPROV-YV's psychometric properties in a Western Canadian sample.

Moreover, the present study examined the SAPROF-YV in both an adolescent inpatient treatment sample and a probation sample.

Overall, the results provide support for the convergent and discriminant validity of the SAPROF-YV. The SAPROF-YV demonstrated a large positive correlation with SAVRY Protective factors (i.e., $r > .50$; Cohen, 1988), and a large inverse correlation with SAVRY Risk factors, and these findings are consistent with the pilot studies (de Vries Robbé et al., 2015). While pilot research focused on adolescent forensic samples (de Vries Robbé et al., 2015), the present results examined both a psychiatric and an offender sample, suggesting that convergent and discriminant validity with the SAVRY may be generalizable to forensic and psychiatric samples of adolescents.

The SAPROF-YV total score and protection summary risk rating were significant predictors of (the absence of) minor verbal aggression in the treatment sample. In particular, both the SAPROF-YV total score and protection summary rating had large effect sizes for the prediction of the absence of minor verbal aggression, which was the most common and frequent form of aggression. Although past research has focused on physical aggression, or has collapsed verbal and physical aggression (Nagin & Tremblay, 1999), verbal aggression may be important to examine because it is common in inpatient settings. Few adolescent risk assessment studies have been conducted with psychiatric samples, but this study found that base rates of some forms aggression were fairly high (e.g., greater than SOS rates in adult inpatient samples; Desmarais et al., 2012), suggesting that it may be important to regularly assess risk in this population. Further, instances of verbal aggressions (e.g., threats to others) might trigger or escalate to physical violence.

Although many researchers and practitioners consider the assessment of protective factors to be important, there is some uncertainty about whether protective factors add to predictions above and beyond risk factors. In the current study, SAPROF-YV total scores were not predictive of aggression above and beyond SAVRY Risk factors. Previous research has shown inconsistent findings regarding the incremental validity of protective factors over risk factors (Dolan & Rennie, 2008; Penney et al., 2010; Schmidt et al., 2011). These findings suggest that the variance captured by protective factors may be explained by risk factors. In addition, the AUC scores for predictive validity were generally higher for the SAVRY Risk total score and summary risk rating, compared to the SAPROF-YV total score and summary ratings. Thus, risk factors may appear more useful for risk prediction, but it is still unknown whether protective factors have added utility for violence prevention and risk management.

One of the primary rationales for the development of the SAPROF-YV is that existing measures of protective factors, such as the SAVRY Protective factors, are brief. Furthermore, it has been found that brief measures of protective factors (i.e., SAVRY Protective factors) tend to capture mainly deficits in protective factors (i.e., low scores), as opposed to the presence of protective factors (Viljoen et al., 2018). In the current study, the SAPROF-YV showed incremental predictive validity over SAVRY Protective factors for minor verbal aggression, suggesting that it contributes more information than is captured by the SAVRY Protective factors alone. However, the SAPROF-YV did not outperform the SAVRY Protective factors in the prediction of physical aggression, despite being a lengthier tool (i.e., 16 ordinal items on SAPROF-YV versus six dichotomous items on the SAVRY Protective factors).

Implications and Future Directions

As the SAPROF-YV is a relatively new tool, there is limited research on its

psychometric properties. There are two main implications from the current psychometric

findings. First, research should continue to examine the predictive validity of this tool

with adolescents. Future research should also examine the specific effects of individual

protective factors. The SAPROF-YV manual acknowledges that some factors have

limited empirical support, such as Social Competence and Court Order (de Vries Robbé

et al., 2015), and these factors require further validation to support their inclusion in the

tool. Additionally, different factors may have greater predictive validity in different

samples of adolescents (e.g., by gender, by forensic versus mental health settings). For

instance, Prosocial Involvement on the SAVRY has been associated with future violence

in girls but not in boys (Sijtsema, Kretschmer, & van Os, 2015). Prior Confirmatory

Factor Analysis with the SAVRY has also found that SAVRY risk and protective factors

cluster differently across gender, indicating that certain factors might be more or less

relevant for girls versus boys (Hilterman, Bongers, Nicholls, & van Nieuwenhuizen,

2016). In the current study, gender differences were not examined due to the small

sample size.

