AN EXAMINATION OF RISK, NEED, AND PROTECTIVE FACTORS AMONG
SASKATCHEWAN YOUNG OFFENDERS: IMPLICATIONS FOR RISK MANAGEMENT
AND COMMUNITY REINTEGRATION

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ABSTRACT

The present study examines the validity, reliability, and psychometric properties of three established forensic measures for youth, the Psychopathy Checklist: Youth Version (PCL: YV; Forth, Kosson, & Hare, 2003), the Structured Assessment of Violence Risk in Youth (SAVRY; Borum, Bartel, & Forth, 2002), and the Level of Service Inventory: Saskatchewan version (LSI-SK; Luong & Wormith, 2011). This study also examines the validity, reliability, and psychometric properties of two newer tools, the Violence Risk Scale – Youth Version (VRS-YV; Lewis, Stockdale, Gordon, & Wong, 2014) and the Structured Assessment of Protective Factors for Violence Risk: Youth Version (SAPROF-YV; de Vries Robbé, Geers, Stapel, Hilterman, & de Vogel, 2015). The VRS-YV is a violence risk assessment tool designed to bridge the gap between assessment and treatment by incorporating a modified version of Prochaska, DiClemente, and Norcross' (1992) transtheoretical model of change into the tool, allowing for assessment of treatment-based change. The SAPROF-YV was designed to provide an empirical measure of protective factors in youth, as the role of protective factors in risk assessment has garnered increasing attention in recent years (de Vries Robbé & Willis, 2017). Finally, the present study examined the predictive validity of the above tools with diverse populations; specifically, Indigenous youth and females.

The total sample consisted of 451 youth who had received assessment and/or treatment services from a community mental health facility in Saskatoon, Saskatchewan, however, not all files had enough information to score the tools. The PCL: YV, SAVRY, VRS-YV, and SAPROF-YV were each rated from file information on 257 young offenders (197 males, 60 females; 174 Indigenous, 57 non-Indigenous) who had enough information in file to rate the tools. The LSI-SK is rated by youth workers on all young offenders in Saskatchewan, so this information was gathered directly from files when available.

The forensic measures and their component/factors demonstrated good internal consistency ($\alpha = 0.84 – 0.99$) and inter-rater reliability ($ICC = 0.73 – 0.97$). There was also good convergent validity amongst the five tools, with correlations in the medium to large range but, there was generally no incremental validity amongst various tool pairings.

Male and female scores were generally similar across all five measures and component/factor scores. However, Indigenous youth tended to score significantly higher than

non-Indigenous youth, except on measures of protective factors where non-Indigenous youth scored higher than Indigenous youth.

Recidivism information was available for almost the entire sample ($n = 444$) over a mean follow-up time of approximately nine years. Predictive accuracy evidence was obtained for all five tools with respect to youth and adult violent, non-violent, and any recidivism. Area under the curve (AUC) values varied based on the tool and the type of recidivism, but generally fell in the small (AUC = 0.57 – 0.63) to moderate (AUC = 0.64 – 0.70) range for the total sample, with predictive accuracy for adult recidivism typically better than for youth recidivism. Survival analyses further supported the ability of the VRS-YV, SAVRY, and PCL: YV to differentiate between low, medium, and high-risk offenders (depending on recidivism type). Predictive accuracy for diverse sub-groups varied; they tended to be similar in magnitude for males and females, although values were often not significant for females. However, predictive accuracy was better for violent recidivism for Indigenous youth and non-violent recidivism for non-Indigenous youth.

Sufficient treatment information was available for a small portion of youth ($n = 89$), which was used to rate the VRS-YV post-treatment. There was a small but significant degree of change and change results tended to be in the expected direction, but was only significantly associated with decreased rates of non-violent recidivism.

The present study provides further evidence for the use of established forensic measures to assess risk in youth. It also provides further evidence that the newer VRS-YV is a valid tool to assess risk and predict recidivism, performing comparably to the other tools included in this study, with the added unique ability to assess treatment-based change. This study also speaks to the role that an empirical measure of protective factors, the SAPROF-YV, may play in the assessment of young offender risk. Finally, this study demonstrated that these tools can have predictive validity for future recidivism among diverse groups such as Indigenous youth and female youth. Limitations and future directions are discussed.

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DEDICATION

For everyone that was a part of this journey, from Notre Dame, to Acadia, and finally to the U of S. What started as a dream in a Grade 12 psychology class has now become my reality. This dissertation is a result of all the people that have taught me to work hard and be relentless in the pursuit of what makes my heart happy. For my parents and my brother, whose unwavering support encouraged me to pursue my goals. For my friends, teammates, and fellow students, who have supplemented this journey with other joys and memories. For my many teachers, professors, coaches, and supervisors, that helped mold my character and never let me settle for anything but my best. For the shoddy Charteris wifi, that I thankfully never have to rely on again. For my partner (and Fred), and his enduring love late in the journey that carried me home. Finally, for all those that couldn't be here to see this day – especially Grandma Shirley – I did it. *Luctor et Emergo.*

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1. INTRODUCTION

1.1 General Introduction

Quantifying youth crime rates imposes difficulties as there is no single source of information to determine the number of youth who commit crimes (Statistics Canada, 2016). According to the International Youth Survey, 37% of youth have reported engaging in one or more delinquent behaviors in their lifetime (Statistics Canada, 2016). While data suggest that there has been a consistent decline in the rate of youth crime in Canada since 2006, this drop is largely attributed to a 51% decrease in the rate of youth accused of property crime (e.g., theft; Statistics Canada, 2014). Despite representing only seven percent of the population, adolescents represent 13 percent of people accused of crime (excluding traffic and drug offenses). Although not all youth accused of crime are charged, their engagement in criminal behavior remains a concern. Specifically, within Saskatchewan, youth crime rates are well above the national average and are the highest outside of the Territories (Statistics Canada, 2016).

Guided by the Risk, Need, Responsivity (RNR) model, use of forensic assessment tools plays an important role in efforts to promote the continued decrease of youth crime rates in Saskatchewan as well as throughout Canada. It is important that research continue to develop assessment tools to aid in the accurate identification of risks and needs common to young offenders as well as to identify individual treatment targets and beneficial intervention strategies. While accurate risk assessment is an important component of forensic risk assessment tools, increased rehabilitation and decreased recidivism amongst young offenders are equally top priorities. The current study aims to add to the growing body of research on youth risk assessment and rehabilitation in an effort to contribute to the trend of decreased youth crime in Canada.

1.2 Risk, Need, Responsivity Model

The Risk, Needs, Responsivity (RNR) Model was proposed in 1990 in response to the popular "nothing works" attitude at the time (Andrews, Bonta, & Hoge, 1990; Andrews & Bonta, 2010). Andrews et al. (1990) proposed three principles that are at the core of effective programming, including: the risk principle, the need principle, and the responsivity principle. The risk principle aims to identify the level of risk the individual is at for reoffending (i.e., high, medium, or low). The level of treatment intensity for each individual should be matched to their level of risk in order to reduce the chance of recidivism (i.e., those with a high level of risk to

reoffend should receive high intensity treatment) (Andrews et al., 1990; Andrews & Bonta, 2010). The need principle aims to identify the risk factors that increase an individual's risk of reoffending, these factors are often referred to as criminogenic needs (Andrews & Bonta, 2010a). Finally, the responsivity principle has two parts – general and specific responsivity. General responsivity focuses on the mode of treatment (mainly structured cognitive behavioral therapy). Specific responsivity aims to identify individual factors that may influence how treatment is administered. Commonly explored specific responsivity factors are gender, age, and culture (Andrews & Bonta, 2010).

Over the years it has been well established that the Risk, Needs, Responsivity (RNR) model of rehabilitation can reduce recidivism. Research has shown that recidivism rates can be reduced up to 35 % when all three principles are adhered to (Andrews & Bonta, 2010). A key part of adhering to the RNR model is identifying the individual's level of risk to inform treatment dosage (risk principle) as well as the appropriate targets for rehabilitation, that is, criminogenic needs (need principle). Criminogenic needs are attributes of offenders and their circumstances that, when changed, are associated with decreased rates of recidivism (Andrews, Bonta, & Hoge, 1990). Services in turn, should be adapted to the unique considerations of forensic clients that can impact response to services (responsivity principle).

Part of the success of the RNR model is built on the idea that risk is dynamic and can be changed with appropriate treatment and program adherence. Originally, risk was heavily based on factors that could not be changed (i.e., criminal history) (Bonta, 1996). However, research has shown that some of the variables that contribute to risk of reoffending are dynamic in nature (discussed below) and when positive changes are made to those variables the risk of recidivism can be reduced. Thus, appropriate programming that adheres to the RNR model can reduce recidivism through changing dynamic variables that are related to an individual's level of risk. Understanding that change in risk factors will reduce the likelihood of recidivism for a particular client is paramount to the course of intervention chosen for that client (Kroner & Yessine, 2013). The idea that change is possible is important for young offenders because risk is often considered particularly dynamic for youth given the developmental transitions inherent within adolescence (Olver, Stockdale, & Wong, 2012).

Forensic risk assessments are a method used to aid in identifying the risk, needs, and responsivity considerations of offenders. Risk and need scores contribute to the level of

supervision an offender is assigned, the treatment services provided, and the individualized targets for change (Andrews et al., 2011). Accurate assessment of risk, needs, and responsivity assists in reducing recidivism of offenders and thus measures that accurately assess these three principles are necessary.

1.3 Development of Risk Assessment

Over the years there has been progressive development of forensic tools used to assess risk of recidivism in an offending individual. Before academic research directed assessment, risk was based on what is commonly referred to as gut instinct, intuition, or subjective assessment. This era of assessment is known as the first generation of risk assessment (Bonta, 1996). In 1928 the second generation of risk assessment developed after Burgess's 1928 study of parolee's introduced the first way to systematically and empirically develop an objective risk assessment (Bonta, 1996). The second generation of risk assessment introduced differently weighted variables that were thought to influence the level of risk. Second generation tools had a relationship with risk where, as the number of items endorsed increased, the level of risk also increased; the higher the score, the higher the risk (Bonta, 1996). Later, the third generation of risk assessment evolved and introduced the notion of change, differentiating second and third generation risk assessment tools. Third generation tools linked assessment to the process of rehabilitation, focusing on matching treatment level to the level of risk identified and focusing treatment on the criminogenic needs identified in the risk assessment (Bonta, 1996). Since Bonta's 1996 article the fourth generation of risk assessment tools has been introduced. The fourth generation maintains the qualities of the third generation tools while also introducing a case management component. The case management component strengthens the adherence to the RNR principles by aiding in the identification of responsivity factors that are important to the treatment and risk management of a particular individual (Andrews, Bonta, & Wormith, 2006).

The development of the RNR model and the progression of risk assessment tools was largely based on adult populations. That said, recent research has demonstrated the effectiveness of the RNR with youth samples. Luong and Wormith (2011) demonstrated that when the risk and need principles are adhered to, recidivism can be reduced up to 37.9 % with high risk young offenders. Similarly, youth with a low portion of needs met through therapeutic interventions reoffended significantly earlier than youth who had a high portion of needs met (Peterson-Badali, Skilling, & Haqanee, 2015; Vieira, Skilling,& Peterson-Badali, 2009). Additionally, consistent

with the adult RNR research, robust psychometric support has been marshalled for youth adaptations of clinical forensic adult assessment measures (Olver, Stockdale, & Wormith, 2009; Olver, Stockdale, & Wong, 2012).

1.3.1 *Major Risk Factors*

There have been numerous variables introduced as potential risk factors but Andrews and Bonta (2010a) have summarized the eight best-established risk/ need factors, commonly known as the central-eight risk factors. History of criminal behavior, antisocial personality pattern, antisocial attitude, antisocial associates, family/ marital, school/work, leisure/recreation, and substance abuse make up the central eight risk factors (Andrews & Bonta, 2010a). These eight risk factors have been split into two groups of four; the first group is known as the Big Four (history of criminal behavior, antisocial pattern, antisocial attitudes, and antisocial associates) and the second group is known as the modest four (family/ marital, school/ work, leisure/ recreation, and substance abuse) (Andrews & Bonta, 2010a; Andrews et al., 2011). The Big Four risk factors typically yield predictive validity estimates of recidivism in the area of $r = 0.26$ and the modest four estimates in the area of $r = 0.17$ (Andrews & Bonta, 2010a). Together the central eight risk factors yield predictive estimates of recidivism in the area of $r = 0.41$, indicating a moderate relationship between the central eight risk factors and recidivism (Andrews & Bonta, 2010a).

It is important to note that Andrews and Bonta (2010a) were not reporting that these eight risk factors are the only risk factors that exist. Rather, they were highlighting the importance of these eight domains and the reoccurring pattern of their relationship to recidivism. However, they also note that other risk/ need variables likely exist and eight general domains cannot capture all the variability of an individual offender or case-specific influences on rehabilitation or recidivism. The central eight risk factors are a core group of risk factors that commonly influence recidivism and thus are often included in many of the tools used to identify risk and need (Andrews & Bonta, 2010a). In general, the central-eight risk factors are most commonly associated with risk but they do not exist in isolation and numerous other factors also influence the level of risk and criminogenic needs to be addressed.

There are some adaptations to the central eight risk factors made for youth to reflect developmental norms. For example, within the family/ marital domain the family portion for youth is most important. Similarly, the school portion of the employment/ school domain is

emphasized in youth. In general, the central eight risk factors for young offenders are consistent with the eight domains presented above (Andrews et al., 2012).

1.3.2 *Protective Factors*

In addition to risk factors, protective factors have also recently been used to assist in the assessment of risk, needs, and responsivity. Protective factors can be variables that protect an individual against the effect of stressors, prevent the development of antisocial behavior, decrease the likelihood of criminal behavior, and increase the likelihood of prosocial functioning (de Vries Robbé & Willis, 2017). Research on what constitutes a protective factor has varied. Some researchers suggest that there are direct protective factors that reduce the likelihood of violence, as well as buffering protective factors that reduce the likelihood of violence in the presence of risk (Losel & Farrington, 2012). Other research suggests that the absence of a risk factor can be a protective factor (Lodewijks, de Ruiter, & Doreleijers, 2010). Although the specific definition varies, there is consensus in the research that protective factors reduce the likelihood of maladaptive outcomes (Rogers, 2000). Generally, protective factors can fall in several domains including biological, personality, family, school, peer, and community (Losel & Farrington, 2012).

Research on protective factors has been favorable for use in risk assessment. Rennie and Dolan (2010) looked at the presence of protective factors in a sample of adolescent male offenders in the United Kingdom. They found the mean number of protective factors present in an individual to be 1.5 (range 0-6). They also found that as the number of protective factors present increased, the number of individuals that recidivated decreased. Similarly, Hoge, Andrews, and Leschied (1996) found that the presence of protective factors is significantly related to lower levels of reoffending, more positive adjustment, and higher levels of compliance. Thus, it appears that protective factors can play an important role in predicting and managing risk (Rennie & Dolan, 2010).

Both risk factors and protective factors should be included in intervention planning of young offenders (Lodewijks, de Ruiter, & Doreleijers, 2010). Assessment of protective factors can assist in the evaluation of the level of risk, as well as help identify treatment targets and responsivity considerations (de Vries Robbé & Willis, 2017). Accurate assessment of protective factors is important as it could be beneficial for the accuracy of risk prediction (de Vries Robbé & Willis, 2017). Having an empirically based tool that measures protective factors can help

increase the reliability, validity, and transparency of risk assessment practice, particularly when a tool follows the RNR model (de Vries Robbé & Willis, 2017).

1.3.3 *Risk Assessment with Young Offenders*

The Youth Criminal Justice Act is the Act in Canada that governs the application of criminal law to youth (individuals older than 12 and younger than 18) (Youth Criminal Justice Act, 2015). Within the Act, section 34 speaks to the use of risk assessment with young offenders. The act states that the court may require the young person to undergo a psychological assessment if it is believed a report is necessary to make decisions regarding release from detention/ custody, adult sentencing, making or reviewing a youth sentence, continuation of custody, setting conditional supervision conditions, making conditional setting orders, or authorizing disclosure of information about a young person.

Risk Assessments for young offenders consist of numerous sources of information in order to capture the most accurate and objective view of the youth and their environment. One piece of that risk assessment is the use of forensic tools to objectively identify the level of risk and the criminogenic needs of a youth so that decisions regarding the treatment and programming of each individual can best fit with the youth needs and the RNR model. Over the years there has been an increasing focus on the development of measures to assess young offender risk. These measures are often modified versions of the adult counterpart, adapted to fit the developmental stage unique to young offenders. The measures chosen for this study are described below.

1.4 Forensic Tools and Their Use with Young Offenders

There have been many reputable tools developed to assess static and dynamic risk factors in young offenders (de Vries Robbé, Geers, Stapel, Hilterman, & de Vogel, 2015; Olver, Stockdale, & Wong, 2012; Olver, Stockdale, & Wormith, 2009; Stockdale, Olver, & Wong, 2010; Stockdale, Olver, & Wong, 2014). While many of these tools are specialized instruments designed for different purposes (i.e., assessing violence), a common purpose is to identify at risk youth for risk management interventions to prevent reoffending (de Vries Robbé et al, 2015; Olver et al., 2012; Stockdale et al., 2014; Stockdale et al, 2010). Evidence shows that when the level of treatment matches the risk level and criminogenic needs of the youth, recidivism rates drop by up to 25% (Lipsey, 2009). Further, protective factors (i.e., community engagement) serve as a buffer to mitigate risk and promote wellbeing (Lipsey, 2009). Tools that accurately

identify level of risk and protective factors can aid in providing the best treatment for a youth, in turn, reducing the risk of recidivism.

There were five assessment tools chosen for use in the present study, including: the Level of Service Inventory – Saskatchewan version (LSI-SK), the Violence Risk Scale – Youth Version (VRS-YV), the Psychopathy Checklist: Youth Version (PCL: YV), the Structured Assessment of Violence Risk in Youth (SAVRY) and the Structured Assessment of Protective Factors: Youth Version (SAPROF-YV). All five of the tools selected for the present study were originally created for various reasons but they have all demonstrated ability to aid in the process of identifying risk, needs, and responsivity characteristics of young offenders necessary for the treatment and risk management of youth. While there are a large number of risk assessment tools available for use with young offenders, this study will focus on these five risk assessment tools. The focus is on these five tools given their frequent use for risk assessments with young offenders in Canada, specifically within Saskatchewan. The justification for the inclusion of each tool in the current study is presented below in the respective sub-section.

1.4.1 *The LSI-SK*

The Level of Service Inventory (LSI) group of forensic risk tools are the most frequently used tools internationally (Olver, Stockdale, & Wormith, 2014). The LSI tools were designed to identify risk of recidivism, criminogenic needs, and to inform recommendations for case management and community supervision. The LSI-SK is one version of the LSI tools, specifically adapted for use with youth in Saskatchewan (Luong & Wormith, 2011). The LSI-SK was chosen for use in the present study as it is included in all young offender assessments in Saskatchewan (implemented in 2003 by the Saskatchewan Department of Corrections, Public Safety and Policing; Luong & Wormith, 2007).

One study has previously examined the predictive validity of the LSI-SK. which indicates that the LSI-SK is a good predictor of recidivism in young offenders. The study found that after a 16.5 month follow-up the LSI-SK was positively correlated with recidivism for the total sample ($r = .38$), for Aboriginal ($r = .37$) and non-Aboriginal ($r = .33$) offenders, and for male (r = .40) and female ($r = .29$) young offenders (Rector, Wormith, & Banka, 2007). In addition, Luong and Wormith (2011) demonstrated that the LSI – SK total score was positively correlated with recidivism (AUC = 0.73, large effect size). Generally, the LSK- SK can be used to inform supervision intensity and interventions toward criminogenic needs (Luong & Wormith, 2011).

In addition to research conducted specifically on the LSI-SK, much research exists on other members of the LS family of tools. Olver, Stockdale, and Wormith (2009) conducted a meta-analysis and found that various forms of the Youth Level of Service (YLS) tools predicted general recidivism ($r_w = 0.32$) and violent recidivism ($r_w = 0.28$). In addition, Olver, Stockdale, and Wong (2012) found that the YLS/ Case Management Inventory (CMI) has strong predictive accuracy for total recidivism (adult and youth) for general recidivism (AUC = 0.71, large effect size), nonviolent recidivism (AUC = 0.71, large effect size), and violent recidivism (AUC = 0.75). These authors also found that the predictive accuracy of the YLS/ CMI was slightly stronger for youth recidivism for both general and nonviolent recidivism (AUC values of 0.77 and 0.75, large effect size) than for adult recidivism (general and nonviolent AUC values of 0.67 and 0.66, moderate effect size). However, the predictive accuracy was similar for violent recidivism for both youth and adult recidivism (AUC values of 0. 74 and 0.75, large effect size). Olver et al. (2012) also found that the YLS/ CMI has strong predictive accuracy for all types of recidivism for Indigenous youth with AUC values ranging from 0.70-0.78 for the various types of recidivism, indicating a large effect size.

In general, the LS group of tools have a large body of literature that supports use as a predictive tool. Research on the LSI-SK specifically shows a promising trend in the same direction. As the LSI-SK is a tool used with all young offenders in Saskatchewan, it is important to demonstrate that it is a validated tool that can be used with all youth – including diverse populations such as females and Indigenous youth. Continued validation of the use of the LSI-SK serves to demonstrate it is a tool that clinicians and judges can rely on to make sound decisions regarding the treatment and management of young offenders in Saskatchewan.

1.4.2 *The VRS-YV*

The VRS-YV is a recently developed tool that was designed to measure therapeutic change and to bridge the gap between the practice of assessment and treatment (Stockdale et al., 2014). Prior to the development of the VRS-YV there were few measures that specifically addressed youth violence and linked assessment to treatment interventions. The VRS-YV differs from many tools in that there is a modified version of Prochaska et al.'s (1992) stages of change model built into the tool. The stages of change model is designed to measure changes in level of risk between time one and time two of rating of the tool, with time one typically being pre-treatment and time two being post-treatment. The change measure of the VRS-YV allows for the

evaluation of change and the alignment of interventions and services available to the youth in response to such changes. The Canadian Psychological Association Task Force recently released an article with recommendations around routine outcome monitoring (Tasca et al., 2019). Although outcome monitoring has always been an important aspect of clinical interventions, the development of the VRS-YV may be a way to bridge the gap in clinical practice with young offenders.

There is some prior research on the predictive validity of the VRS-YV. Stockdale et al. (2014) demonstrated that the VRS-YV has strong predictive accuracy for all types of total recidivism (general, nonviolent, and violent) for Indigenous youth (AUC values of 0.73, 0.73, and 0.72, large effect size) and strong predictive accuracy for total violent recidivism for non-Indigenous youth (AUC = 0.84, large effect size). In addition, these researchers found that the VRS-YV has good predictive accuracy for all types of total recidivism (general, nonviolent, and violent) for male youth (AUC values of 0.84, 0.81, and 0.88, large effect size) and for female youth (AUC values of 0.64, 0.64, and 0.66, moderate effect size). Similar to the trend found by Olver, Stockdale, and Wong (2012) for the YLS/ CMI, the VRS-YV also does a slightly better job at predicting youth recidivism (AUC range 0.64-0.94) than it does predicting adult recidivism (AUC range 0.46-0.82; Stockdale et al., 2014).

Stockdale et al. (2014) also demonstrated that the VRS-YV is a reliable measure. They reported high interrater reliability (ICC = 0.87) and acceptable internal consistency (α = 0.90) for the VRS-YV. They also demonstrated that the VRS – YV has high convergent validity with both the PCL: YV (rs = 0.80) and the YLS/CMI (rs = 0.84).

The VRS-YV is a relatively new tool with minimal research to demonstrate it is a consistently valid and reliable tool to use with young offenders. While Stockdale et al. (2014) have started to demonstrate that the VRS-YV can be used with young offenders (indigenous, non-indigenous, male, and female), more research that supports the use of the VRS-YV with youth will serve to increase reliance on the tool. In addition, more research about the predictive accuracy of the post-treatment scores will serve to identify the usefulness of the stages of change aspect of the tool.

1.4.3 *The PCL: YV*

The PCL: YV was originally designed to measure a variety of affective, interpersonal, and behavioral characteristics related to psychopathy (Forth, Kosson, & Hare, 2003). The PCL:

YV was not designed to assess risk, treatment targets or readiness for change, or to develop a case management or risk reduction strategy (Olver & Stockdale, 2010). However, although it was not originally designed to be used as a risk assessment instrument, research has demonstrated that it can be used to predict recidivism (Edens, Skeem, Cruise, & Cauffman, 2001; Olver, Stockdale, and Wormith, 2009). Although research supports its use as a predictive tool, it may be best to combine the PCL: YV with different risk assessment tools to best identify the risks and needs of a youth and to guide interventions to decrease recidivism. The PCL: YV provides unique information about a youth's characteristics related to psychopathy and thus the use of the tool may matter more in terms of other potential uses rather than only benefits related to predictive accuracy (Olver et al., 2009). There is also some evidence that the different constructs of the PCL: YV predict different types of recidivism, which may be an indication that even within a tool, different components can be helpful in different situations (Stockdale et al., 2010).

Although the tool was not originally designed to assess risk, research has demonstrated the PCL: YV is a valid predictor of some types of recidivism within some populations. Schmidt, Campbell, and Houlding (2011) found that the PCL: YV total score had strong predictive accuracy for nonviolent recidivism (AUC = 0.83, large effect size), violent recidivism (AUC = 0.75, large effect size), and technical recidivism (i.e., failure related charges; AUC = 0.84, large effect size) for male offenders. Predictive accuracy for the three types of recidivism was lower for female offenders but still had a moderate effect size (nonviolent AUC = 0.67, violent AUC = 0.60, and technical AUC = 0.70). Schmidt et al. (2011) had similar findings to Olver, Stockdale, and Wormith (2009), who found that there was a moderate correlation between general recidivism and the PCL: YV (r_w = 0.28), violent recidivism and the PCL: YV (r_w = 0.25), and a small correlation between nonviolent recidivism and the PCL: YV (r_w = 0.16). Stockdale et al. (2010) also had similar findings to Olver et al., finding that the four-factor model of the PCL: YV had strong predictive accuracy for total general (AUC = 0.72, large effect size), nonviolent (AUC = 0.70, large effect size), and violent recidivism (AUC = 0.74, large effect size).

In general, research on the validity of the use of the PCL: YV as a risk assessment tool has been well established. However, ongoing validation of the PCL: YV is important as it was not designed as a risk assessment tool. Additionally, further research is necessary to support its use with diverse populations.

1.4.4 *The SAVRY*

The Structured Assessment of Violence Risk in Youth (SAVRY) was designed to assess the risk of violence in youth (Borum, Bartel, & Forth, 2002). It includes an assessment of dynamic, static, and protective factors related to recidivism. Although it was specifically designed to assess violent risk, the SAVRY has also demonstrated some predictive ability for nonviolent and general criminally involved youth (Meyers & Schmidt, 2008). Prior to the development of the SAPROF-YV, the SAVRY was the only assessment tool designed to measure protective factors in young offenders.

Meyers & Schmidts (2008) found that the SAVRY has strong predictive accuracy for violent recidivism with a three year follow-up (AUC = 0.77, large effect size) for males (AUC = 0.78, large effect size), females (AUC = 0.80, large effect size), Indigenous (AUC = 0.84, large effect size), and Caucasian (AUC = 0.70, large effect size) youth. In addition, they also found that the SAVRY total score yielded AUC's of 0.76 (large effect size) for general recidivism and 0.68 (moderate effect size) for non-violent recidivism for the total sample. Perrault, Vincent, and Guy (2017) reported similar AUC values for the SAVRY for nonviolent (AUC = 0.60, moderate effect size), violent (AUC = 0.69, moderate effect size), and any recidivism (AUC = 0.62, moderate effect size). Singh, Grann, and Fazel (2010) conducted a meta-analysis and found results similar to the above researchers, noting the SAVRY had strong predictive validity of violent recidivism for youth (AUC = 0.71).

Specific to the SAVRY protective factor scale, in a sample of Spanish young offenders, individuals who did not reoffend scored higher (i.e., had more protective factors present) than individuals who did reoffend (AUC = 0.713, large effect) (Ortega-Campos et al., 2020). Similarly, in a sample of US youth, Soderstrom, Childs, and Frick (2020) found that youth who generally recidivated had a lower mean number of protective factors than youth who did not recidivate, but with a low level of predictive accuracy (AUC = 0.44). However, they found no difference between those who recidivated violently and those who did not. These authors also found that the protective factor domain did not add incremental validity to the predictive accuracy of the SAVRY risk domains. Finally, a similar trend was demonstrated in a Canadian sample of young offenders, where high scores on the SAVRY protective domain predicted the absence of reoffending but low scores did not predict the presence of reoffending (Viljoen et al., 2018). Viljoen et al. also found that the SAVRY protective score did not provide incremental

validity over risk scores in predicting any or violent reoffending, however it did inversely predict the presence, speed, and frequency of any new charges (AUC = 0.61) and of new violent charges (AUC = 0.62), over a two-year period.

Further research on the validation of the SAVRY, particularly for nonviolent and general recidivism, will serve to identify the limits of the tool in terms of the types of recidivism it can accurately predict. Additionally, recent research specifically on the SAVRY protective domain speaks to the increasing trend of the use of protective factors in risk assessment. Continued research in this area will add to the growing body of literature on the role of protective factors in risk assessment and the provision of intervention with young offenders.

1.4.5 *The SAPROF-YV*

Finally, the SAPROF-YV was designed to specifically assess protective factors in young offenders (de Vries Robbé et al., 2015). The SAPROF-YV is the only tool included in the present study that focuses solely on protective factors (as mentioned above, the SAVRY includes a section on protective factors).

The SAPROF-YV is a new tool developed in 2015 and thus research regarding its validation has yet to be completed. Research of its adult counterpart, the SAPROF, indicates that it has strong predictive accuracy for non-recidivism of individuals with a violent offense at a three-year follow-up (AUC = 0.74, large effect size) (de Vries Robbé, de Vogel, & de Spa, 2011). It is anticipated that the SAPROF-YV will produce similar results in relation to recidivism of young offenders for violent recidivism. Research of the SAPROF-YV is needed in order to support its use as a valid risk assessment tool to use with young offenders. In addition, the predictive validity of the SAPROF (adult version) has mostly focused on violent recidivism, as such there is little understanding of the relation between protective factors and general and nonviolent recidivism for both adults and youth. The present research looked to understand the validity of the SAPROF-YV for multiple types of recidivism in young offenders as well as add to the understanding of the role of protective factors for case management and intervention with young offenders.

1.5 Forensic Tools and Diverse Populations

There has been substantial controversy around the use of standardized forensic measures with diverse populations such as individuals of Indigenous ancestry or females. Some researchers have suggested that forensic tools should be created that are developed using specific

groups (i.e., only individuals of Indigenous ancestry or only females) (de Vogel & Nicholls, 2016; Guiterrez, Wilson, Rugge, & Bonta, 2013). However, other researchers suggest, and have demonstrated, that the current forensic tools used are valid measures of risk in diverse populations (Meyers & Schmidt, 2008; Olver et al., 2009; Olver et al., 2014, Stockdale et al., 2014,). Those researchers that have demonstrated the latter do not suggest that ethnicity and gender should be ignored, rather they suggest they are potential responsivity factors that should be considered for treatment and case management. However, risk level does not necessarily vary systematically with these variables (Andrews et al., 2012; Gutierrez et al., 2013) but the combination and importance of certain risk factors could differ (Schwalbe, 2008). More research is required to determine how the existing risk assessment tools (such as those being used in the present study) perform with specialized populations such as Indigenous and/ or female youth. The existing research on the use of the tools chosen for the current study with diverse populations is explored further below.

1.5.1 *Indigenous Ancestry*

Despite the decreasing trend of youth crime, the proportion of Indigenous youth in correctional services has jumped from 26 % in 2007/2008, to 43 % in 2017/2018 (Department of Justice Canada, 2019). Although Indigenous youth make up only 8 % of the Canadian youth population, they represent 43% of the youth correctional service population. Historically, in Saskatchewan, Indigenous youth were 30 times more likely to be incarcerated that non-Indigenous youth (Latimer & Foss, 2005). Such overrepresentation is likely due to an interaction of multiple factors including individual life experiences, social, and economic inequalities (Latimer & Foss, 2005) as well as the negative outcomes of a history of residential schools, colonialism, and systemic and institutional racism (Monachalin, 2010).

Recently there has been an increase in the concern about using pre-existing risk assessment tools with diverse populations, such as Indigenous youth. It is important to understand that due to the nature of the history of Indigenous groups in Canada, Indigenous offenders may endorse more risk factors than non-indigenous offenders (Gutierrez, Wilson, Rugge, & Bonta, 2013). Gutierrez et al. note that many Indigenous communities have high rates of poverty and unemployment due to a long history of social marginalization. Poverty and unemployment are both factors that can increase an individual's level of risk as a reflection of the environment rather than of the individual. It is important to note that risk factors are either

present or absent, and there may be different origins of risk factors that are present, but the presence of a risk factor impacts risk regardless of its origin. Given the history of Indigenous Peoples in Canada, the recent increase in concern over valid measurement of risk in this population is warranted and research is needed in order to support the use of these tools in identifying the presence of risk in such a diverse population.

Hannah-Moffitt and Maurutto (2003) note that the broader socio-cultural context of Indigenous youth and the unique aspects of their history are not adequately addressed in risk assessment tools. However, Gutierrez et al.'s (2013) research with a combined sample of youth and adult offenders found that each of the central eight risk/ need factors significantly predicted general recidivism for Indigenous offenders (effect size range 0.19-0.56) as well as violent recidivism (effect size range 0.11-0.45; leisure excluded). The researchers concluded that there does not appear to be a reason to ignore the central eight risk factors when assessing Indigenous individuals, however, they highlight that there is a lack of research on the potential existence of Indigenous-specific risk factors. Gutierrez et al. suggest that emotional problems and history of victimization may be potential criminogenic needs to consider for future research with Indigenous offenders, particularly given their history of marginalization.

Yessine and Bonta (2009) found in a sample of young offenders that Indigenous and non-Indigenous youth showed similar rates and seriousness of involvement in criminal behavior. They also found that the number of violent reconvictions was considerably higher for indigenous youth than non-indigenous youth. Yessine and Bonta did further analyses between youth at high and low risk for both groups and found that accommodation was the contributing factor that differentiated high and low risk non-Indigenous youth while associates, family, and substance use differentiated high and low risk Indigenous youth. Thus, there are clear differences between Indigenous and non-Indigenous youth. However, it is unclear whether these differences influence the predictive accuracy of forensic risk assessment tools or whether they are differences that clinicians need to be aware of in terms of treatment administration and case management.

Despite concerns about applying current risk tools to Indigenous youth, research suggests that tools presently available are valid predictors of risk of reoffending in this population. Specifically, previous research on the VRS-YV suggests that it has moderate to strong predictive accuracy when used with Indigenous youth. Stockdale et al. (2014) demonstrated that the VRS-YV significantly predicted all recidivism outcomes for youth of Indigenous descent, AUC = 0.67

– 0.73 indicating a moderate to large effect size (adult, youth, violent, and general recidivism). Although minimal research is available, the current literature suggests the VRS-YV is a valid predictor of recidivism for Indigenous young offenders.

Olver et al. (2014) had similar findings to Stockdale et al. (2014), regarding the use of the YLS/ CMI with Indigenous youth. These authors established that Indigenous youth scored higher than Caucasian youth on most criminogenic needs, although the predictive accuracy of the YLS/CMI remained moderate to high (AUC = 0.70-0.78) for Indigenous youth, even with significantly higher scores in numerous areas (i.e., the average drugs and alcohol score for Indigenous youth, $M = 4.1$, was significantly higher than the average drugs and alcohol score for Caucasian youth, $M = 2.3$). Similarly, Olver et al. (2009) found that the YLS/CMI has a high to moderate predictive accuracy of recidivism when used with Indigenous youth ($r_w = 0.35$). The LSI-SK demonstrated a similar trend of predictive accuracy with Indigenous youth with the total LSI-SK score predictive of recidivism for Indigenous youth (AUC = 0.643, moderate effect size; Luong & Wormith, 2011). Olver et al. (2014) do caution that discretion should be used with the application of the LS tools, particularly with vulnerable populations who may be experiencing adverse circumstances that may have brought them into contact with the justice system. Although this may not impact the risk rating, it may inform case management and service delivery to help reduce risk and recidivism.

The limited research on the use of the PCL: YV with Indigenous youth suggests that the PCL: YV has good predictive accuracy when used with Indigenous youth to predict general (AUC = 0.72, large effect size), nonviolent (AUC = 0.72, large effect size), and violent recidivism (AUC = 0.71, large effect size) (Stockdale et al., 2010). Similarly, the SAVRY also has limited research about the validity of its use with Indigenous youth. As mentioned above, Meyers and Schmidt (2008) found that it had strong predictive accuracy (AUC = 0.84) in a sample of Indigenous Canadians. Muir et al. (2020) recently added to the literature about the use of the SAVRY with Indigenous youth. The Canadian sample for the study allowed for comparisons between male and female Indigenous and Caucasian youth. The researchers found that the SAVRY total score and the summary risk rating were predictive of any and violent recidivism for all groups (Indigenous males and females, Caucasian males and females; AUC range: 0.66-0.76), except the violence summary risk rating was not predictive of violent recidivism for Caucasian females (AUC = 0.65). The researchers also found that for violent

recidivism there were no significant differences in the AUC values between female Indigenous (AUC = 0.59 – 0.76) and Caucasian (AUC = 0.53 – 0.73) youth, or male Indigenous (AUC = 0.65 – 0.70) and Caucasian (AUC = 0.63 – 0.68) youth. A similar trend was found for females for any recidivism, with no difference between female Indigenous (AUC = 0.59 – 0.77) and Caucasian (AUC = 0.56 – 0.71) youth, and after statistical correction there was also no significant difference for any recidivism between male Indigenous (AUC = 0.61 – 0.70) and Caucasian (AUC = 0.68 – 0.79) youth.

The research on these four tools has thus far indicated that they are valid measures of risk to recidivate for Indigenous youth. However, there is much research to be conducted before the influence of Indigenous ancestry on risk assessment, treatment adherence, and case management can be understood. Many of these avenues of research are beyond the scope of the present study. The current research aims to add to the pre-existing literature on the predictive accuracy of the LSI-SK, the VRS-YV, the PCL: YV, and the SAVRY with Indigenous youth as well as create a literature base for the use of the SAPROF-YV with Indigenous youth.

1.5.2 *Females*

Similar to Indigenous youth, there has been discussion and debate concerning the use of mainstream risk assessment tools with female youth. Many researchers believe that the current risk assessment tools do not adequately capture the unique needs of females (Hannah-Moffatt & Maurutto, 2003). Contrarily, the criminology perspective generally views the factors that are responsible for female crime as the same as the factors responsible for male crime (Bonta, Pang, Wallace-Capretta, 1995; de Vogel & Nicholls, 2016). However, few studies include a sufficient number of females to examine whether gender plays a moderating role on other risk factors (Penney, Lee, & Moretti, 2010). Current research fails to acknowledge that males and females may encounter the criminal justice system through different mechanisms because of their gender (Rettinger & Andrews, 2010). However, research that has had sufficient numbers of females to examine potential gender differences on risk assessment measures has supported gender invariance in prediction findings across risk assessments (Schwalbe, 2008).

Rettinger and Andrews (2010) found that the central eight risk factors (discussed above) accounted for 97% of the total explained variance in general recidivism and 100% in violent recidivism for adult female offenders. These results indicate that the same general risk factors that are problematic for male offenders are also problematic for female offenders. Rettinger and

Andrews also examined variables that are often suggested to be specific to females (i.e., emotional distress, single parenthood status, history of suicide, etc.) and found that they were not helpful in predicting recidivism. These authors concluded that gendered concerns may be best conceptualized as responsivity factors rather than as criminogenic needs.