Second, research should examine how the implementation of the SAPROF-YV in

real-world settings impacts treatment and management decisions. Research suggests that

implementation of the SAVRY lead to an increased consideration of protective factors

with respect to determining supervision levels for adolescent offenders, as well as a

greater match between needs, protective factors, and service recommendations from

youth justice professionals (Vincent, Paiva-Salisbury, Cook, Guy, & Perrault, 2012). To

date, no research has examined a comprehensive assessment of protective factors in field

settings. In clinical settings, protective factors may be valuable targets within

interventions (Singh et al., 2014), such as by leveraging or improving protective factors

that are present or lacking, respectively. However, there is a dearth of literature

examining strength-based intervention planning, and thus it requires further examination

(Singh et al., 2014).

Limitations

The main limitation of the proposed study concerns the small sample size and low

power. Although the total sample size is comparable to some studies (e.g., Klein,

Rettenberger, Yoon, Köhler, & Briken, 2015; Lodewijks et al., 2008) and expands upon

pilot research on the SAPROF-YV (e.g., $n = 37$; de Vries Robbé et al., 2015), it was

nevertheless smaller than ideal. Future research should include larger samples of

adolescents, which could also allow for comparisons across groups (i.e., by gender,

offender versus psychiatric).

In addition, the use of inpatient and community samples resulted in differences in

the quality of information used for outcome coding. Adolescents in the treatment sample

were under extensive supervision by treatment staff, whereas the adolescents in the

probation sample were living in the community and had relatively infrequent

observations from their probation officers (e.g., weekly or biweekly), which limited

opportunities to observe aggressive behavior. It is also likely that official records did not

detect instances of minor aggression that may have been observed by staff in an inpatient

setting. Therefore, the low base rates within the probation sample may be attributed to

the quality of the data sources, rather than true differences in rates of these behaviors across samples.

Another limitation concerns the retrospective study design. However, file information was comprehensive, and cases were excluded if the information was insufficient for coding. Moreover, this retrospective design was consistent with the majority of studies on risk assessment (Campbell, French, & Gendreau, 2009; Yang, Wong, & Coid, 2010).

Conclusion

In sum, these results provide preliminary support for the psychometric properties of the SAPROF-YV. Both the SAPROF-YV and SAVRY were predictive of verbal aggression. The SAPROF-YV demonstrated incremental predictive validity for the absence of minor verbal aggression over SAVRY Protective factors. However, the SAPROF-YV did not demonstrate incremental predictive validity for other aggression variables, or over the SAVRY Risk factors. These results suggest that further validation studies are needed with large, adolescent offender samples. More generally, advancing research on protective factors and assessment of strengths may be beneficial in promoting desistance from adolescent offending.

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Table 1.

Descriptive Statistics for SAPROF-YV and SAVRY scores.

	Total Sample (*n* = 69)	Treatment Sample (*n* = 39)	Probation Sample (*n* = 30)		
	M (SD)	*M (SD)*	*M (SD)*	*t*(**df**)	*p*
SAPROF-YV					
Total	13.51 (5.83)	13.56 (5.23)	13.43 (6.62)	$t(67) = .09$	.93
Resilience	2.43 (2.21)	2.54 (1.93)	2.30 (2.56)	$t(67) = .44$	.66
Motivational	5.05 (3.14)	5.45 (3.15)	3.78 (2.94)	$t(67) = 1.41$	.17
Relational	1.88 (1.32)	1.87 (1.28)	1.90 (1.40)	$t(67) = -.09$	.93
External	4.32 (1.05)	3.97 (.87)	4.77 (1.10)	$t(67) = -3.33$	< .01
SAVRY					
Risk total	17.00 (8.45)	16.54 (8.43)	17.67 (8.60)	$t(67) = -.53$	.60
Protective	1.80 (1.63)	1.62 (1.35)	2.03 (1.94)	$t(67) = -1.06$	.30
Historical	6.18 (4.09)	5.97 (4.23)	6.46 (3.95)	$t(67) = -.48$	.63
Social/Contextual	4.04 (1.88)	4.08 (1.75)	4.00 (2.07)	$t(67) = .17$	.87
Individual/Clinical	6.78 (4.36)	6.49 (4.58)	7.27 (4.11)	$t(67) = -.64$	.53

Table 2.

Base Rates of Aggression.

| Aggression | Base Rate of Aggression % (n) | | | χ^2(df) | p |
	Total Sample ($n = 69$)	Treatment Sample ($n = 39$)	Probation Sample ($n = 30$)		
Verbal					
Minor	49.27 (34)	71.79 (28)	20.00 (6)	$\chi^2(1) = 18.20$	< .01
Major	20.29 (14)	33.33 (13)	3.33 (1)	$\chi^2(1) = 9.44$	< .01
Physical					
Minor	17.39 (12)	28.21 (11)	3.33 (1)	$\chi^2(1) = 7.30$	.01
Major	20.29 (14)	28.21 (11)	10.00 (3)	$\chi^2(1) = 3.48$	.06

Table 3.