Research on some of the tools used with young female offenders is consistent with the conclusions that Rettinger and Andrews (2010) make about adult offenders. Stockdale et al. (2014) found that the VRS-YV significantly predicted adult general recidivism for females, AUC = 0.64 – 0.70, indicating a moderate effect size. Similarly, research has demonstrated that the variability of the predictive accuracy for the LSI tools remains unchanged for studies within each gender (Andrews et al., 2011). Olver et al. (2012) demonstrated that there is no evidence of superior predictive accuracy for either females (AUC= 0.68-0.75) or males (AUC = 0.69-0.85) for the YLS/CMI and Luong and Wormith (2011) found that the total LSI-SK score was predictive of female recidivism (AUC = 0.74, large effect size).

Consistent with other forensic assessment tools, the PCL: YV has also generated controversy around the use of the tool with females (Olver & Stockdale, 2010). Some research has supported the predictive accuracy of the PCL: YV when used with female samples, including Schmidt, McKinnon, Chattha, and Brownlee (2006) who demonstrated a Receiver Operating Characteristic (ROC) of 0.59 indicating a small effect size and Stockdale et al., (2010) who found an AUC value of 0.64 indicating a moderate effect size. However, Odgers, Reppucci, and Moretti (2005) found that the PCL: YV was not predictive of recidivism for females, $b = 0.03$, $p = 0.60$, as did Vincent, Odgers, McCormick, and Corrado (2008), $\beta = .02$, $Exp[B] = 1.02$; $\chi^2[1] = .35$, $p = $ n.s.

The SAVRY follows the same trend as the VRS-YV, LS tools, and the PCL: YV. Although items on the SAVRY have mainly been derived from research on male young offenders, research from Finland indicates that the summary risk rating on the SAVRY is a good predictor of violent outcome in adolescent psychiatric and correctional settings regardless of gender (Gammelgard et al., 2012). Similarly, in Canada, Penney, Lee, and Moretti (2010) found that there was no significant difference in the risk classification between males and females on the SAVRY. These researchers also note that the protective factors section of the SAVRY had a similar effect for both male and female youth in that it did not add significant value beyond the risk score. In addition, Penney et al. found that the SAVRY had moderate predictive accuracy for

violent and nonviolent reoffending for both males and females (male violent AUC = 0.64, male nonviolent AUC = 0.69; female violent AUC = 0. 72, female nonviolent AUC = 0.67). As described above, Muir et al. (2020) found similar results for the predictive accuracy of the SAVRY for both Indigenous and Caucasian females for the total score and risk summary score for both any and violent recidivism, with only the risk summary not being predictive of violent recidivism in Caucasian females. In general, the research supports that the risk factors on the SAVRY operate in a similar manner across gender.

It is important to note that although the same risk factors are important for males and females, it does not necessarily mean that the risk patterns are identical or that gender should be ignored (Schwalbe, 2008). It is possible (and very likely) that, both across and within genders, two individuals with the same risk level will require different interventions in order to address unique risk factors to reduce recidivism (Schwalbe, 2008). Andrews et al. (2012) also highlight that there is a difference between exploring whether the risk factors that are relevant to the prediction of recidivism are the same between males and females and exploring whether those risk factors are present to the same extent, are similarly distributed, or exist for the same reason amongst the two groups.

Similar to Indigenous ancestry, there is much research to be garnered before the influence of gender on risk assessment, treatment adherence, and case management can be understood. Again, many of these topics are beyond the scope of the present study. The present study does aim to add to the pre-existing literature on the predictive accuracy of the LSI-SK, the VRS-YV, the PCL: YV, and the SAVRY with female youth as well as create a literature base for the use of the SAPROF-YV with female youth.

<div align="center">1.6 Intervention for Young Offenders</div>

Effective intervention of adolescent delinquent behavior is essential to not only reduce the personal and social costs of victims and family members, but also the financial cost of institutionalizing a repeat offender (Weiss et al., 2013). Counter to the early suggestion that "nothing works" when treating adult or young offenders, clinically appropriate treatment has shown a propensity to reduce recidivism in young offenders (Andrews et al., 1990; Hill, Andrews, & Hoge, 1991; Lipsey, 1999; Lipsey, 2009). Consistent with Andrews et al.'s (1990) proposal of the risk, need, responsivity model being at the core of effective programing, a study of predominantly male youth in Ontario found that there was a significant negative correlation

between the number of needs met during treatment and the number of new convictions ($r = -.48$, $p < .001$; Vieira, Skilling, & Peterson-Badali, 2009). The same study also found that there was a significant negative correlation between the responsivity match and the number of new convictions ($r = -.21$, $p = .02$). There was no correlation between the number of services received and number of new convictions ($r = -.06$, $p = .51$), indicating that saturation of services is not as important as the service match to needs in reducing recidivism. Additionally, the time to new conviction was slower for youth with a moderate or high percentage of needs and responsivity factors matched compared with youth with a low number of needs and responsivity factors matched ($\chi2$ (2, N = 119) = 27.83, p < .001). Although this study did not discuss specific modalities of treatment, in general it supports that treatment based in the RNR principles can be effective in reducing recidivism in young offenders. Similarly, Dowden and Andrews (2000) found that the correlation between the effect size of treatment and the number of criminogenic needs targeted was r = .69, and the correlation between effect size of treatment and the number of non-criminogenic needs targeted was r = -.30, again highlighting the importance of adhering to the RNR principles when administering treatment.

There is literature on the effectiveness of intervention with young offenders for specific modalities of treatment (discussed below), as well as general factors that are related to the reduction of recidivism regardless of the specific brand of treatment used. Lipsey (2009) conducted a meta-analysis that examined factors that characterize the effectiveness of interventions with young offenders. Typical factors most strongly linked with intervention effects include the approach/ modality, the quantity/ quality of the treatment, and the characteristics of the youth receiving treatment. Lipsey (2009) looked at moderator variables including the study methods, the samples, the level of intervention, and the philosophy of the intervention. After controlling for the methodological differences that accounted for a significant portion of variation, he found that the characteristics of the treatment were significant when other variables were held constant. More specifically, he found that interventions that emphasized discipline had smaller effect sizes than interventions that were therapeutic in nature. There was some variation in effect with certain populations, studies with a higher proportion of males had less favorable treatment outcomes and studies with participants with more aggressive/ violent histories showed smaller recidivism effects. Consistent with the risk principle, there was also a greater reduction in recidivism in higher risk individuals. However, when these variables were

controlled for, there was no significant difference in the effect of various intervention modalities included in the "therapeutic treatment" group on recidivism, which averaged about a 13% reduction in recidivism, while interventions based on discipline had a null effect on recidivism and interventions based on deterrence actually increased recidivism (approximately 8%). Additionally, he found no relationship between the level of supervision a youth was under and treatment effects, indicating that both community and correctional treatment are effective.

In an earlier meta-analysis, Lipsey (1999) examined whether or not intervention is effective with high risk youth. He found that there was an average of a 12% reduction in recidivism in treated youth compared to controls, which was similar for youth in either the community or an institutional setting. However, when looking at the general type of treatment, interventions that had the greatest impact reduced recidivism by up to 40%. The type of treatments included individual counselling, interpersonal skill training, and behavioral programs for youth in the community, and interpersonal skills programs and teaching family in the home for institutionalized youth. In general, Lipsey (1999) concluded that although not every intervention works for every individual, research supports that on average interventions that have been studied reduce recidivism and that the effect an intervention has may vary more with how it is adhered to rather than specific sample characteristics. Haerle (2016) also looked at dose of treatment (measured by time in treatment) for a violent offender treatment program, and found that any dose of treatment reduces recidivism by approximately 14%, but similar to Lipsey (1999), a strong dose of treatment can reduce recidivism by up to 40%. Without looking at specific modalities of treatment it is clear that quality treatment that adheres to the RNR principles of sufficient quantity can have a significant impact on recidivism rates, even in higher-risk more violent youth.

1.6.1 *Specific Treatment Modalities*

Two specific treatments, Multisystemic Therapy (MST) and Functional Family Therapy (FFT), are popular modalities of treatment that have garnered significant attention when it comes to treating juvenile delinquency (e.g., Celinska, 2015; Curtis, Ronan, & Borduin, 2015; Hartnett et al., 2017; Sexton & Turner, 2010; van der Stouwe et al., 2014). MST is an empirically validated family and community-based intervention for adolescents presenting with anti-social and criminal behavior (Greenwood, 2008). While FFT is an empirically validated therapy that combines systemic and cognitive-behavioral theories to address range of behavioral problems in

youth and their families (Robbins et al., 2016). MST is typically considered a more intensive service than FFT, as it includes communities outside the home that the youth may be involved in (e.g., school) and the therapist is also available 24 hours a day seven days a week for crisis intervention (Eeren et al., 2016).

An abundance of research has been completed on the use of MST with young offenders, with most of the findings summarized in three different meta-analyses (Curtis, Ronan, & Borduin, 2004; Littell et al., 2005; van der Stouwe et al., 2014). Curtis et al. (2004) conducted a meta-analysis that contained 11 different studies with seven distinct populations. Across the studies, the average effect size of treatment on various outcome variables (e.g., reducing emotional and behavioral problems, improving family relations, decreasing aggression, and decreasing youth criminality) was d = 0.55, but effect sizes varied from -0.02 to 5.79. Treatment effects were larger for family relations than individual adjustment or peer relations, which fits with the family emphasis of MST. The study also found a moderator of therapist, where studies that included graduate student therapists receiving more rigorous supervision had a significantly higher effect. Littell et al. (2005) completed a meta-analysis shortly after that included studies from eight independent samples, including an Ontario based study that was deemed 'independent' as it was not conducted by researchers linked to the development of MST. Contrary to Curtis et al., Littell et al. found that MST was no more effective than other services but suggest the small number of studies may have decreased power. Of note, Littell et al. also found a wide range of effect sizes, with the 'independent' study demonstrating the lowest effect size. However, Littell et al. suggest that this may reflect poorer adherence to MST, rather than a bias in the other research conducted. More recently, van der Stouwe et al. (2014) completed an updated meta-analysis with 22 studies, all with samples of either antisocial or delinquent juveniles. They found that MST had a small effect on psychopathology, family factors, out of home placements, substance use, peer factors, and general recidivism compared to the comparison groups. After controlling for a publication bias, only the effect on psychopathology and family factors remained significant, however, the authors suggest that controlling for the publication bias likely yielded an overly conservative estimate and that interpreting the uncontrolled analyses is justifiable. Of note, the authors also found several moderating factors including treatment characteristics (MST had a larger effect when compared to single non-multimodal control groups) and completion/dosage (more treatment completers and longer

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treatment duration led to larger MST effects). In general, all three MST meta-analyses provide evidence that MST is an effective method of treatment with young offenders, however, the effects may be small or even negligible if the treatment is too short or not adhered to properly.

Similar to MST, there is also an abundant amount of research supporting the use of FFT as an intervention for young offenders. A meta-analysis, conducted by Hartnett et al. (2017), included 18 different studies dispersed across six different comparisons that differed on the type of comparison group (control, treatment as usual, and alternative treatment) and design type (random or nonrandom). Although the small number of studies included in some of the comparisons (e.g., FFT versus alternative treatment, nonrandom $k = 2$), in general the effect size of FFT over the comparison group was in the small to moderate range for various outcome variables (e.g., recidivism, substance use, behavioral problems). Individual studies have demonstrated similar findings. Gottfredson et al. (2018) found that youth who received treatment as usual were two and a half times more likely to recidivate during treatment than youth who received FFT. They also found that significantly fewer youth in the FFT group had a new drug offense in the year following treatment compared to the treatment as usual group (8 and 13%) and across the entire 18-month follow-up period (11 and 22%). The FFT group also had a smaller percent of adjudicated delinquents (23 versus 38%). Sexton and Turner (2010) had similar results, when FFT was practiced with model specific adherence there was significant reduction in felony (34.9%) and violent (30%) crimes. Celinska (2015) also found that the treatment was effective for both mandated and non-mandated youth, but also suggests that effectiveness depends on the quality of FFT therapists and on the fidelity to the model.

Two European-based studies have also attempted to compare the effectiveness of MST and FFT with each other. Both studies used propensity score matching to control for the differences in the types of individuals referred to each service. As MST is the more intense service, individuals that are higher-risk with more criminogenic needs are typically referred to this service while FFT is reserved for lower-risk youth. After treatment samples were matched, Baglivio et al. (2014) found that higher risk MST youth recidivated at a higher rate than higher risk FFT youth, female youth referred to MST had higher offense rates during services than the FFT females, and low risk youth referred to MST had higher rates of new arrests than the FFT low risk youth. The authors provide little explanation as to the differences, but note that they were not able to control for selection bias and had no measure of parental engagement or

therapist adherence. They also highlight that the many non-significant differences may suggest that from a cost-benefit perspective, the more economically friendly FFT may be a better choice than MST. Similar to Baglivio et al., Eeren et al. (2018) also found few differences when comparing youth who received MST to youth who received FFT. Eeren et al. did not have a specific recidivism outcome variable, instead they used self-report and caregiver reports of externalizing behavior, and therapist scoring of living at home, police contact, and engagement in school or work. The only significant difference they found between the two groups was that youth referred to MST were more likely to be engaged in school or work at the end of treatment. As a means to separate high risk and low risk youth in each treatment, Eeren et al. also compared youth with no court order in the MST group to youth with no court order in the FFT group and found that youth in the MST group had significantly lower externalizing problem behavior scores (small effect). However, when they attempted to make the same comparisons with youth who had court orders, the samples could not be balanced and thus analyses could not be completed.

In general, both MST and FFT are well validated modalities of treatment. However, both require extensive support for training, implementation, and monitoring (Lipsey & Howell, 2012) and may rely on treatment fidelity for significant effects (Curtis et al, 2004; Sexton & Turner, 2010). Evidence from broader meta-analyses highlight the importance of RNR based treatment focused on criminogenic needs as a means to reduce recidivism (Dowden & Andrews, 2010; Lipsey, 1999; Vieira et al., 2009). Thus, even when delivery of MST or FFT may not be feasible, it is still possible to treat young offenders using more general therapeutic approaches. Accurate assessment is a key component of effective treatment as treatment targeting needs that have been assessed as relevant is effective at reducing recidivism (Vieira, Skilling, & Peterson-Badali, 2009). Without accurate assessment of risk and needs, one cannot expect to provide relevant, risk-reducing treatment.

<center>1.7 Rationale for Current Study</center>

Four of the five risk assessment measures being used in this study (the VRS-YV, the LSI-SK, the SAVRY, and the PCL: YV) have all had past research examining their psychometric properties, including predictive accuracy, in various young offender samples. The present study aimed to contribute to the pre-existing literature of these tools to assist in further validation of their use in a Saskatchewan adolescent offender population.

More specifically, the present study provided further research examining a specialized tool, the VRS-YV. The VRS-YV was contrasted to the other youth forensic assessment risk-need tools to determine how well the VRS-YV could predict recidivism and inform treatment interventions to reduce recidivism for youth with violent and nonviolent criminal convictions.. The present study enabled further examination of the newly developed VRS-YV and the extent to which identification of treatment targets, assessment of protective factors, and coordination of services are associated with lower rates of criminal recidivism (Olver et al., 2012; Olver & Stockdale, 2010; Stockdale et al., 2014).

The present study also aimed to add to the specific literature about the use of these risk assessment tools with diverse populations (i.e., females and adolescents of Indigenous descent). The results of the previous literature are mixed on whether the tools used in the present study can be used to accurately predict risk in these diverse populations. Despite much research into the use of forensic assessment tools amongst diverse populations, controversy remains about the reliable use of these tools to assess risk of recidivism. Accurate assessment of risk and criminogenic needs of all young offender groups is important as risk and needs inform treatment which in turn may lead to decreased recidivism. The present study aimed to add to the research on the ethnoculturally sensitive use of forensic assessment tools amongst diverse populations in an effort to ensure that all young offenders can be assessed fairly in a way that is beneficial to their treatment and rehabilitation.

Finally, there is little research on protective factors or how they interact with dynamic risk factors and service delivery to promote reintegration and recidivism reduction. The present study also looks to develop a literature base for a specific measure of protective factors, the SAPROF-YV, particularly in regard to its use with youth who have violent criminal convictions, to add to research about the relationship between protective factors and risk in youth.

1.8 Hypotheses

1. **Hypothesis:** The VRS-YV, PCL: YV, SAVRY, and LSI-SK total and component/factor scores will be positively correlated at moderate to high magnitude, demonstrating measurement of a common underlying construct of violence risk. Conversely, SAPROF-YV scores will be negatively correlated with the aforementioned risk measures, indicating that higher levels of protection are associated with lower levels of criminogenic risk.

2. **Hypothesis:** The VRS-YV, PCL: YV, SAVRY, and LSI-SK total and component/factor scores will have significant predictive accuracy for violent, nonviolent, and general community recidivism over the follow-up period; that is, higher scores will discriminate recidivists from nonrecidivists. Conversely, higher SAPROF: YV scores will be associated with non-recidivism.

3. **Hypotheses:** Recidivism predictive accuracy of the VRS-YV, PCL: YV, SAVRY, and LSI-SK total and component/factor scores will be invariant across gender and ethnicity; that is, these measures will show moderate to high predictive accuracy for violent, nonviolent, and general recidivism among male, female, Indigenous, and non-Indigenous youth. Conversely, the SAPROF-YV will be associated with decreased recidivism among gender and ethnocultural groups.

4. **Hypothesis:** The VRS-YV, PCL: YV, SAVRY, and LSI-SK total and component/factor scores will show good properties of calibration in the sample as a whole, and among specific gender and ethnocultural subgroups. That is, increasing scores, and risk bands representing risk categories (e.g., low, medium, high, or Levels 1 through 5) will be associated with successively higher rates of recidivism. The same risk score will be associated with different rates of recidivism among the groups, specifically, female youth will have lower levels, while Indigenous youth may have higher rates of recidivism associated with a given score.

5. **Hypothesis**: Indigenous youth will score higher on VRS-YV, PCL: YV, SAVRY, and LSI-SK total and component/factor scores than non-Indigenous youth. Moreover, male youth will score higher than female youth.

6. **Hypothesis**: Power permitting, static and dynamic risk tools will have incremental predictive validity for recidivism outcomes, controlling for individual differences in follow-up time. Possible incremental predictor parings for the regression models are as follows:
   - VRS-YV static and dynamic item totals
   - VRS-YV dynamic and PCL-YV total
   - VRS-YV total and SAVRY total
   - SAVRY total and PCL-YV
   - LSI-SK and PCL-YV
   - VRS-YV and LSI-SK

7. **Hypothesis**: For youth receiving therapeutic services through the Young Offender Program, significant pre-post differences are anticipated to be seen on the VRS-YV dynamic items. Change scores, in turn, will be positively correlated with protective factors (SAPROV: YV scores). Finally, changes on the VRS-YV will be associated with deceases in recidivism after controlling for the VRS-YV baseline risk score.

8. **Hypothesis**: Service engagement and recidivism

    a) Youth that are more engaged in treatment will have lower rates of general, violent, and nonviolent recidivism.

    b) Youth with higher SAPROF-YV scores will be more engaged in treatment.

    c) Youth with higher PCL: YV scores will be less engaged in treatment.

2. METHOD

2.1 Sample

The present study was a retrospective archival investigation. Assessment and Treatment files located at the Youth Resource Centre (YRC), the adolescent mental health facility where young offenders can be referred for court-ordered assessment or treatment in Saskatoon, Saskatchewan were examined. Files included a diverse sample of 451 youth on community supervision or serving custodial sentences in Central Saskatchewan. The youth varied with respect to gender, ancestry, and nature of their offense (i.e., violent, nonviolent, sexual). The study gathered information on all consecutive admissions processed at YRC between 2008 and 2012 (and some files from the latter half of 2007 that were still stored at YRC) to reach the sample size. Basic demographics (i.e., age, gender, ancestry), criminal history (i.e., index offense), number of criminal convictions (i.e., violent and non-violent), age at first conviction, and sentencing information (i.e., custodial or community sentence) were collected and four structured forensic measures were rated from file information. The files varied in the quality and quantity of information; thus, it was not possible to code all variables for all the files, 257 files of the 451 (57%) had enough information to rate the forensic measures. Depending on the quality of reports in the file, the forensic measures could sometimes be scored from a psychological assessment report. However, usually at least one type of assessment report and a pre-sentence report were necessary in order to have sufficient information to score the tools. Often tools could not be scored because of either missing historical information or missing information regarding the index offense. All variables, except the gender variable, were missing information, the valid frequencies are presented below along with the percent of missing information. Key sample characteristics are included in Table 2.1.

The mean age of the total sample upon first contact with YRC (determined by the difference between the opening date of the assessment file, or if unavailable the treatment file, and the birthdate) was 16.6 ($SD = 1.6$) years. Information about age (either the birthdate or opening date) was not included for three files. The total sample consisted of 333 males (74%) and 117 females (26%). Approximately 77.5% of the sample were of Indigenous ancestry (determined by application of the Gladue ruling in a pre-sentence report), 11% were not Indigenous (no mention of specific ethnicity but the Gladue ruling was not applicable), 9.5% were Caucasian and 2% were 'other' (e.g., African American, Portuguese, Asian, etc.); 32% of

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the sample did not have enough information to code ethnicity. For the purpose of the present study, ethnicity was collapsed into two groups: Indigenous (77.5%) and Non-Indigenous (22.5%). Most of the youth (52%) were living with a parent (birth, step, or adoptive) with 11% living with both birth parents, 16.5% of youth were living with other relatives, 14% were in Foster Care, 9% were in custody (only used when no other living arrangement information was available), 8.5% had some other living arrangement (e.g., friends, independently, etc.), and 10% were missing this information.

The average last year of education completed was Grade 8.4 ($SD = 1.4$) and the average year of ongoing education was Grade 9.5 ($SD = 1.4$). Twenty-four percent of files were missing this information. Overall, 43% of the sample were attending school at the time of arrest, 57% were not attending school at the time of arrest, and 25% of the sample did not have sufficient information to code. Over half the sample had been suspended or expelled (83.5%), 16.5% had never been suspended or expelled, and 33% had missing information. Most of the sample were either never employed or frequently unemployed (71%), a portion did not have employment for one full year (26%), a small percent (2.5%) were employed full time for more than one year, and 37% were missing this information. Most youth were not employed at arrest (86%), only 14% of the sample was employed at arrest, and 48% of the sample was missing this information.

Regarding criminal history, 73% of the sample had at least one previous conviction, 27% had no previous convictions, and 42% did not have this information in the file. The mean number of previous convictions was 9.3 ($SD = 10.8$) with a range of 0-48. Of those who had a previous conviction, 58% had a previous violent conviction, 41% had no previous violent convictions, and 1% did not have this information. The mean number of previous violent convictions was 0.9 ($SD = 1.5$), while the mean of previous nonviolent convictions was 8.5 ($SD = 10.3$), and the mean number of total previous nonsexual convictions was 9.3 ($SD = 10.8$). Again, of those who had a previous conviction, 3% had a previous sexual conviction, 96% did not have a previous sexual conviction, and 1% did not have sufficient information to code. The mean number of previous sexual convictions was 0.03 ($SD = 0.2$). Approximately 60% of the total sample had at least one prior breach, while approximately 40% did not have a prior breach, and 42% did not have this information. The mean number of previous breaches was 4.7 ($SD = 6.4$). Finally, 83% had never attempted escape, 17% had an attempted escape, and 51% were missing this information.

Information about the index offense(s) (i.e., the offense(s) that brought the individual into contact with YRC during the 2007-2012 time period) was also collected. Index offenses were coded as either nonviolent nonsexual, violent nonsexual, or sexual. A nonviolent nonsexual offense was defined as any offense that does not have a direct victim including offenses such as drug convictions, theft, and breaches of community supervision orders. A violent offense was defined as any offense that included a victim that had a high chance of injury, death, or deprivation, with actual or perceived use of physical violence or threatening behaviors such as arson, robbery, and assault. Sexual offenses were coded as either contact sexual offenses, defined as a physical interaction between the offender and the victim such as sexual assault, or as noncontact sexual offenses defined as no physical interaction between the offender and the victim such as sexual invitation. For the purpose of this study, contact and noncontact sexual offenses were combined. Overall, the mean number of index offenses (for those that had this information available), was 5.5 ($SD = 6.3$) with a range of 1-64. Approximately 26% of the sample had a nonviolent, nonsexual index offense, 60% had a violent nonsexual index offense (youth in this group may also have had a nonviolent index offense but were only coded in this category), 14% had a sexual index offense (youth in this group may also have had a violent nonsexual and/or nonviolent index offense but were only coded in this category), and 13% of the sample did not have this information on file.

Table 2.1

Sample Characteristics

Measure	Mean (SD)	Frequency (%)
Demographics		
Age at first contact	16.6 (1.6)	-
Gender – male	-	74
Indigenous Ancestry	-	78
Living with at least 1 parent	-	52
Last grade completed	9.5 (1.4)	-
Attending school at arrest	-	43
Suspended or expelled	-	84
Predominantly unemployed	-	71
Unemployed at arrest	-	86
Criminal History		
Previous convictions	9.3 (10.8)	73
Previous violent convictions	0.9 (1.5)	58
Previous nonviolent convictions	8.5 (10.3)	-
Previous nonsexual convictions	9.3 (10.8)	-
Previous sexual convictions	0.03 (0.2)	3
Prior breaches	4.7 (6.4)	60
Attempted escape	-	17
Index Offense(s)		
Number of offenses	5.5 (6.3)	-
Nonviolent, nonsexual index offense	-	26
Violent, nonsexual index offense	-	60
Sexual index offense	-	14

2.2 Materials

Assessment and treatment files of past young offenders accessed at the YRC were used to inform coding of the data collection protocol as well as four of the forensic tools listed below, including the Violence Risk Scale – Youth Version (VRS-YV), the Psychopathy Checklist: Youth Version (PCL: YV), the Structured Assessment of Violence Risk in Youth (SAVRY), and the Structured Assessment of Protective Factors: Youth Version (SAPROF-YV). Level of Services Inventory: Saskatchewan Version (LSI-SK) was gathered directly from file information

when available. Outcome data were gathered through the Canadian Police Information Centre (CPIC) criminal records provided by the RCMP.

2.2.1 *Violence Risk Scale – Youth Version (VRS-YV)*

The VRS-YV is a clinician-rated scale designed to assess risk for pre- and post-treatment violence and aid with treatment planning for youth. It consists of 23 items (4 static/stable, 19 dynamic) all rated based on a thorough file review and a semi-structured interview (file review alone can be used for research purposes) (Stockdale et al., 2014). Items are rated on a four-point (0,1,2,3) ordinal scale in which higher ratings indicate a closer link to inappropriate behaviors and an increased violence risk. Items rated as a 2 or 3 during the pre-treatment rating are considered criminogenic needs and are intended targets for treatment. Possible total scores range from 0 to 69. The VRS-YV also evaluates changes in violence via a modified version of the stages of change model. The stages of change include precontemplation, contemplation, preparation, action, and maintenance. The stage of change is only rated for items that are identified as a criminogenic need (i.e., those items that receive a rating of 2 or 3 on the ordinal scale). During the pre-treatment rating these items are assigned a stage of change to specify the youth's motivation and readiness for change. At post-treatment, the stages of change are re-rated for these items. Progression through the stages of change demonstrates the development of improved skills, signifying positive change and risk reduction. Advancement from one stage to the next is scored as a 0.5-point reduction in the pre-treatment rating of the item, progressing two stages is a 1.0-point reduction, etc. However, there is no reduction given for progression from pre-contemplation to contemplation as there is no behavioral change or risk reduction associated at this level. It is also possible to have a reduction in the score of the stable items, although this is less common. As young people have more opportunity to change, the stable items may have some variation and may change as the youth continues to mature (e.g., they may change caregivers or have an improvement in their home environment, resulting in a change of stable score). The point deductions at post-treatment are summed across all items to arrive at a total change score, which is then subtracted from the total pre-treatment score, providing a total post-treatment score. Item scores may also increase from pre-treatment to post-treatment.

2.2.2 *Psychopathy Checklist: Youth Version (PCL: YV)*

The PCL: YV is a 20-item symptom construct rating scale designed to assess behaviors and personality characteristics associated with juvenile psychopathy. The PCL: YV is a

developmentally modified version of its adult equivalent, the Hare Psychopathy Checklist – Revised (PCL-R) (Olver & Stockdale, 2010). Items are scored on a 0 (absent), 1 (partially or possibly present), 2 (present) scale with possible total scores ranging from 0 – 40. The items in turn can be organized into four factors: affective, interpersonal, lifestyle, and antisocial. Campbell, Pulos, Hogan, and Murray (2005) demonstrated that the PCL: YV has strong inter-rater reliability with an average weighted inter-rater reliability coefficient of 0.91. However, substantial heterogeneity does exist suggesting the PCL: YV has strong overall reliability but there are cases in which weaker and possibly unacceptably low levels of reliability are obtained (Olver & Stockdale, 2010).

2.2.3 *Structured Assessment of Violence Risk in Youth (SAVRY)*

The SAVRY was specifically designed to assess risk of future violence for youth (Olver et al., 2009). The SAVRY is a 30-item risk assessment guide that consists of 10 historical risk factors, 6 social/contextual risk factors, 8 individual/clinical risk factors, and 6 protective factors (Olver et al., 2009). The 24 risk items are each rated as low, moderate, or high whereas the 6 protective factors are rated as present or absent. The SAVRY is a structured professional judgement (SPJ) tool where the overall level of risk is based on the clinicians' judgement, informed by the number of risk factors and protective factors endorsed on the tool.

2.2.4 *Structured Assessment of Protective Factors for Violence Risk (SAPROF-YV)*

The SAPROF-YV is designed to assess protective factors in juvenile offenders to be used in conjunction with other risk assessment tools to assess risk and inform treatment. The SAPROF-YV is a 16-item measure including 4 resiliency items, 6 motivational items, 3 relational items, and 3 external items. As with the SAVRY, the SAPROF-YV is a structured professional judgment tool given that items are rated, but not summed to yield total scores. Rather, raters examine the profile or configuration of items to determine overall level of protection and strengths that mitigate risk. Items are also rated on a three-point scale (0, 1, 2) corresponding to the degree to which the protective attribute is present for the young person. The SAPROF-YV is combined with a risk-specific measure to determine the level of risk and the level of protection. The SAPROF-YV is a relatively new tool (English version introduced in March, 2015) that has yet to generate research into its psychometric properties.

2.2.5 *Level of Service Inventory – Saskatchewan Youth Edition (LSI - SK)*

The LSI - SK is composed of 45 static and dynamic risk items that are consistent with the central eight risk domains. Individual items were modified from the adult version to suit adolescents ages 12-18 (Luong & Wormith, 2011). The total risk/ need score is collapsed into five risk levels ranging from very low to very high. The tool also includes sections devoted to specific risk/ need items designed to address violence, non-criminogenic needs, responsivity considerations, and a profile that assists with a case management plan. Unlike most versions of the LSI tools, the LSI – SK does not include a clinician override feature (where the clinician can assign a level of risk that does not match the score); therefore, the risk level for the LSI-SK is derived solely from the general risk/need score (Luong & Wormith, 2011).

2.2.6 *Data Collection Protocol*

A data collection protocol (Appendix E) was developed for the recording of file information regarding several variables required for exploring the proposed areas of examination of this study. These key variables included offender demographics, criminal history, index offense information, treatment information (i.e., type of treatment received), and service engagement (i.e., number of therapy sessions attended, yes/no treatment completed).

2.2.7 *Outcome Variables*

The current study followed up on youth for approximately nine years in the community; recidivism data were collected from the Canadian Police Information Centre (CPIC). Adapted from Stockdale et al. (2014) and Guebert and Olver (2014), the operational definitions of recidivism, violent recidivism, and non-violent recidivism were as follows: Recidivism is defined as any conviction following the youth's first release into the community from a custodial setting or following his or her assessment at the community facility for youth who were on probation only. Recidivism was binary coded (yes or no) for violent, non-violent, and general recidivism along with the sentencing dates for new youth and adult offenses. Violent recidivism included any conviction for a violent offense where the victim had a high chance of injury, death, or deprivation including sexual offenses, actual or attempted use of physical violence, and threatening behaviors such as arson and robbery. Given the low base rate of sexual recidivism and lack of power for significant results, in line with Stockdale et al. (2014), sexual recidivism was combined with violent recidivism. Nonviolent recidivism included any reconviction for nonviolent offenses including drug offenses, theft, and breaches of community supervision

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orders. General recidivism included any reconviction, including technical violations. Time to new conviction was calculated using release and recidivism sentencing dates to permit execution of survival analysis. Finally, the Cormier-Lang scale was used to code the severity of the accumulation of new recidivism events.

2.3 Procedure

All files archived at the Young Offender Program Youth Resource Centre (YRC) from the years 2008-2012 (inclusive) were accessed on site. Some files from the latter half of 2007 were also included. Youth court and treatment files were accessed, assessed for quality, and the forensic study measures were completed if the files had sufficient detail. Due to the variability in what was included in each file it was not possible to rate the forensic tools on all 451 files accessed. Data collection protocol sheets were completed on all cases and a total of 257 files were determined to have sufficient information to rate the forensic tools being examined. A master list was created for all 451 youth so further file information pertaining to the youth' LSI-SK scores could be accessed from a separate location and so recidivism information could be acquired from the Canadian Police Information Centre (CPIC).

The procedure for reading and rating file information varied slightly depending on the type of file accessed. If a court file was selected, the student researcher who selected the file would read all information included in the file, which varied from file to file, but would include information such as: psychological assessment report, youth worker presentence report, psychiatric report, interview notes, and other information sources. Files sometimes included multiple opening dates, with information in the file covering all admissions to the YRC. In these cases, the last admission was used as an opening date and all information in the file was used in the coding process. By using the last opening date contaminated information was minimized, but if the rater who pulled the file found the information was contaminated, then they followed the same procedure outlined below for treatment files. If there was no contaminated information in the file, then the data protocol sheet was filled out with as much information as possible. After all information had been read the forensic tools were then rated based on the information in the file. The order in which the forensic tools were rated was not systematically controlled. The only influence on the order of tools was that the SAPROF-YV could not be rated first as a measure of risk was needed in order to complete the scoring of the tool.

If a treatment file was selected and no court file existed, the student researcher who selected the file would read the file and filter the information. Treatment files could sometimes include treatment and/or recidivism information that would contaminate pre-treatment ratings, thus the individual who did not filter the information would code the file in order to avoid as much contamination as possible. The student researchers systematically separated assessment and treatment information to allow review of assessment information before review of treatment information. After the first student researcher filtered the file, the second student researcher would then code the file, first reviewing the assessment information and following the procedure above for court files, and then reviewing the treatment information to score post-treatment information on the VRS-YV.

If an individual had both a court and a treatment file, the court file was reviewed first (often sequentially appearing first amongst all the files) and the court file procedure was followed. The treatment file was filtered by the student researcher who did not code the court file, however only treatment information was systematically separated when a court file existed (as no assessment information was needed since pre-treatment scores had been completed from the court file). Again, this ensured that no recidivism information would contaminate the rating of post-treatment information. If an assessment file had appeared first and the tools had not been rated due to insufficient information then, assessment information would also be systematically separated in a treatment file for the original researcher of the assessment file to review. If the researcher determined that there was enough information to code the tools, they followed the above procedure, first coding the tools and then reviewing the treatment information. If it was determined that there was still not enough information to code the tools, the treatment information would still be reviewed and coded on the data collection protocol.

One research supervisor completed coding of all study measures with the student investigators on the first 4 cases, with scores being reviewed and discrepancies resolved through consensus. When adequate correspondence had been achieved (determined by the research supervisor), the student researchers commenced autonomous coding. As noted above, a portion of files were randomly selected to be co-coded to complete inter-rater analyses to ensure integrity of data collection (analyzed via intraclass correlation, two-way mixed effects, single rater). Twenty-seven files were coded by both raters to establish inter-rater reliability. To comply

with the procedures outlined above and to avoid contamination on treatment files, only court files were able to be co-coded.

Outcome data were requested from the Canadian Police Information Centre (CPIC), a national electronic database of officially recorded criminal charges and convictions. Hard copies of the information were couriered to the study supervisors in September, 2019 and January, 2020 and stored at the University of Saskatchewan. CPIC outcome data were coded by the student researchers and the research supervisors. The CPIC information was used to code the index offense (as previously identified during file coding), the date of the first new youth general, violent, and/or nonviolent offense, the date of the first new adult general, violent, and/or sexual offense, the number of new general, violent, and sexual offenses, the number of charges that did not result in convictions (general, violent, and sexual), and the number/ nature of any new violent offenses.

2.4 Data Preparation

Prior to conducting inferential statistical analyses (described below), a series of statistical procedures were completed to prepare the data for further analysis. First, change scores on the VRS-YV were calculated by subtracting the pre-treatment score from the post-treatment score. Next, in order to conduct survival analyses, time to recidivism was calculated by subtracting the release date from the date of recidivism (for a new sexual, violent, or general offense, as an adult, and as a youth). For youth who did not recidivate as young offenders the release date was subtracted from the date the individual turned 18. For youth who did not recidivate as an adult, or ever, the release date was subtracted from the CPIC date. If an individual did not have a release date (i.e., the information was not available or the individual served a community sentence for the index offense), the opening date of the assessment or treatment file was used in place of the release date. Finally, the interrater reliability of the risk assessment measures total scores and factor/component scores were assessed using single measure intraclass correlation coefficients (ICC's single measure). The internal consistency or reliability of the total and factor/component scores was also examined using Cronbach's alpha. It is also noted that due to the large number of statistical analyses performed in this study, this can increase the potential for familywise error (i.e., some effects obtaining significance due to chance); this can be mitigated by making a priori predictions and planned purposeful analyses.

2.5 Data Analytic Plan

2.5.1 *Validity of Risk Assessment Measures*

2.5.1.1 *Convergent Validity*

Pearson correlation coefficients were computed between all assessment measure total and factor/ component scores. Correlation coefficients represent the magnitude of a relationship between two variables, ranging from +1.0 to -1.0, with 0 indicating no relationship and +/- 1.0 indicating a perfect relationship. Positive correlations indicate that as one variable increases so does the other (e.g., risk score on one tool and risk score on another tool) and negative correlations indicate that as one variable increases the other variables decreases (e.g. protective score and risk score). Correlations between two continuous measures can be interpreted as .10 small, .30 medium, and .50 large (Cohen, 1992).

2.5.1.2 *Predictive Validity*

Receiver Operating Characteristic (ROC) analyses were performed for the SAVRY, PCL:YV, VRS-YV, and SAPROF-YV on binary general, violent, and nonviolent recidivism criteria, generating an Area Under the Curve (AUC) statistic, representing the extent to which test scores discriminate recidivists from non-recidivists (i.e., the probability that a randomly selected recidivist will score higher on a risk tool than a randomly selected non-recidivist). AUC statistics were calculated for the total sample, Indigenous and non-Indigenous youth, and males and females. AUC values can be interpreted as small (0.56 – 0.63), medium (0.64 – 0.70) and high (0.71 – 1.00) (Rice & Harris, 2005).

2.5.1.3 *Incremental Validity*

Cox regression survival analyses were performed, entering two or more predictor variables into the model as covariates. Predictor variable pairs for the present study included: The VRS-YV stable and dynamic scores, VRS-YV with the SAVRY, SAPROF-YV, PCL: YV, and LSI-SK, the SAVRY with the SAPROF-YV and PCL:YV, and finally the LSI-SK and the PCL: YV.