ROC Analyses for Verbal Aggression.

| | Treatment Sample | | | | Probation Sample | | | |
| | Minor | | Major | | Minor | | Major | |
	AUC (SE)	95% CI	AUC (SE)	95% CI	AUC (SE)	95% CI	AUC (SE)	95% CI
SAVRY								
Risk Total	.91*** (.05)	.81 - 1.00	.85*** (.06)	.73 - .97	.73 (.12)	.48 - .97	--	--
Risk Summary	.84** (.06)	.72 - .96	.82** (.08)	.67 - .97	.76 (.10)	.56 - .95	--	--
Protective Total	.73* (.09)	.55 - .91	.66 (.09)	.49 - .83	.46 (.10)	.26 - .66	--	--
SAPROF-YV								
Total	.82** (.08)	.68 - .97	.69 (.08)	.53 - .86	.65 (.10)	.45 - .86	--	--
Protection Summary	.82** (.08)	.65 - .98	.68 (.08)	.52 - .85	.67 (.10)	.48 - .87	--	--
Risk Summary	.80** (.07)	.67 - .94	.68 (.10)	.49 - .87	.71 (.11)	.51 - .92	--	--

Note. *p* < .05, **p* < .01, ***p* < .001. = area under the curve; SE = standard error; 95% CI = 95% confidence interval. AUC values for major verbal aggression are not presented for the probation sample due to a low base rate (i.e., < two individuals, or less than 10%).

Table 4.

ROC Analyses for Physical Aggression.

	Treatment Sample				Probation Sample			
	Minor		Major		Minor		Major	
	AUC (SE)	95% CI	AUC (SE)	95% CI	AUC (SE)	95% CI	AUC (SE)	95% CI
SAVRY								
Risk Total	.66 (.10)	.47 - .85	.77** (.08)	.63 - .92	--	--	.70 (.16)	.39 - 1.00
Risk Summary	.66 (.11)	.46 - .87	.76* (.09)	.58 - .93	--	--	.51 (.18)	.17 - .86
Protective Total	.66 (.09)	.48 - .85	.64 (.09)	.47 - .82	--	--	.56 (.20)	.17 - .94
SAPROF-YV								
Total	.64 (.09)	.47 - .82	.68 (.08)	.51 - .84	--	--	.60 (.18)	.24 - .96
Protection Summary	.63 (.09)	.45 - .80	.68 (.09)	.52 - .85	--	--	.65 (.19)	.28 - 1.00
Risk Summary	.65 (.10)	.46 - .85	.64 (.10)	.45 - .84	--	--	.55 (.20)	.14 - .96

Note. *$p < .05$, **$p < .01$, ***$p < .001$. AUC = area under the curve; SE = standard error; 95% CI = 95% confidence interval. AUC values for minor physical aggression are not presented for the probation sample due to a low bases rate (i.e., less than two individuals, or less than 10%)

Table 5.

Hierarchical Logistic Regression Analyses for the Incremental Validity of the SAPROF-YV Total Score Above SAVRY Risk Total Scores.