Cox regression analysis provides an odds ratio, termed the exponential beta coefficient (e^B), which is an indicator of the change in odds resulting from a unit change in the predictor. Regarding the present study, e^B magnitudes represent the proportionate increase in the hazard of a given recidivism event over time for every one-unit increase in the risk measure. Values greater than 1.0 indicate that as the predictor increases, the odds of that outcome occurring increases; values less than 1.0 indicate that as the predictor increases, the odds of the outcome occurring

decreases. For every e^B, there is a corresponding Wald statistic, which indicates whether the variable is making a significant contribution to the prediction of outcome; the larger the Wald statistic, the greater the predictive validity (Field, 2009).

Calibration between tools was also explored using three different analyses. Kaplan Meier survival analyses were conducted to examine trajectories of recidivism over time for each outcome at the different risk levels associated with a given tool. Kaplan Meier survival analysis depicts the time it takes for events (e.g., recidivism) to occur. It provides a graphical representation of the survival rate as a function of time; an offender who does not recidivate has "survived". This produces a curve, often steep at the beginning of follow-up, and leveling out over time. Significance for pairwise differences (log rank chi square) was tested between risk strata. Kaplan Meier survival analyses were completed for the sample as a whole and among ethnic and gender subgroups.

Additionally, logistic regression was conducted to estimate rates of recidivism attached to individual scores as a function of the linear relationship of risk score to outcome and the base rate of recidivism in the sample. Logistic regression predicts the probability of an outcome variable (e.g., recidivism) using known values (e.g. risk scores). Logistic regression allows for the use of a categorical outcome variable as well as the addition of multiple known values to predict the probability of the outcome. The resulting value varies between 0 and 1, with 0 meaning the outcome variable will not occur, and 1 meaning the outcome variable will occur.

Finally, observed rates of recidivism attached to a given risk category were conducted, with differences in recidivism frequencies between risk bands being tested through chi square analyses.

2.5.2 *Between Group Differences*

Multivariate analysis of variance (MANOVA) was conducted to examine independent group differences between male-female and Indigenous-non-Indigenous subgroups. In addition, standardized mean difference (Cohen's d) were computed to report group differences on risk measures in standard units, 0.20 represents a small effect, 0.50 represents a medium effect, and 0.80 represents a large effect (Cohen, 1992).

2.5.3 *Change Scores*

Paired t-tests and Cohen's d were conducted on pre-post treatment scores on the VRS-YV, with a significant difference indicating a significant change from pre-treatment score to

post-treatment score. Pearson correlations were also conducted between protective factor scores and change scores. Cox regression analyses were performed to examine the association between change scores and decreases in recidivism, controlling for VRS-YV pretreatment total score (as pre-treatment scores can constrain change).

2.5.4 *Service Engagement*

Survival and chi square analyses were conducted to compare rates of recidivism between youth who vary in level of service engagement. Baseline risk was covaried out to control for possible differences in risk level between groups. Additionally, Pearson correlations were computed between indices of treatment engagement and the SAPROF-YV and the PCL: YV total and factor scores.

3. RESULTS

3.1 Interrater Reliability

The inter-rater reliability of the forensic tools and their component/ factor scores (see Table 3.1) were evaluated using absolute agreement intraclass correlation coefficients (ICCs). As mentioned above, 27 randomly selected files were chosen for interrater reliability. Using the well-established interrater reliability magnitude criteria of Cicchetti and Sparrow (1981), the ICCs for all forensic tools were broadly "excellent" (i.e., all but one ICCs > 0.75) and significant at the $p < 0.001$ level: SAVRY total score $ICC = 0.96$; PCL: YV total score $ICC = 0.96$; VRS-YV total score $ICC = 0.97$, and SAPROF-YV total score $ICC = 0.94$. Similarly, the corresponding component/ factor scores for each tool were also significant at the $p < 0.001$ level and demonstrated excellent agreement with reliability ranging from $ICC = 0.73$ to 0.96. The ICCs for the VRS-YV total and component scores are consistent with past research (Stockdale, Olver, & Wong, 2013), as are the ICCs for the PCL: YV total and factor scores (Stockdale, Olver, & Wong, 2010), the SAVRY total and factor scores (Viljoen et al., 2018), and the SAPROF-YV (Li et al., 2019), with the current research demonstrating slightly higher ICCs overall. As the LSI-SK was not rated for the current study no ICCs were calculated for the total or component scores.

Table 3.1

Interrater Reliability Statistics for Forensic Measures Total Scores and Component/Factor Scores: Absolute Agreement Single Measure Intraclass Correlation Coefficients

Variable	Cronbach's Alpha	ICC
SAVRY		
Total	0.98	0.96
Historical	0.97	0.95
Social	0.92	0.85
Individual	0.97	0.94
Protective	0.95	0.90
PCL: YV		
Total	0.98	0.96
Interpersonal	0.93	0.86
Affective	0.91	0.84
Lifestyle	0.88	0.78
Antisocial	0.95	0.90
Other	0.92	0.85
VRS-YV		
Pre-treatment Total	0.99	0.97
Pre-treatment Stable	0.97	0.93
Pre-treatment Dynamic	0.98	0.96
SAPROF-YV		
Total	0.97	0.94
Resilience	0.91	0.83
Motivational	0.96	0.92
Relational	0.89	0.76
External	0.84	0.73

Note: all $p < .001$

3.2 Descriptive Statistics

The means and standard deviations for the forensic measures (SAVRY, PCL: YV, VRS-YV, SAPROF-YV, and LSI-SK) and their component/ factor scores for the SAVRY (historical, social, individual, and protective), PCL: YV (interpersonal, affective, lifestyle, and antisocial), VRS-YV (pre/post stable and dynamic), and SAPROF-YV (resilience, motivational, relational, and external) for the total sample are presented in Table 3.2 and are briefly summarized below.

The SAVRY total mean score fell approximately halfway between the lower (0) and upper (48) range of the tool ($M = 25.72$) and was nearly identical to the mean total score reported by Viljoen et al. ($M = 25.71$; 2018). The distribution of scores across the three component scores differed slightly, with the present study exhibiting a higher individual/clinical score and the Viljoen et al. study exhibiting a higher historical score. The protective scores were also comparable between the present study ($M = 1.29$) and Viljoen et al. ($M = 1.40$). The PCL: YV total score was slightly below the middle range ($M = 18.56$; range 0-40) but is comparable with past research for the total score (e.g. $M = 21.8$, Olver, Stockdale, & Wong, 2010). Factor scores are also comparable with Olver et al., however that study had a slightly higher lifestyle factor score. The mean VRS-YV pre-treatment score for the present study also fell in the middle range ($M = 36.78$), which was lower than previous research by Stockdale et al. ($M = 43.1$). The SAPROF-YV total mean score fell in the lower end ($M = 7.43$; range 0-32), which is consistent with the low number of protective factors found in other youth (e.g., Viljoen et al., 2018) and adult (e.g., Coupland & Olver, 2020) protective factor research, but is much lower than the mean in other work with the SAPROF-YV ($M = 13.51$). Finally, the mean LSI-SK score ($M = 3.97$) was based on the risk rating (0-5) and not the total score, but it does fall in the upper range. This seems to be much higher than the mean reported in previous research ($M = 20.34$; Luong & Wormith, 2011), which fell below the middle of the range of scores (0-45).

Table 3.2

Youth Forensic Measures and Scales: Means and Standard Deviations

Variable	Mean	SD
SAVRY		
Total	25.72	8.42
Historical	8.74	3.85
Social	6.24	2.49
Individual	10.80	3.68
Protective	1.29	1.35
PCL: YV		
Total	18.56	6.96
Interpersonal	1.63	1.78
Affective	4.79	2.26
Lifestyle	5.90	2.35
Antisocial	5.44	2.61
Other	0.81	1.14
VRS-YV		
Pre-treatment total	36.78	11.94
Post-treatment total	35.96	11.97
Pre-treatment stable	5.29	2.56
Post-treatment stable	5.48	2.54
Pre-treatment dynamic	30.67	10.08
Post-treatment dynamic	29.99	10.11
SAPROF-YV		
Total	7.43	4.73
Resilience	1.26	1.23
Motivational	2.21	2.40
Relational	1.77	1.40
External	2.17	0.97
LSI-SK		
Risk Score	3.97	1.09

3.3 Base Rates of Recidivism

Recidivism information was available for 450 of the total 451 youth in the sample. The participants were followed for a mean of 9.43 years ($SD = 1.40$), with a range of 4.16 years to 12.86 years. Over two thirds of the sample (68.5%) had at least one re-offense, with the average number of re-offenses was $M = 14.27$ ($SD = 12.59$), with 40.1% of the sample acquiring at least one new youth offense ($M = 8.45$, $SD = 7.73$), and 68% receiving at least one new adult offense ($M = 16.07$, $SD = 13.64$). Fifty-two percent of the sample reoffended violently, with the mean number of new violent offenses being $M = 3.32$ ($SD = 2.90$), 21.7% acquired a new violent offense as a youth ($M = 01.90$, $SD = 1.89$), and 47% of the sample acquired a new violent offense as an adult ($M = 2.97$, $SD = 2.35$). Finally, 67% of the sample reoffended with at least one new non-violent offense ($M = 17.81$, $SD = 14.52$), with 37.4% reoffending non-violently as a youth ($M = 7.95$, $SD = 6.89$), and 66.4% reoffending non-violently as an adult ($M = 14.27$, $SD = 12.5$). Base rates of recidivism for ethnic and gender subgroups are presented in Table 3.3. In general, Indigenous youth had higher base rates of recidivism than non-Indigenous youth and males had higher base rates of recidivism than females.

Table 3.3

General, Violent, and Non-violent Percent Recidivism by Ethnicity and Gender

	Indigenous	Non-Indigenous	ϕ	Male	Female	ϕ
General Recidivism	75.5	67.2	.08	74.5	51.8	-.21***
Youth	50.0	29.1	.17**	44.1	29.6	-.13*
Adult	75.1	67.2	.08	74.5	50.0	-.23***
Violent Recidivism	60.9	41.8	.16**	57.1	37.7	-.17***
Youth	27.3	10.9	.16*	22.6	19.4	-.03
Adult	55.4	38.8	.14*	53.2	29.8	-.21***
Non-violent Recidivism	74.7	61.2	.13*	72.9	50.9	-.21***
Youth	45.4	29.1	.14*	41.1	27.6	-.12*
Adult	74.2	59.7	.13*	72.6	50.9	-.22***

Note: *** $p < .001$, **$p < .01$, * $p <.05$

3.4 Convergent Validity of Forensic Measures (Hypothesis one)

The SAVRY, PCL: YV, VRS-YV, the SAPROF-YV total scores and component/factor scores were correlated with each other and with the LSI-SK risk level and the presence of the LSI-SK component factors to assess convergent validity of the forensic measures (Table 3.3.1). The correlations between tools designed to assess risk factors or characteristics previously demonstrated to be associated with risk (SAVRY, PCL: YV, VRS-YV and LSI-SK total and component, factor scores) were large, positively correlated, and significant. The tools/ components designed to assess protective factors (SAPROF-YV total and factor scores and SAVRY protective factor score) were also large, positively correlated, and significant. As expected, the tools designed to measure risk factors or characteristics associated with risk were large and significantly negatively correlated with the tools/ components designed to assess protective factors. The PCL: YV Interpersonal Factor score and the PCL: YV Other Factor score were the only two scores to not consistently demonstrate a significant relationship with the other total and/or factor/component scores (although they did demonstrate significant relationships with some total and component/factor scores). Most correlations were significant at the $p < .001$ level and moderate to large in magnitude per Cohen (1992); exceptions included the correlation between the PCL: YV affective facet and external score (no significant relationship), the PCL: YV affective facet score and the presence of the education, family circumstances, attitude, and antisocial pattern LSI-SK risk factors, and the VRS-YV post-treatment total score and the SAPROF external score which were significant at the $p <.05$ level.

Table 3.4

Correlation Matrix Youth Forensic Measures Total and Component/Factor Scores

	1	2	3	4	5	6	7	8	9	10	11
1. SAVRY Historical	-	.64***	.53***	-.54***	.87***	.01	.30***	.45***	.69***	-.03	.50***
2. SAVRY Social		-	.55***	-.72***	.83***	.04	.34***	.52***	.54***	-.06	.49***
3. SAVRY Individual			-	-.58***	.82***	.21**	.61***	.80***	.71***	-.08	.78***
4. SAVRY Protective				-	-.71**	-.03	-.34**	-.51**	-.53**	.07	-.48**
5. SAVRY Total					-	.11	.50***	.71***	.78***	-.07	.71***
6. PCL: YV Interpersonal						-	.43***	.24***	.18**	.23***	.58***
7. PCL: YC Affective							-	.54***	.47***	.06	.81***
8. PCL: YV Lifestyle								-	.59***	-.01	.80***
9. PCL: YV Antisocial									-	-.08	.76***
10. PCL: YV Other										-	.21**
11. PCL: YV Total											-

Table 3.4 continued

	12	13	14	15	16	17	18	19	20	21
1. SAVRY Historical	.82***	.83***	.65***	.69***	.71***	.74***	-.47***	-.54***	-.50***	-.35***
2. SAVRY Social	.66***	.70***	.69***	.75***	.73***	.77***	-.52***	-.60***	-.75***	-.46***
3. SAVRY Individual	.55***	.47***	.85***	.83***	.83***	.79***	-.62***	-.73***	-.50***	-.30***
4. SAVRY Protective	-.51***	-.52***	-.59***	-.60***	-.61***	-.61***	.56***	.72***	.71***	.36***
5. SAVRY Total	.81**	.80**	.87**	.91**	.89**	.93**	-.64**	-.74**	-.67**	-.43**
6. PCL: YV Interpersonal	.10	.04	.24***	.21*	.22**	.18	-.14*	-.15*	-.04	.05
7. PCL: YC Affective	.38***	.30**	.60***	.55***	.57***	.52***	-.44***	-.42***	-.30***	-.10
8. PCL: YV Lifestyle	.49***	.42***	.73***	.74***	.71***	.71***	-.56***	-.64***	-.45***	-.27***
9. PCL: YV Antisocial	.75***	.70***	.80***	.78***	.82***	.80***	-.50***	-.62***	-.48***	-.25***
10. PCL: YV Other	.003	-.21	-.07	-.28**	-.05	-.27*	-.02	-.16*	0.02	0.15*
11. PCL: YV Total	.59***	.49***	.79***	.75***	.78***	.73***	-.56***	-.60***	-.44***	-.18**
12. VRS-YV Stable (Pre)	-	.99***	.71***	.69***	.80***	.80***	-.45***	-.52***	-.58***	-.37***
13. VRS-YV Stable (Post)		-	.69***	.70***	.79***	.80***	-.48***	-.48***	-.62***	-.39***
14. VRS-YV Dynamic (Pre)			-	.95***	.99***	.94***	-.64***	-.69***	-.61***	-.32***
15. VRS-YV Dynamic (Post)				-	.94***	.99***	-.64***	-.70***	-.60***	-.30**
16. VRS-YV Total (Pre)					-	.96***	-.64***	-.68***	-.64***	-.35***
17. VRS-YV Total (Post)						-	-.64***	-.68***	-.64***	-.33*
18. SAPROF-YV Resilience							-	.53***	.51***	.25***
19. SAPROF-YV Motivational								-	.55***	.37***
20. SAPROF-YV Relational									-	.44***

Table 3.4 continued

	22	23	24	25	26	27	28	29	30	31
1. SAVRY Historical	-.62***	.60***	.49***	.41***	.45***	.36***	.48***	.37***	.35***	-.50***
2. SAVRY Social	-.76***	.69***	.40***	.47***	.53***	.46***	.56***	.36***	.43***	.49***
3. SAVRY Individual	-.74***	.66***	.37***	.46***	.34***	.43***	.47***	.45***	.52***	.56***
4. SAVRY Protective	.80***	-.64***	-.35***	-.48***	-.53***	-.60***	-.57***	-.33***	-.41***	-.46***
5. SAVRY Total	-.83***	.77***	.50***	.53***	.52***	.50***	.58***	.48***	.51***	.60***
6. PCL: YV Interpersonal	-.11	.04	.05	.10	-.04	.13	-.09	.05	-.04	.12
7. PCL: YV Affective	-.43***	.29***	.16*	.14*	.19**	.33***	.16*	.37***	.17*	.35***
8. PCL: YV Lifestyle	-.66***	.59***	.33***	.47***	.30***	.39***	.43***	.46***	.44***	.51***
9. PCL: YV Antisocial	-.64***	.62***	.51***	.37***	.42***	.42***	.44***	.39***	.45***	.55***
10. PCL: YV Other	0.11	-.16*	-.11	-.05	-.05	-0.7	-.16*	-.11	-.20**	-.17*
11. PCL: YV Total	-.62***	.51***	.35***	.36***	.31***	.42***	.31***	.42***	.33***	.50***
12. VRS-YV Stable (Pre)	-.63***	.57***	.51***	.33***	.50***	.37***	.42***	.37***	.35***	.47***
13. VRS-YV Stable (Post)	-.64***	.62***	.53***	.38***	.55***	.36**	.49***	.48***	.34**	.56***
14. VRS-YV Dynamic (Pre)	-.76***	.70***	.47***	.46***	.40***	.44***	.49***	.42***	.50***	.57***
15. VRS-YV Dynamic (Post)	-.77***	.76***	.50***	.59***	.44***	.38***	.64***	.56***	.58***	.65***
16. VRS-YV Total (Pre)	-.77***	.71***	.50***	.45***	.45***	.45***	.50***	.43***	.49***	.58***
17. VRS-YV Total (Post)	-.79***	.77***	.53***	.58***	.48***	.39***	.63***	.56***	.55***	.66***
18. SAPROF-YV Resilience	.74***	-.46***	-.24***	-.29***	-.29***	-.38***	-.37***	-.29***	-.32***	-.41***
19. SAPROF-YV Motivational	.88***	-.72***	-.41***	-.56***	-.43***	-.61***	-.56***	-.42***	-.49***	-.56***
20. SAPROF-YV Relational	.80***	-.57***	-.37***	-.39***	-.52***	-.44***	-.42***	-.27***	-.38***	-.41***

Table 3.4 continued

	22	23	24	25	26	27	28	29	30	31
21. SAPROF External	.59***	-.36***	-.31***	-.32***	-.27***	-.24***	-.25***	-.20**	-.28***	-.26***
22. SAPROF Total	-	-.73***	-.45***	-.54***	-.50***	-.59***	-.56***	-.41***	-.50***	-.56***
23. LSI-SK Criminal History		-	.35***	.31***	.33***	.38***	.37***	.34***	.50***	.61***
24. LSI-SK Education			-	.33***	.41***	.38***	.32***	.34***	.40***	.62***
25. LSI-SK FC				-	.34***	.33***	.23***	.27***	.32***	.48***
26. LSI-SK Leisure					-	.41***	.32***	.39***	.40***	.62***
27. LSI-SK Companions						-	.37***	.44***	.50***	.66***
28. LSI-SK Attitude							-	.25***	.48***	.52***
29. LSI-SK Substance Use								-	.40***	.66***
30. LSI-SK Antisocial Pattern									-	.68***
31. LSI-SK Total										-

Note: *** $p < .001$, ** $p < .01$, * $p < .05$; FC = Family Circumstances

3.5 Predictive Validity of Forensic Measures (Hypothesis two)

3.5.1 *Total sample area under the curve fixed follow-ups*

The predictive validity of the forensic measures and component/ factor scores were examined for violent, non-violent, and any recidivism for fixed follow-up periods (three and five years; see Table 3.4.1). Recidivism was binary coded (i.e., yes/no) for each category. Recidivism was defined as any new conviction following the first release into the community after the index offense. The average follow-up time was 9.43 years. Predictive validity was examined using area under the curve (AUC) values. AUC values are interpreted as follows: small (0.56 – 0.63), medium (0.64 – 0.70) and large (0.71 – 1.00) effect (Rice & Harris, 2005).

The measures, components, or factors that were found to significantly predict three-year violent recidivism at the $p < .05$ level were: the VRS-YV total post-treatment (medium effect), and the SAPROF-YV Resilience (small effect), and relational score (small effect). Those that were found to predict at a greater degree, at the $p < .01$ level, included: the VRS-YV stable (small effect), and dynamic post-treatment (medium effect), the SAVRY historical, social/contextual, and protective scores (small effects), and the PCL: YV total and lifestyle scores (small effects). Finally, the measures, components, or factors scores that were found to be significantly predictive to the best degree at the $p < .001$ level for three-year violent recidivism included: the VRS-YV dynamic pre-treatment and total pre-treatment scores (medium effects), the SAVRY individual/ clinical and total scores (medium effects), the PCL:YV antisocial score (medium effect), the LSI-SK risk category (small effect), and the SAPROF-YV motivational and total scores (medium effects). The predictive accuracy of the measures, components, or factors scores for violent recidivism evidenced a similar pattern for the five-year fixed follow-up, with the VRS-YV stable and SAVRY protective scores decreasing in significance level to $p < .05$ (small effects), the SAPROF: Resilience score increasing to $p < .01$ significance (small effect) and the PCL:YV lifestyle and total scores increasing to $p < .001$ significance (medium effect). The PCL: YV interpersonal (null effect), affective (small effect), and the SAPROF-YV external (null effect) were not significant predictors of violent recidivism at the three- or five-year fixed follow-up period.

The measures, components or factors scores that were found to predict three-year non-violent recidivism at the $p < .05$ level included: SAPROF-YV resilience and external scores (small effect). The VRS-YV stable (small effect), pre-treatment dynamic and total scores

(medium effects) and SAPROF-YV relational were all predictive of three-year non-violent recidivism at the $p <.01$ level. Finally, the VRS-YV pre-treatment dynamic and total scores (medium effects), the SAVRY historical, social/contextual, total, protective (medium effects), and individual/ clinical (large effect) scores, the PCL: YV lifestyle, antisocial, and total scores (medium effects), the LSI-SK risk category (medium effect), and the SAPROF-YV motivational and total scores (medium effects) were all significant predictors of three-year non-violent recidivism at the $p <.001$ level. The measures, components and factors scores again evidenced a similar pattern at the five-year fixed follow-up period with the VRS-YV post-treatment dynamic and total scores now predictive at the $p < .05$ level (medium effects), and the SAVRY protective score now predictive at the $p <.01$ level (small effect). The PCL: YV interpersonal (null effect) and affective (small effect) scores evidenced no significant prediction at the three- or five-year follow-up, and although the SAPROF-YV resilience score was significant at the three-year follow-up, it was no longer significant at the five-year follow-up (effect remained small).

Finally, for any recidivism the measures, components or factors scores that were predictive at the $p < .05$ level included: the VRS-YV total post-treatment score (medium effect), the PCL: YV affective score (small effect), and the SAPROF-YV resilience and external scores (small effects). The VRS-YV stable score (small effect), and dynamic post-treatment score (medium effect), and the SAPROF-YV relational score (small effect) were significant at the $p < .01$ level. Finally, the VRS-YV pre-treatment dynamic and total scores (medium effect), the SAVRY historical, social/contextual, total, protective (medium effects), and individual/ clinical (large effect) scores, the PCL: YV lifestyle, antisocial, and total scores (medium effects), the LSI-SK risk category (medium effect), and the SAPROF-YV motivational and total scores were predictive of three-year any recidivism at the $p < .001$ level. The only changes for the five-year follow-up included the SAVRY protective score decreasing to $p < .01$ significance (small effect), and the PCL: YV affective score was no longer significant (small effect). The PCL: YV interpersonal score (null effect) evidenced no significant prediction at the three- or five-year follow-up.

In general, the forensic measures and the component/ factor scores demonstrated good predictive accuracy for three and five year violent, non-violent, and any recidivism. All measures and the majority of component/ factor scores were predictive across the two fixed follow-up periods and different types of recidivism were significantly predictive at the $p < .05$ level (or

better), with very few component/ factor scores demonstrating no significantly predictive accuracy.

3.5.2 *Total sample area under the curve youth, adult, and any recidivism*

The predictive validity of the forensic measures total and component/ factor scores was also examined for youth, adult, and any age for violent, non-violent, and any recidivism (Table 3.). Correlations between total and component/ factor scores with the total number of convictions in a given area are also presented.

Most of the forensic measures and component/ factor scores were predictive for youth violent recidivism at the $p < .01$ level, including the VRS-YV dynamic pre-treatment (medium effect), dynamic post-treatment (large effect), total pre-treatment (small effect), and total post-treatment (large effect) scores, the SAVRY historical, individual/ clinical, and total scores (medium effect), PCL: YV antisocial score (medium effect), and the SAPROF-YV total score (small effect). The SAVRY social/contextual score (small effect), the PCL: YV lifestyle and total scores (small effects), and the SAPROF-YV motivational score were also predictive of youth violent recidivism at the $p < .05$ level. No measures or component/ factor scores were predictive at the $p < .001$ level. The VRS-YV stable score (small effect), SAVRY protective score (small effect), PCL: YV interpersonal (small effect) and affective (null effect) scores, LSI-SK risk category (small effect), SAPROF: YV resilience, relational (small effects) and external (null effect) scores were not significant predictors of youth violent recidivism.

Most of the forensic measures and component/ factor scores were predictive of adult violent recidivism at the $p < .001$ including the VRS-YV stable, dynamic pre-treatment, and total pre-treatment scores (medium effects), the SAVRY historical, social/contextual, individual/ clinical and total scores (medium effects), the PCL: YV lifestyle, antisocial, and total scores (medium effects), and the SAPROF-YV motivational and total scores (medium effects). The LSI-SK (small effect) and the SAPROF-YV resilience and relational scores (small effects) were predictive of adult violent recidivism at the $p < .01$ level. The dynamic post-treatment and total post-treatment scores (medium effects) and the SAVRY protective score (small effect) were also predictive of adult violent recidivism at the $p < .05$ level. As with youth violent recidivism, the PCL: YV interpersonal (null effect) and affective (small effect) scores and the SAPROF-YV external score (null effect) were not significantly predictive of adult violent recidivism.

The significance level of the predictive accuracy of the forensic measures and the component/ factor scores was mixed for any age violent recidivism. The VRS-YV total post-treatment score (medium effect) was predictive of any age violent recidivism at the $p < .05$ level. The VRS-YV stable (small effect) and dynamic post-treatment (medium effect) scores, the SAVRY protective score (small effect), the LSI-SK risk category (small effect), and the SAPROF-YV resilience and relational scores (small effects) were predictive at the $p < .01$ level. The VRS-YV dynamic pre-treatment and total pre-treatment scores (medium effects), the SAVRY historical, individual/ clinical, total (medium effects), and the social/contextual (small effects) scores, the PCL: YV lifestyle, antisocial, and total scores (medium effects), and the SAPROF-YV motivational and total scores (medium effects) were all significant at the $p < .001$ level. The PCL: YV interpersonal and effective scores (null effect), as well as the SAPROF-YV external score (null effect) were not significant predictors of violent recidivism at any age.

Most of the forensic measures and component/ factor scores were predictive for youth non-violent recidivism at either the $p < .01$ level or the $p < .001$ level, with the exception of the PCL: YV affective score (small effect) and the SAPROF-YV external score (small effect) which were significant predictors of youth non-violent recidivism at the $p < .05$ level, and the PCL: YV interpersonal score (null effect) which was not significantly predictive. Adult non-violent recidivism evidenced a similar pattern, with most measures and component/ factor scores predictive at either the $p < .01$ or $p < .001$ level, with the exception of the SAVRY protective (small effect) and the SAPROF-YV external score (small effect) which were predictive at the $p < .05$ level and the PCL: YV interpersonal and affective scores (null effects) and the SAPROF-YV resilience score (small effect) which were not significant predictors of adult non-violent recidivism. The pattern of prediction of non-violent recidivism continued for any age with all the forensic measures and component/ factor scores significant predictors of non-violent recidivism at either the $p < .01$ or $p < .001$ level, with the exception of the SAPROF-YV relational score (small effect) which was predictive at the $p < .05$ level. The PCL: YV interpersonal and affective scores (null effect) and the SAPROF-YV resilience score (small effect) were not predictive of non-violent recidivism.

Finally, in regard to any youth recidivism, almost all forensic measures and most component/ factor scores were significant at the $p < .001$ level, with the exception of the SAPROF-YV external score (small effect), which was significant at the $p < .05$ level, the

SAVRY protective score (small effect), PCL: YV affective score (small effect), the LSI-SK risk category (small effect), SAPROF-YV resilience score (small effect), which were significant at the *p* < .01 level, and the PCL: YV interpersonal score (null effect) which was not a significant predictor of any youth recidivism.

In regard to any adult recidivism most measures and factor/ component scores were again significant predictors at the *p* < .001 level, with the exception of the VRS-YV dynamic post-treatment and total post-treatment scores (medium effects), the SAVRY protective score (small effect), and the SAPROF-YV relational score (small effect), which were significant at the *p* < .05 level. Moreover, the VRS-YV stable score (small effect), the SAVRY social/contextual score (small effect), and the LSI-SK risk category (small effect), were predictive at the *p* < .01 level. The PCL: YV interpersonal (small effect) and affective (null effect) scores, and the SAPROF-YV resilience (null effect) and external (small effect) scores were not significant predictors of any adult recidivism. The pattern of prediction was nearly identical for any age, with the only difference being the effect level of some of the scores (e.g., the non-significantly predictive variables all had small effects for any age recidivism).

Similar to the predictive accuracy of the fixed-follow ups, most of the forensic measures and component/ factor scores were again good predictors of youth, adult, and any age recidivism for violent, non-violent, and any recidivism. Again, all forensic measures and most component/ factor scores were significant predictors of recidivism at a minimum of *p* < .05 level.

Table 3.5

Predictive Validity: Forensic Risk Measures, Component, and Factor score AUCs, for Fixed Follow-up Recidivism

Measure	Violent recidivism 3-year AUC	Violent recidivism 3-year 95%CI	Violent recidivism 5-year AUC	Violent recidivism 5-year 95%CI	Nonviolent recidivism 3-year AUC	Nonviolent recidivism 3-year 95%CI	Nonviolent recidivism 5-year AUC	Nonviolent recidivism 5-year 95%CI	Any recidivism 3-year AUC	Any recidivism 3-year 95%CI	Any recidivism 5-year AUC	Any recidivism 5-year 95%CI
VRS-YV												
Stable	.60**	.53, .68	.58*	.52, .66	.62**	.55, .69	.62**	.55, .69	.62**	.55, .69	.62**	.55, .70
Dynamic pre	.67***	.60, .74	.68***	.61, .74	.68***	.62, .75	.68***	.61, .75	.69***	.62, .75	.69***	.62, .76
Dynamic post	.67**	.59, .73	.67**	.56, .78	.68**	.57, .80	.65*	.53, .77	.70**	.59, .81	.68**	.56, .80
Total pre	.66***	.59, .73	.66***	.60, .73	.67***	.60, .74	.67***	.60, .74	.68***	.61, .74	.68***	.62, .76
Total post	.66*	.53, .78	.65*	.53, .76	.67**	.56, .79	.64*	.52, .77	.69*	.58, .80	.67*	.55, .79
SAVRY												
Historical	.62**	.55, .70	.63**	.66, .70	.65***	.58, .71	.65***	.58, .72	.64***	.57, .71	.64***	.57, .72
Social/contextual	.63**	.56, .70	.63**	.55, .69	.65***	.59, .72	.64***	.57, .71	.65***	.59, .72	.65***	.58, .72
Individual/clinical	.68***	.61, .75	.71***	.64, .77	.71***	.65, .78	.70***	.64, .77	.72***	.66, .78	.72***	.65, .78
Total	.67***	.60, .74	.68***	.61, .74	.70***	.63, .76	.69***	.62, .76	.70***	.64, .77	.70***	.63, .76
Protective	.60**	.53, .68	.58*	.51, .66	.64***	.57, .71	.63**	.56, .70	.64***	.57, .71	.63**	.55, .70
PCL: YV												
Interpersonal	.50	.43, .58	.53	.46, .60	.55	.48, .62	.53	.46, .60	.57	.49, .64	.53	.46, .61
Affective	.57	.49, .64	.57	.50, .64	.56	.49, .63	.54	.47, .61	.58*	.51, .65	.55	.48, .63
Lifestyle	.62**	.55, .69	.66***	.60, .73	.69***	.63, .76	.68***	.61, .75	.69***	.63, .76	.70***	.63, .76
Antisocial	.67***	.61, .74	.67***	.61, .74	.68***	.61, .75	.68***	.61, .75	.69***	.62, .75	.68***	.62, .75
Total	.62**	.55, .69	.65***	.58, .72	.66***	.59, .73	.64***	.57, .71	.67***	.61, .74	.65***	.58, .73
LSI-SK												
Risk category	.63***	.56, .70	.63***	.57, .70	.66***	.60, .73	.64***	.58, .71	.67***	.61, .73	.66***	.59, .72
SAPROF-YV												
Resilience	.58*	.51, .66	.60**	.53, .67	.59*	.52, .66	.57	.50, .65	.59*	.52, .66	.58*	.51, .65
Motivational	.65***	.58, .72	.65***	.58, .72	.70***	.64, .77	.68***	.61, .75	.70***	.64, .77	.68***	.61, .75
Relational	.59*	.52, .66	.59*	.52, .66	.62**	.55, .69	.62**	.55, .69	.62**	.55, .69	.62**	.55, .69
External	.55	.47, .62	.54	.46, .61	.59*	.52, .66	.58*	.51, .65	.59*	.51, .66	.58*	.51, .65
Total	.64***	.57, .71	.64***	.57, .71	.68***	.62, .75	.67***	.60, .73	.68***	.62, .75	.67***	.60, .74

Note: *** $p < .001$, ** $p < .01$, p * $<.05$

Table 3.6

Predictive Validity: Forensic Risk Measures, Component and Factor score AUCs for Youth, Adult, and Total Recidivism

Measure	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	*r*	AUC	95%CI	*r*	AUC	95%CI
				Violent recidivism					
VRS-YV									
Stable	.22**	.59	.49, .69	.25***	.64***	.57, .71	.28***	.62**	.56, .69
Dynamic pre	.22**	.64**	.54, .73	.29***	.68***	.61, .75	.31***	.67***	.60, .73
Dynamic post	.36**	.80**	.66, .94	.27*	.65*	.54, .77	.34**	.67**	.55, .78
Total pre	.23**	.63**	.53, .72	.28***	.68***	.61, .74	.31**	.66***	.60, .73
Total post	.35**	.77**	.62, .92	.26*	.65*	.53, .76	.32**	.65*	.53, .77
SAVRY									
Historical.	.27***	.65**	.56, .73	.23***	.64***	.57, .71	.28***	.65***	.59, .72
Social/contextual	.15*	.61*	.51, .69	.19**	.64***	.57, .71	.21**	.63***	.56, .70
Individual/clinical	.20**	.65**	.56, .74	.31***	.70***	.64, .77	.33***	.70***	.64, .77
Total	.23**	.66**	.57, .75	.28***	.69***	.62, .75	.31***	.70***	.63, .76
Protective	-.10	.59	.50, .68	-.11	.59*	.52, .66	-.13*	.60**	.53, .67
PCL: YV									
Interpersonal	.02	.49	.40, .58	-.09	.53	.46, .60	-.07	.53	.46, .60
Affective	.15*	.59	.50, .69	.06	.56	.49, .63	.10	.55	.48, .63
Lifestyle	.15*	.61*	.52, .70	.18**	.66***	.59, .73	.20**	.67***	.60, .73
Antisocial	.24***	.64**	.55, .74	.30***	.69***	.63, .76	.33***	.70***	.63, .76
Total	.20**	.61*	.51, .70	.17**	.66***	.59, .73	.20**	.65***	.59, .72
LSI-SK									
Risk category	.11	.58	.50, .67	.26***	.61**	.54, .68	.24***	.60**	.54, .67
SAPROF-YV									
Resilience	-.15*	.58	.49, .67	-.17**	.61**	.54, .68	-.20**	.60**	.53, .68
Motivational	-.13	.61*	.52, .70	-.26***	.67***	.60, .74	-.26***	.68***	.61, .75
Relational	-.13	.59	.51, .68	-.14*	.61**	.54, .68	-.17**	.62**	.55, .69
External	-.09	.54	.45, .63	-.11	.55	.48, .62	-.12	.54	.47, .62
Total	-.17*	.63**	.54, .71	-.25***	.67***	.60, .74	-.26***	.68***	.61, .74
				Nonviolent recidivism					
VRS-YV									
Stable	.22**	.62**	.55, .70	.21**	.64***	.57, .72	.24***	.64***	.57, .71
Dynamic pre	-.17*	.66***	.59, .74	.22***	.67***	.60, .74	.23***	.67***	.60, .74
Dynamic post	.26*	.72**	.60, .85	.24*	.70**	.58, .82	.30**	.70**	.58, .82
Total pre	.19**	.66***	.58, .73	.21**	.67***	.60, .74	.23***	.67***	.60, .74
Total post	.26*	.72**	.59, .84	.23*	.69**	.57, .82	.29**	.70**	.57, .82
SAVRY									
Historical.	.28***	.66***	.58, .73	.28***	.66***	.59, .74	.32***	.65***	.58, .73
Social/contextual	.22**	.66***	.58, .73	.26***	.64***	.57, .71	.29***	.64***	.57, .71
Individual/clinical	.21**	.70***	.63, .77	.27***	.70***	.63, .77	.30***	.70***	.64, .77
Total	.28***	.71***	.64, .78	.32***	.70***	.63, .77	.36***	.69***	.62, .76
Protective	-.23**	.64**	.56, .71	-.22***	.59*	.52, .67	-.26***	.61**	.53, .68

(Continued)	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	*r*	AUC	95%CI	*r*	AUC	95%CI
PCL: YV									
Interpersonal	-.07	.50	.42, .58	-.03	.55	.47, .62	-.05	.54	.46, .62
Affective	.08	.59*	.52, .67	-.04	.54	.46, .61	-.02	.55	.47, .62
Lifestyle	.16*	.71***	.64, .78	.23***	.68***	.60, .75	.25***	.68***	.61, .76
Antisocial	.23**	.65***	.57, .72	.25***	.69***	.62, .76	.28***	.68***	.61, .75
Total	.13	.64***	.57, .72	.14*	.66***	.58, .73	.15*	.65***	.58, .73
LSI-SK									
Risk category	.14*	.61**	.55, .69	.30***	.63***	.56, .70	.29***	.64***	.57, .71
SAPROF-YV									
Resilience	-.15*	.62**	.54, .69	-.14*	.56	.48, .64	-.17**	.56	.49, .64
Motivational	-.21**	.69***	.62, .76	-.28***	.68***	.61, .75	-.31***	.69***	.61, .76
Relational	-.21**	.65***	.57, .72	-.17**	.60**	.53, .68	-.21**	.61**	.53, .68
External	-.15*	.60*	.52, .67	-.07	.58*	.50, .65	-.11	.58*	.50, .65
Total	-.25***	.71***	.64, .78	-.25***	.66***	.59, .74	-.29***	.67***	.59, .74

	Any recidivism								
VRS-YV									
Stable	.24***	.65***	.58, .72	.22***	.63**	.55, .70	.25***	.63**	.56, .71
Dynamic pre	.20**	.67***	.60, .74	.24***	.66***	.59, .73	.25***	.66***	.59, .74
Dynamic post	.29*	.77***	.65, .88	.24*	.68*	.55, .80	.30**	.68*	.55, .81
Total pre	.21**	.67***	.60, .74	.23***	.66***	.58, .73	.25***	.66***	.59, .73
Total post	.29*	.76***	.64, .88	.22*	.67*	.54, .80	.29**	.68*	.54, .81
SAVRY									
Historical	.31***	.67***	.60, .75	.28***	.64***	.56, .72	.33***	.64**	.56, .71
Social/contextual	.23**	.65***	.58, .73	.26***	.62**	.55, .70	.28***	.63**	.56, .70
Individual/clinical	.22**	.71***	.64, .78	.28***	.69***	.62, .76	.31***	.70***	.63, .77
Total	.30***	.72***	.65, .79	.32***	.68***	.61, .75	.36***	.68***	.61, .75
Protective	-.22**	.63**	.56, .71	-.21**	.59*	.51, .67	-.25***	.59*	.52, .67
PCL: YV									
Interpersonal	-.06	.52	.45, .60	-.04	.56	.49, .64	-.06	.56	.49, .64
Affective	.09	.61**	.53, .69	-.04	.55	.47, .63	.00	.56	.48, .64
Lifestyle	.17*	.72***	.65, .78	.22**	.68***	.61, .76	.24***	.69***	.61, .76
Antisocial	.25***	.67***	.59, .74	.27***	.68***	.61, .75	.30***	.68***	.61, .75
Total	.16*	.67***	.59, .74	.14*	.66***	.59, .73	.16*	.66***	.59, .73
LSI-SK									
Risk category	.15*	.63**	.56, .70	.29***	.62**	.54, .69	.30***	.62**	.55, .70
SAPROF-YV									
Resilience	-.16*	.63**	.56, .71	-.14*	.55	.47, .63	-.17**	.56	.48, .64
Motivational	-.21**	.69***	.62, .76	-.29***	.67***	.60, .75	-.32***	.68***	.61, .75
Relational	-.21**	.65***	.58, .73	-.16*	.60*	.52, .68	-.20**	.60*	.53, .68
External	-.15*	.59*	.51, .67	-.06	.57	.49, .65	-.10	.57	.49, .65
Total	-.25***	.71***	.64, .78	-.25***	.66***	.58, .73	-.30***	.66***	.59, .73

Note: *** *p* < .001, *p* ** < .01, *p* * < .05

3.6 Predictive Accuracy for Ethnic and Gender Subgroups (Hypothesis three)

3.6.1 *Indigenous/Non-Indigenous Comparisons*

The predictive accuracy of the forensic risk measures and component/ factor scores was also examined among the ethnic subgroup, including the three- and five-year predictive accuracy for violent, non-violent, and any recidivism for fixed period follow-ups for Indigenous (Table 3.7) and non-Indigenous (Table 3.9), and the youth, adult, and total recidivism for violent, non-violent, and any recidivism for Indigenous (Table 3.8) and non-Indigenous (Table 3.10) youth.