	B	SE	Wald	*df*	*p*	OR	95% CI
Verbal Minor							
SAVRY Risk	.21	.06	12.09	1	<.01	1.24	1.10 - 1.39
Sample	4.03	1.04	15.08	1	<.01	56.22	7.36 - 429.55
Model	$X^2 = 39.21$, $p < .01$. Cox & Snell $R^2 = .45$, Nagelkerke $R^2 = .60$						
SAPROF-YV	-.05	.10	.23	1	.63	.95	.79 - 1.16
Model	$X^2 = 39.44$, $p < .01$. Cox & Snell $R^2 = .45$, Nagelkerke $R^2 = .60$						
Verbal Major							
SAVRY Risk	.20	.06	10.30	1	<.01	1.22	1.08 - 1.37
Sample	3.54	1.25	8.08	1	<.01	34.61	3.01- 398.45
Model	$X^2 = 26.58$, $p < .01$. Cox & Snell $R^2 = .33$, Nagelkerke $R^2 = .52$						
SAPROF-YV	.06	.12	.21	1	.65	1.06	.83 - 1.34
Model	$X^2 = 26.79$, $p < .01$. Cox & Snell $R^2 = .33$, Nagelkerke $R^2 = .52$						
Physical Minor							
SAVRY Risk	.07	.04	2.88	1	.09	1.08	.99 - 1.17
Sample	2.50	1.10	5.14	1	.02	12.15	1.40 -105.11
Model	$X^2 = 10.71$, $p = .01$. Cox & Snell $R^2 = .15$ Nagelkerke $R^2 = .24$						
SAPROF-YV	-.06	.10	.33	1	.57	.95	.78 - 1.15
Model	$X^2 = 11.04$, $p = .01$. Cox & Snell $R^2 = .15$, Nagelkerke $R^2 = .25$						
Physical Major							
SAVRY Risk	.10	.04	6.09	1	.01	1.11	1.02 - 1.21
Sample	1.40	.76	3.41	1	.07	4.04	.92 - 17.81
Model	$X^2 = 10.04$, $p = .01$. Cox & Snell $R^2 = .14$, Nagelkerke $R^2 = .22$						
SAPROF-YV	-.02	.10	.03	1	.87	.99	.82 - 1.19
Model	$X^2 = 10.07$, $p = .02$. Cox & Snell $R^2 = .14$, Nagelkerke $R^2 = .22$						

Note. B = unstandardized regression coefficient; SE = standard error; OR = odds ratio; 95% CI = 95% confidence interval.

Table 6.

Hierarchical Logistic Regression Analyses for the Incremental Validity of the SAPROF YV Total Score Above SAVRY Protective Total Scores.

	B	SE	Wald	*df*	*p*	OR	95% CI
Verbal Minor							
SAVRY Protective	-.38	.21	3.27	1	.07	.69	.46 - 1.03
Sample	2.36	.61	15.16	1	< .001	10.56	3.22 - 34.60
Model	X^2 = 22.93, *p* < .001. Cox & Snell R^2 = .28, Nagelkerke R^2 = .38						
SAPROF-YV	-.39	.13	8.96	1	< .01	.67	.52 - .87
Model	X^2 = 35.07, *p* < .001. Cox & Snell R^2 =.40, Nagelkerke R^2 = .53						
Verbal Major							
SAVRY Protective	-.52	.29	3.17	1	.08	.60	.34 - 1.05
Sample	2.72	1.09	6.21	1	.01	5.14	1.79 - 128.20
Model	X^2 = 15.02, *p* < .01. Cox & Snell R^2 = .20, Nagelkerke R^2 = .31						
SAPROF-YV	-.16	.11	2.06	1	.15	.85	.69 - 1.06
Model	X^2 = 17.17, *p* < .01. Cox & Snell R^2 = .22, Nagelkerke R^2 = .35						
Physical Minor							
SAVRY Protective	-.47	.30	2.48	1	.12	.63	.35 - 1.12
Sample	2.44	1.09	5.01	1	.03	11.49	1.35 - 97.48
Model	X^2 = 11.55, *p* < .01. Cox & Snell R^2 = .15, Nagelkerke R^2 = .26						
SAPROF-YV	-.05	.11	.22	1	.64	.95	.76 - 1.18
Model	X^2 = 11.77, *p* = .01. Cox & Snell R^2 = .16, Nagelkerke R^2 = .26						
Physical Major							
SAVRY Protective	-.28	.24	1.40	1	.24	.76	.48 – 1.20
Sample	1.22	.71	2.92	1	.09	3.38	.84 - 13.64
Model	X^2 = 5.27, *p* = .07. Cox & Snell R^2 = .07, Nagelkerke R^2 = .12						
SAPROF-YV	-.17	.11	2.48	1	.12	.85	.69 - 1.04
Model	X^2 = 7.83, *p* = .05. Cox & Snell R^2 = .11, Nagelkerke R^2 = .17						

Note. B = unstandardized regression coefficient; SE = standard error; OR = odds ratio; 95% CI = 95% confidence interval.

Endnotes

[1] At the treatment center, 26.09% ($n = 18$) of adolescents were from the externalizing disorders program, and 30.43% ($n = 21$) were from the internalizing disorders program. Adolescents from the two programs did not differ significantly with respect to gender, χ^2 (1) = 5.75, $p = .06$, age, t (37) = .37, $p = .72$, length of treatment, t (37) = -1.01, $p = .32$, or length of follow up, t (37) = -.03, $p = .98$. Therefore, adolescents from the treatment center were considered as part of one sample (i.e., treatment sample).