In regard to violent recidivism, predictive accuracy for the fixed three-year follow-up was generally higher for Indigenous youth than non-Indigenous youth, with the VRS-YV post-treatment dynamic score, PCL: YV total score, LSI-SK risk category, and SAPROF-YV motivational score demonstrating significant prediction at the $p < .05$ level, the VRS-YV pre-treatment dynamic and total scores, the SAVRY individual/ clinical and total scores, and the SAPROF-YV total score significant at the $p < .01$ level, and the PCL: YV antisocial score predictive at the $p < .001$ level. In comparison, for non-Indigenous individuals only the PCL: YV lifestyle score and the LSI-SK risk category were predictive of three-year violent recidivism at the $p < .05$ level; all other measures and component/ factor scores were not significant. However, although the values were not significant many of the AUC values were in the small-medium effect range, and thus the lack of significance is likely partially explained by the lack of power given n for the non-Indigenous group (with measure scores) was 55.

The five-year fixed follow-up for violent recidivism evidenced a similar trend for Indigenous youth, with many of the variables significant at the $p < .05$ level including the VRS-YV dynamic post-treatment and total pre-treatment score, PCL: YV lifestyle score, LSI-SK risk category, and the SAPROF-YV resilience score. Many scores were also significant at the $p < .01$ level including the VRS-YV dynamic pre-treatment score, SAVRY total score, PCL: YV antisocial and total scores, and the SAPROF-YV motivational and total scores. The SAVRY individual/ clinical score was also significant at the $p < .001$ level. The predictive accuracy for the five-year fixed follow-up for non-Indigenous youth fared better than the three year, with many scores significant at the $p < .05$ level (VRS-YV dynamic post-treatment and total pre-treatment scores, the SAVRY total score, the PCL: YV total score, and the SAPROF-YV motivational and total scores) and at the $p < .01$ level (VRS-YV dynamic pre-treatment score, SAVRY individual/ clinical score, PCL: YV lifestyle score, and LSI-SK risk category). Of note,

many of the AUC values for the Indigenous group were in the small-medium size, while the AUC values for the non-Indigenous group were in the medium-large range (although sometimes not significant).

Despite evidencing fairly good predictive accuracy for youth violent recidivism on the total sample, both the Indigenous and non-Indigenous subgroups had limited scores that were significant. For Indigenous youth, the SAVRY individual/ clinical score and the PCL: YV antisocial score were significant at the $p < .05$ level, while the VRS-YV dynamic and total post-treatment scores were significant at the $p < .01$ level. No scores were significant predictors of youth violent recidivism for the non-Indigenous group. Both groups showed improvement for adult and total recidivism, with the Indigenous group demonstrating significant predictive accuracy at the $p < .05$ level for adult violent recidivism for the VRS-YV stable score and the SAVRY historical and protective scores. The VRS-YV dynamic and total pre-treatment scores, SAVRY social/contextual score, PCL: YV total score, LSI-SK risk category, and the SAPROF-YV relational score were significant at the $p < .01$ level and the SAVRY individual/ clinical and total scores, PCL: YV antisocial score, and the SAPROF-YV motivational and total scores were significant at the $p < .001$ level. For non-Indigenous youth, the VRS-YV dynamic and total pre-treatment scores, the SAVRY individual/clinical and total scores, and the PCL: YV antisocial and total score were significant predictors of adult violent recidivism at the $p < .05$ level and the PCL: YV lifestyle score was significant at the $p < .001$ level. Both groups evidenced similar patterns to adult recidivism for total recidivism. AUC values again mainly ranged from small-medium for Indigenous youth and medium-large for non-Indigenous.

With regard to non-violent recidivism, the non-Indigenous group had more significant predictive scores for both the three- and five-year fixed follow-up. The non-Indigenous group had the following scores significant at the $p < .01$ level for the three-year fixed follow-up: the VRS-YV pre-treatment dynamic score, the SAVRY total score, and the PCL: YV antisocial and total scores. The SAVRY individual/ clinical score, PCL: YV lifestyle score, LSI-SK risk category, and SAPROF-YV motivational and total scores were also significant at the $p < .01$ level. While the non-Indigenous group had the VRS-YV stable, dynamic and total post-treatment scores, PCL: YV affective score, and SAPROF-YV external score significant at the $p < .05$ level, the SAVRY historical, PCL: YV lifestyle and antisocial scores, LSI-SK risk category, and the SAPROF-YV relational significant at the $p < .01$ level, and the VRS-YV dynamic and

total pre-treatment scores, SAVRY social/contextual, individual/ clinical, total, and protective scores, and SAPROF-YV motivational and total scores significant at the $p < .001$ level. The Indigenous group added some significant predictors for the five-year fixed follow-up, while the non-Indigenous group lost some. Youth, adult, and total recidivism prediction was similar across the two groups.

      Finally, for any recidivism the two groups evidenced similar patterns for the three- and five-year fixed follow-ups, with most of the measures and component/ factor scores significant at either the $p < .05$ or $p < .01$ level (the non-Indigenous group had some scores significant at the $p < .001$ level). Consistent with the violent and non-violent AUC values, the Indigenous recidivism values continued to be small-medium, and the non-Indigenous AUC values continued to be medium-large. The pattern of predictions for any recidivism was also similar across youth, adult, and total recidivism.

Table 3.7

Indigenous Youth Predictive Validity: Forensic Risk Measures, Component, and Factor AUCs for Fixed Follow-up Recidivism

Measure	Violent recidivism				Nonviolent recidivism				Any recidivism			
	3-year		5-year		3-year		5-year		3-year		5-year	
	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI
VRS-YV												
Stable	.58	.49, .67	.54	.45, .63	.55	.46, .64	.57	.48, .66	.57	.48, .65	.58	.48, .67
Dynamic pre	.64**	.56, .73	.63**	.55, .72	.60*	.51, .69	.60*	.51, .70	.62*	.53, .70	.62*	.53, .71
Dynamic post	.66*	.52, .81	.65*	.52, .79	.60	.46, .75	.57	.42, .72	.66*	.52, .80	.63	.48, .78
Total pre	.64**	.55, .72	.61*	.53, .70	.59	.50, .68	.59*	.50, .69	.61*	.52, .69	.61*	.52, .71
Total post	.65	.50, .80	.62	.48, .76	.59	.44, .73	.57	.41, .72	.64	.49, .78	.62	.47, .78
SAVRY												
Historical	.56	.48, .65	.55	.47, .64	.56	.47, .65	.57	.47, .67	.56	.47, .65	.57	.47, .67
Social/contextual	.58	.49, .66	.56	.48, .65	.56	.47, .65	.57	.47, .66	.57	.48, .65	.57	.48, .67
Individual/clinical	.65**	.56, .73	.68***	.60, .76	.64**	.56, .72	.64**	.55, .73	.66**	.58, .74	.66**	.58, .75
Total	.62**	.53, .71	.62**	.53, .70	.61*	.52, .70	.61*	.52, .70	.62*	.53, .71	.62*	.52, .71
Protective	.58	.50, .67	.57	.48, .65	.58	.49, .67	.59*	.50, .68	.58	.49, .67	.59	.50, .68
PCL: YV												
Interpersonal	.52	.43, .61	.54	.45, .62	.54	.45, .63	.53	.44, .62	.56	.48, .65	.55	.46, .64
Affective	.56	.47, .65	.56	.48, .65	.51	.42, .60	.48	.39, .58	.53	.44, .62	.51	.41, .60
Lifestyle	.55	.46, .64	.60*	.51, .69	.63**	.54, .71	.61*	.52, .71	.63**	.55, .72	.63**	.54, .72
Antisocial	.67***	.58, .75	.64**	.56, .73	.61*	.52, .70	.63**	.54, .72	.63**	.54, .71	.64**	.55, .73
Total	.60*	.52, .69	.63**	.55, .72	.61*	.52, .69	.60*	.50, .69	.63	.55, .72	.62*	.52, .71
LSI-SK												
Risk category	.60*	.52, .67	.59*	.51, .67	.62**	.54, .70	.60*	.51, .68	.63**	.56, .72	.62**	.54, .71
SAPROF-YV												
Resilience	.57	.48, .66	.59*	.51, .68	.57	.48, .66	.56	.47, .65	.57	.49, .66	.57	.48, .66
Motivational	.62*	.53, .70	.62**	.54, .71	.65**	.57, .74	.64**	.56, .73	.66**	.57, .74	.66**	.57, .75
Relational	.58	.49, .66	.58	.50, .67	.58	.49, .67	.61*	.52, .70	.59	.50, .68	.61*	.52, .70
External	.52	.43, .61	.49	.40, .57	.54	.46, .63	.56	.47, .65	.55	.46, .64	.56	.47, .66
Total	.62**	.54, .71	.62**	.53, .70	.64**	.55, .72	.64**	.56, .73	.65**	.56, .73	.65**	.57, .74

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Table 3.8

Indigenous Youth Predictive Validity: Forensic Risk Measures, Component and Factor Score

AUCs for Youth, Adult, and Total Recidivism

Measure	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	r	AUC	95%CI	r	AUC	95%CI
	Violent recidivism								
VRS-YV									
Stable	.21*	.57	.46, .69	.18*	.61*	.53, .70	.22**	.59*	.51, .68
Dynamic pre	.17*	.59	.48, .70	.26**	.65**	.57, .74	.27***	.63**	.55, .72
Dynamic post	.41**	.78**	.61, .94	.19	.64	.50, .78	.29*	.64	.50, .78
Total pre	.19*	.59	.48, .71	.24**	.65**	.57, .73	.26**	.63**	.54, .72
Total post	.39**	.75**	.58, .92	.18	.63	.49, .78	.27*	.62	.47, .77
SAVRY									
Historical.	.23**	.58	.47, .69	.11	.59*	.51, .68	.17*	.59*	.50, .68
Social/contextual	.11	.55	.45, .66	.08	.63**	.54, .71	.10	.61*	.52, .70
Individual/clinical	.17*	.61*	.50, .72	.29**	.69***	.61, .77	.31***	.69***	.61, .77
Total	.19*	.60	.49, .72	.19*	.66***	.57, .74	.22**	.67**	.57, .74
Protective	-.10	.56	.46, .67	-.07	.60*	.51, .68	-.10	.61*	.52, .70
PCL: YV									
Interpersonal	.06	.51	.41, .62	-.07	.50	.42, .59	-.04	.51	.42, .60
Affective	.16	.58	.47, .70	.06	.54	.45, .63	.12	.54	.45, .63
Lifestyle	.09	.57	.47, .68	.08	.58	.49, .67	.11	.59*	.50, .69
Antisocial	.22**	.62*	.51, .72	.24**	.66***	.58, .74	.28***	.68***	.60, .77
Total	.20*	.60	.50, .71	.13	.63**	.54, .71	.18*	.64**	.55, .73
LSI-SK									
Risk category	.05	.53	.44, .63	.22**	.61**	.53, .69	.19*	.59*	.51, .67
SAPROF-YV									
Resilience	-.15	.57	.47, .68	-.16*	.59	.50, .67	-.19*	.59	.50, .69
Motivational	-.06	.54	.44, .65	-.27**	.67***	.59, .76	-.25**	.68***	.60, .77
Relational	-.15	.59	.48, .69	-.12	.63**	.55, .72	-.15*	.64**	.56, .73
External	-.08	.51	.41, .62	-.03	.53	.45, .62	-.05	.52	.43, .61
Total	-.15	.59	.49, .70	-.24**	.68***	.60, .76	-.26**	.68***	.60, .77
	Nonviolent recidivism								
VRS-YV									
Stable	.15	.57	.48, .67	.12	.60	.50, .70	.14	.60	.50, .70
Dynamic pre	.05	.58	.49, .68	.10	.60	.50, .69	.10	.60	.50, .69
Dynamic post	.12	.65	.49, .81	.04	.61	.46, .78	.09	.61	.44, .78
Total pre	.07	.58	.49, .67	.09	.60	.50, .69	.09	.60	.50, .70
Total post	.13	.64	.48, .80	.03	.60	.44, .77	.08	.60	.43, .78
SAVRY									
Historical.	.21*	.58	.49, .68	.17*	.57	.47, .68	.20**	.56	.46, .67
Social/contextual	.14	.57	.48, .67	.10	.58	.48, .67	.13	.58	.49, .68
Individual/clinical	.12	.63*	.54, .72	.18*	.64**	.55, .73	.21**	.65**	.56, .74
Total	.20*	.63*	.53, .72	.19*	.61*	.52, .71	.22**	.61*	.51, .71
Protective	-.22**	.61*	.51, .70	-.14	.56	.46, .67	-.19*	.57	.47, .68

(Continued)	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	*r*	AUC	95%CI	*r*	AUC	95%CI
PCL: YV									
Interpersonal	-.04	.51	.41, .60	-.02	.56	.47, .65	-.04	.56	.47, .66
Affective	.07	.57	.47, .66	-.10	.49	.40, .59	-.06	.50	.40, .60
Lifestyle	.07	.63**	.54, .72	.10	.59	.49, .70	.12	.60*	.50, .71
Antisocial	.16	.59	.49, .68	.15	.64**	.54, .73	.17*	.63*	.53, .72
Total	.09	.61*	.51, .70	.05	.62*	.52, .71	.07	.61*	.52, .71
LSI-SK									
Risk category	.04	.55	.47, .64	.22**	.61*	.52, .70	.20**	.62*	.52, .71
SAPROF-YV									
Resilience	-.13	.61*	.52, .70	-.08	.52	.42, .63	-.12	.54	.43, .64
Motivational	-.13	.61*	.52, .71	-.22**	.65**	.55, .75	-.24**	.66**	.56, .76
Relational	-.19*	.61*	.52, .71	-.13	.62*	.52, .71	-.17*	.62*	.53, .72
External	-.08	.56	.47, .65	.03	.57	.48, .67	-.002	.57	.48, .67
Total	-.21*	.66**	.57, .75	-.17*	.65**	.56, .75	-.22**	.66**	.57, .75
	Any recidivism								
VRS-YV									
Stable	.18*	.61*	.51, .70	.13	.60*	.50, .70	.16*	.61*	.50, .71
Dynamic pre	.08	.59	.50, .69	.14	.60	.50, .70	.14	.60	.50, .70
Dynamic post	.17	.71*	.56, .86	.07	.63	.47, .80	.13	.63	.45, .80
Total pre	.10	.60*	.50, .69	.12	.60*	.51, .70	.13	.60*	.50, .70
Total post	.17	.71*	.56, .86	.06	.62	.45, .79	.12	.62	.44, .80
SAVRY									
Historical	.24**	.60*	.51, .69	.16*	.58	.47, .69	.20**	.57	.46, .68
Social/contextual	.14	.56	.47, .66	.10	.58	.49, .68	.13	.59	.49, .69
Individual/clinical	.14	.64**	.55, .73	.21**	.66**	.57, .74	.23**	.66**	.57, .75
Total	.22*	.64**	.55, .73	.20**	.62*	.53, .72	.24**	.62*	.52, .72
Protective	-.21*	.60	.50, .69	-.13	.56	.46, .67	-1.8*	.57	.47, .68
PCL: YV									
Interpersonal	-.02	.54	.44, .63	-.03	.58	.48, .67	-.04	.58	.48, .67
Affective	.09	.59	.49, .68	-.07	.50	.40, .60	-.03	.51	.41, .61
Lifestyle	.08	.63**	.54, .72	.09	.60*	.50, .71	.12	.61*	.51, .72
Antisocial	.18*	.61*	.52, .70	.17*	.64**	.55, .74	.20**	.63*	.53, .73
Total	.12	.63*	.53, .72	.06	.63*	.54, .73	.09	.61*	.50, .71
LSI-SK									
Risk category	.04	.58	.49, .66	.23**	.61*	.52, .71	.20**	.62*	.53, .72
SAPROF-YV									
Resilience	-.15	.62*	.52, .71	-.08	.54	.43, .64	-.12	.55	.44, .65
Motivational	-.12	.61*	.51, .70	-.24**	.65**	.55, .75	-.26**	.66**	.57, .76
Relational	-.20*	.63**	.54, .72	-.13	.62*	.52, .71	-.17*	.62*	.53, .72
External	-.09	.56	.47, .65	.03	.57	.48, .67	-.002	.57	.48, .67
Total	-.21*	.66**	.57, .75	-.19*	.66**	.57, .75	-.24**	.66**	.57, .76

Note: *** *p* < .001, *p* ** < .01, *p* * < .05

Table 3.9

Non- Indigenous Youth Predictive Validity: Forensic Risk Measures, Component, and Factor AUCs for Fixed Follow-up Recidivism

Measure	Violent recidivism				Nonviolent recidivism				Any recidivism			
	3-year		5-year		3-year		5-year		3-year		5-year	
	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI
VRS-YV												
Stable	.54	.34, .74	.60	.43, .77	.67*	.52, .81	.64	.49, .78	.64	.49, .78	.62	.47, .77
Dynamic pre	.63	.46, .79	.74**	.60, .88	.81***	.69, .92	.78***	.67, .90	.78***	.66, .90	.79***	.67, .91
Dynamic post	.58	.30, .86	.78*	.58, .99	.85*	.68, 1.0	.86*	.69, 1.0	.79*	.58, 1.0	.85*	.66, 1.0
Total pre	.61	.44, .79	.72*	.57, .86	.79***	.67, .91	.76**	.64, .89	.76**	.64, .89	.76**	.64, .89
Total post	.55	.25, .85	.76	.53, .98	.86*	.69, 1.0	.86*	.68, 1.0	.79*	.59, 1.0	.84*	.65, 1.0
SAVRY												
Historical	.57	.37, .76	.64	.47, .80	.71**	.57, .84	.71**	.57, .85	.68*	.53, .82	.70*	.56, .84
Social/contextual	.61	.42, .79	.66	.50, .81	.80***	.69, .92	.75**	.62, .88	.77**	.65, .90	.77**	.64, .89
Individual/clinical	.66	.50, .82	.76**	.62, .89	.84***	.73, .95	.81***	.68, .93	.82***	.70, .94	.80***	.68, .93
Total	.64	.46, .81	.72*	.58, .86	.83***	.71, .94	.79***	.67, .91	.80***	.68, .92	.79***	.67, .91
Protective	.63	.44, .81	.63	.47, .78	.79***	.68, .91	.78***	.66, .90	.77**	.65, .89	.77**	.65, .90
PCL: YV												
Interpersonal	.49	.32, .67	.54	.37, .71	.61	.46, .77	.56	.41, .71	.62	.47, .77	.54	.38, .69
Affective	.54	.35, .72	.59	.43, .75	.67*	.52, .81	.65	.50, .80	.66*	.52, .81	.64	.49, .79
Lifestyle	.69*	.54, .84	.78**	.66, .90	.76**	.64, .89	.75**	.62, .88	.76**	.63, .89	.77**	.64, .90
Antisocial	.53	.35, .71	.64	.48, .80	.73**	.60, .87	.70*	.56, .84	.70*	.56, .84	.69*	.55, .83
Total	.57	.41, .74	.68*	.53, .83	.74**	.61, .87	.71**	.57, .84	.73**	.60, .86	.70*	.56, .84
LSI-SK												
Risk category	.68*	.53, .83	.72**	.58, .85	.75**	.62, .87	.73**	.60, .86	.73**	.60, .86	.73**	.60, .86
SAPROF-YV												
Resilience	.56	.39, .74	.63	.48, .78	.65	.50, .79	.61	.45, .76	.62	.46, .77	.62	.46, .77
Motivational	.67	.49, .85	.68*	.52, .84	.82***	.70, .93	.77**	.64, .89	.79***	.67, .91	.74**	.61, .87
Relational	.61	.43, .79	.63	.47, .78	.72**	.58, .85	.69*	.55, .83	.69*	.55, .83	.69*	.55, .83
External	.58	.40, .76	.61	.45, .76	.66*	.51, .80	.58	.43, .73	.65	.50, .79	.60	.45, .75
Total	.65	.47, .84	.69*	.54, .84	.80***	.68, .92	.74**	.61, .88	.77**	.64, .90	.73**	.59,.87

*Note: *** $p < .001$, p ** $< .01$, p * $< .05$

Table 3.10

Non-Indigenous Youth Predictive Validity: Forensic Risk Measures, Component and Factor

Score AUCs for Youth, Adult, and Total Recidivism

Measure	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	*r*	AUC	95%CI	*r*	AUC	95%CI
				Violent recidivism					
VRS-YV									
Stable	.17	.50	.25, .75	.23	.60	.44, .76	.26	.57	.41, .73
Dynamic pre	.31*	.60	.35, .85	.24	.70*	.55, .84	.30*	.67*	.52, .82
Dynamic post	.16	.68	.43, .93	.25	.71	.48, .95	.21	.71	.48, .95
Total pre	.28	.55	.30, .80	.26	.68*	.54, .83	.31*	.65	.50, .80
Total post	.13	.57	.31, .83	.23	.67	.42, .92	.19	.67	.42, .92
SAVRY									
Historical.	.37*	.59	.30, .87	.25	.60	.44, .76	.37**	.62	.46, .78
Social/contextual	.11	.59	.39, .79	.26	.59	.43, .74	.24	.58	.43, .74
Individual/clinical	.21	.60	.36, .84	.28*	.70*	.55, .84	.29*	.68*	.54, .83
Total	.26	.60	.36, .84	.31*	.67*	.52, .82	.34*	.66*	.51, .81
Protective	-.08	.58	.28, .88	-.07	.56	.46, .67	-.07	.58	.43, .74
PCL: YV									
Interpersonal	-.01	.46	.26, .65	-.12	.56	.40, .72	-.10	.55	.40, .70
Affective	.07	.52	.32, .72	-.06	.57	.42, .73	-.03	.55	.40, .70
Lifestyle	.15	.53	.31, .75	.21*	.74**	.60, .88	.27*	.72**	.57, .86
Antisocial	.17	.47	.19, .74	.25	.67*	.52, .82	.26	.62	.47, .77
Total	.11	.47	.23, .71	.13	.68*	.53, .82	.14	.64	.49, .78
LSI-SK									
Risk category	.18	.62	.41, .83	.30*	.62	.47, .77	.30*	.61	.46, .75
SAPROF-YV									
Resilience	-.17	.55	.32, .79	-.07	.57	.47, .68	-.13	.61	.46, .76
Motivational	-.19	.60	.31, .89	-.10	.54	.44, .65	-.14	.67*	.52, .82
Relational	-.09	.57	.32, .82	-.18	.59	.48, .69	-.17	.61	.46, .76
External	-.05	.55	.26, .84	-.23	.51	.41, .62	-.19	.55	.40, .71
Total	-.17	.61	.34, .88	-.16	.59	.49, .70	-.18	.67*	.52, .82
				Nonviolent recidivism					
VRS-YV									
Stable	.21	.65	.49, .82	.18	.62	.47, .77	.22	.61	.46, .77
Dynamic pre	.38*	.78**	.64, .92	.28*	.73**	.60, .86	.33*	.74**	.61, .87
Dynamic post	.29	.79	.54, 1.0	.56*	.90**	.75, 1.0	.59**	.90**	.75, 1.0
Total pre	.37*	.76**	.62, .91	.28*	.72**	.59, .85	.34*	.73**	.59, .86
Total post	.31	.78	.52, 1.0	.53*	.91**	.77, 1.0	.56*	.91**	.77, 1.0
SAVRY									
Historical.	.24	.72*	.56, .88	.23	.70*	.56, .84	.27*	.67*	.53, .81
Social/contextual	.32*	.82**	.70, .95	.44*	.68*	.54, .82	.48***	.69*	.55, .83
Individual/clinical	.34*	.82**	.70, .95	.28*	.76**	.63, .89	.33*	.76**	.63, .90
Total	.34*	.82**	.69, .95	.35*	.75**	.62, .88	.40**	.75**	.62, .88
Protective	-.26	.74*	.58, .90	-.32*	.67*	.53, .81	-.36**	.70*	.57, .84

(Continued)	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	*r*	AUC	95%CI	*r*	AUC	95%CI
PCL: YV									
Interpersonal	-.01	.49	.31, .68	.07	.53	.37, .68	.05	.50	.35, .66
Affective	.17	.64	.47, .81	-.13	.56	.40, .72	-.09	.59	.43, .75
Lifestyle	.31*	.81**	.68, .94	.26	.70*	.56, .84	.31*	.70*	.56, .85
Antisocial	.19	.65	.48, .83	.20	.68*	.54, .82	.23	.67*	.53, .82
Total	.19	.67	.51, .83	.12	.66*	.51, .80	.15	.65	.50, .80
LSI-SK									
Risk category	.29	.72*	.58, .87	.34*	.67*	.52, .81	.38**	.68*	.53, .82
SAPROF-YV									
Resilience	-.19	.65	.49, .81	-.14	.59	.43, .75	-.17	.58	.42, .74
Motivational	-.33*	.82**	.68, .97	-.28*	.72**	.58, .86	-.33*	.73**	.59, .86
Relational	-.26	.76**	.61, .91	-.20	.61	.46, .76	-.25	.63	.48, .78
External	-.20	.67	.50, .84	-.16	.56	.40, .71	-.19	.57	.42,.72
Total	-.32*	.83***	.70, .97	-.26	.69*	.54, .83	-.31*	.70*	.55, .84
	Any recidivism								
VRS-YV									
Stable	.21	.65	.49, .82	.17	.59	.43, .75	.21	.59	.43, .75
Dynamic pre	.38**	.78**	.64, .92	.27	.74**	.60, .88	.33*	.74**	.60, .88
Dynamic post	.27	.79	.54, 1.0	.49*	.85*	.64, 1.0	.48*	.85*	.64, 1.0
Total pre	.37*	.76**	.62, .91	.27*	.71*	.57, .86	.33*	.71*	.57, .86
Total post	.27	.78	.52, 1.0	.43	.85*	.66, 1.0	.44	.85*	.66, 1.0
SAVRY									
Historical	.30*	.72*	.56, .88	.22	.64	.49, .80	.29*	.64	.49, .80
Social/contextual	.28	.82**	.70, .95	.43**	.68*	.54, .83	.46***	.68*	.54, .83
Individual/clinical	.33*	.82**	.70, .95	.27	.73**	.59, .88	.32*	.73**	.59, .88
Total	.34*	.82**	.69, .95	.34*	.72**	.58, .86	.40**	.72**	.58, .86
Protective	-.23	.74*	.58, .90	-.29*	.70*	.55, .84	-.32*	.70*	.55, .84
PCL: YV									
Interpersonal	-.01	.49	.31, .68	.07	.53	.37, .69	.04	.53	.37, .69
Affective	.15	.64	.47, .81	-.13	.60	.42, .77	-.10	.60	.42, .77
Lifestyle	.28	.81**	.68, .94	.24	.71*	.56, .86	.29*	.71*	.56, .86
Antisocial	.20	.65	.48, .83	.19	.66	.51, .82	.22	.66	.51, .82
Total	.18	.67	.51, .83	.12	.66	.49, .82	.14	.66	.49, .82
LSI-SK									
Risk category	.27	.72*	.58, .87	.32*	.65	.48, .81	.36**	.65	.48, .81
SAPROF-YV									
Resilience	-.20	.65	.49, .81	-.11	.57	.39, .74	-.16	.57	.39, .74
Motivational	-.31*	.82**	.68, .97	-.27	.73**	.60, .87	-.31*	.73**	.60, .87
Relational	-.22	.76**	.61, .91	-.19	.64	.49, .80	-.23	.64	.49, .80
External	-.16	.67	.50, .84	-.14	.56	.40, .72	-.17	.56	.40, .72
Total	-.30*	.83***	.70, .97	-.25	.69*	.55, .84	-.29*	.69*	.55, .84

*Note: *** $p < .001$, $p ** < .01$, $p * < .05$

3.6.2 *Predictive Accuracy of Forensic Measures for Male and Female Subgroups*

Finally, the predictive accuracy of the forensic risk measures and component/ factor scores was examined among gender subgroups, including the three- and five-year predictive accuracy for violent, non-violent, and any recidivism for fixed period follow-ups and the youth, adult, and total recidivism for violent, non-violent, and any recidivism for males (Tables 3.11 and 3.12) and females (Tables 3.13 and 3.14).

In regard to the pattern of predictive accuracy for violent recidivism for males, the measures demonstrated good predictive accuracy at the three- and five-year follow-ups. The measures that were significant at the $p < .05$ level for the three-year follow-up included the VRS-YV stable, dynamic, and total post-treatment scores, PCL: YV affective and total scores, and the SAPROF-YV relational score. The SAVRY historical and protective scores, PCL: YV lifestyle score, and the LSI risk category were all predictive at the $p < .01$ level. Finally, the VRS-YV pre-treatment dynamic and total scores, SAVRY social/contextual, individual/ clinical, and total scores, PCL: YV antisocial score, and the SAPROF-YV motivational and total scores were significant at the $p < .001$ level. The PCL: YV interpersonal score and the SAPROF-YV resilience and external scores were not significantly predictive of violent recidivism at the three-year follow-up. The five-year fixed follow-up evidenced a very similar pattern for males, with some predictive variables changing significance levels, and the VRS-YV stable and post-treatment total becoming non-significant. Alternatively, females' three- and five- year fixed follow-ups evidenced fewer significantly predictive findings with the VRS-YV dynamic and total pre-treatment scores and the dynamic post-treatment score, SAVRY historical and total scores, and PCL: YV interpersonal and antisocial scores demonstrating significant prediction of violent recidivism at three-year follow-up at the $p < .05$ level. All other scores were not significant. A similar pattern emerged for the five-year follow-up. It is important to note that many of the AUC values for the females' scores were in the small-medium range, and thus it is possible that the low number of females with forensic measure and factor/ component scores available ($n = 59$) may explain the non-significance of some scores.

Similarly, the prediction of youth, adult, and total recidivism for males evidenced a pattern of significantly predictive scores. For youth violent recidivism, the VRS-YV total pre-treatment score, SAVRY historical and protective scores, and PCL: YV affective and lifestyle scores were significant at the $p < .05$ level. The VRS-YV dynamic pre-treatment and dynamic

and total post-treatment scores, SAVRY social/contextual, individual/ clinical, and total scores, PCL: YV antisocial score, and SAPROF-YV motivational and total scores were all significant at the $p < .01$ level. All other variables were not significant. For adult violent recidivism most scores were significant. The VRS-YV dynamic post-treatment score was significant at the $p < .05$ level and the VRS-YV stable score, SAVRY protective score, LSI-SK risk category, and the SAPROF-YV resilience and relations scores were significant at the $p < .01$ level. Additionally, the VRS-YV dynamic and total pre-treatment scores, SAVRY historical, social/contextual, individual/ clinical and total scores, PCL: YV lifestyle, antisocial, and total scores, and the SAPROF-YV motivational and total scores were all significant at the $p < .001$ level. The VRS-YV total post-treatment score, PCL: YV interpersonal and affective scores, and the SAPROF-YV external score were the only scores to remain non-significant predictors of adult violent recidivism in males. For total recidivism, a similar pattern emerged with all scores except the PCL: YV interpersonal and affective scores being significantly predictive, and all at either the $p < .01$ or $p < .001$ level. Female scores again struggled to become significant, with no scores being significant predictors of female youth violent recidivism. However, for female adult violent recidivism the VRS-YV dynamic and total post-treatment scores, SAVRY historical, social/contextual, individual/ clinical and total scores, PCL: YV lifestyle and total scores, and the SAPROF-YV relational score were all significant at the $p < .05$ level and the VRS-YV stable, pre-treatment dynamic, and pre-treatment total scores and the PCL: YV antisocial score were significant at the $p < .01$ level. Many of those variables remained predictive for total violent recidivism.

For non-violent recidivism at the three-year fixed follow-up for males, almost all of the scores were significant at either the $p < .05$, $p < .01$, or $p < .001$ level with the exception of the PCL: YV interpersonal and affective scores which were not significant. A similar pattern was demonstrated for the five-year fixed follow up, but the SAPROF-YV resilience and external factors were no longer significant predictors of male non-violent recidivism. Alternatively, females evidenced only a small number of significantly predictive scores for non-violent recidivism including the VRS-YV post-treatment dynamic score and the PCL: YV interpersonal, antisocial, and total scores, all significant at the $p < .05$ level. All other scores were not significant predictors. More scores became significant at the five-year fixed follow-up, with the VRS-YV stable, dynamic and total pre-treatment scores, SAVRY individual/ contextual, LSI-SK

risk category and the SAPROF-YV motivational and total scores also becoming predictive at the $p < .05$ level and the PCL: YV antisocial score becoming significant at the $p < .01$ level.

For male youth recidivism, all scores were significant predictors of non-violent recidivism with the exception of the PCL: YV interpersonal score. For adult recidivism non-violent recidivism, most variables remained significant predictors, but the PCL: YV affective score and SAPROF-YV resilience score joined the PCL: YV interpersonal as non-predictive scores. The pattern of prediction for total non-violent recidivism mimicked that of adult non-violent recidivism. For females, no scores were predictive of youth non-violent recidivism while adult and total non-violent recidivism prediction were very similar. The VRS-YV dynamic and total pre-treatment scores, SAVRY historical, individual/ clinical, and total scores, PCL: YV total score, LSI-SK risk category, and SAPROF-YV motivational, relational and total scores were significant at the $p < .05$ level for adult non-violent recidivism (with the PCL: YV lifestyle score becoming significant and the SAPROF-YV total score becoming non-significant for total recidivism). The VRS-YV stable score and the PCL: YV antisocial score were also significant for female non-violent adult recidivism at the $p < .01$ level (with the SAPROF-YV motivational score also becoming significant at this level for total recidivism). All other scores were not significant predictors of non-violent adult or total recidivism.

Finally, regarding any recidivism, the above pattern for males and females continues. Most scores are significantly predictive of any recidivism at the three- and five-year follow-ups for males, while a small number of scores are significant predictors of any recidivism for females. This pattern repeats for youth, adult, and total recidivism for any type of recidivism with results looking similar to the non-violent prediction patterns.

Table 3.11

Male Youth Predictive Validity: Forensic Risk Measures, Component, and Factor AUCs for Fixed Follow-up Recidivism

| Measure | Violent recidivism | | | | Nonviolent recidivism | | | | Any recidivism | | | |
| | 3-year | | 5-year | | 3-year | | 5-year | | 3-year | | 5-year | |
	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI
VRS-YV												
Stable	.60*	.51, .68	.58	.50, .66	.64**	.56, .72	.61**	.53, .70	.64**	.56, .72	.62**	.53, .70
Dynamic pre	.67***	.59, .75	.69***	.62, .76	.70***	.63, .78	.69***	.61, .77	.71***	.64, .79	.70***	.62, .79
Dynamic post	.66*	.52, .80	.67*	.54, .79	.68*	.55, .80	.64*	.50, .79	.70**	.58, .83	.68*	.55,.82
Total pre	.66***	.58, .74	.67***	.59, .75	.70***	.62, .77	.68***	.60, .76	.71***	.63, .78	.70***	.61, .78
Total post	.64*	.50, .78	.63	.51, .76	.67*	.54, .80	.64*	.50, .78	.69**	.56, .82	.67*	.53, .81
SAVRY												
Historical	.62**	.54, .70	.62**	.55, .70	.68***	.60, .76	.67***	.59, .75	.67***	.59, .75	.67***	.58, .75
Social/contextual	.67***	.60, .75	.67***	.59, .74	.73***	.66, .80	.70***	.62, .78	.73***	.65, .80	.71***	.64, .79
Individual/clinical	.68***	.61, .76	.73***	.66, .80	.75***	.68, .82	.73***	.65, .80	.76***	.69, .83	.74***	.67, .82
Total	.68***	.60, .76	.70***	.62, .77	.74***	.67, .82	.72***	.64, .80	.74***	.67, .82	.73***	.65, .81
Protective	.63**	.55, .71	.61**	.54, .69	.69***	.61, .76	.67***	.59, .75	.68***	.60, .76	.67***	.58, .75
PCL: YV												
Interpersonal	.46	.37, .54	.51	.43, .59	.50	.42, .59	.49	.41, .58	.52	.44, .60	.50	.41, .58
Affective	.59*	.50, .67	.59*	.51, .67	.58	.50, .66	.56	.47, .65	.60	.52, .68	.58	.49, .67
Lifestyle	.62**	.54, .70	.68***	.60, .76	.72***	.64, .79	.70***	.62, .78	.73***	.65, .80	.72***	.63, .80
Antisocial	.67***	.59, .75	.67***	.60, .75	.69***	.61, .77	.68***	.60, .76	.69***	.61, .77	.69***	.61, .77
Total	.61*	.53, .69	.65***	.57, .73	.66***	.59, .74	.64**	.56, .73	.68***	.60, .76	.66***	.58, .75
LSI-SK												
Risk category	.63**	.56, .71	.65***	.57, .72	.68***	.60, .75	.65***	.57, .73	.69***	.62, .77	.67***	.59, .75
SAPROF-YV												
Resilience	.58	.50, .67	.62**	.54, .70	.60*	.51, .70	.58	.49, .66	.60*	.51, .68	.59	.50, .68
Motivational	.67***	.59, .75	.68***	.61, .76	.74***	.67, .81	.70***	.62, .78	.74***	.67, .81	.70***	.62, .78
Relational	.61*	.53, .69	.61*	.52, .69	.68***	.60, .75	.65**	.57, .73	.67***	.59, .75	.65**	.57, .73
External	.57	.49, .65	.54	.46, .62	.62**	.54, .70	.58	.50, .66	.62**	.54, .70	.58	.50, .67
Total	.67***	.59, .74	.67***	.59, .75	.72***	.65, .80	.68***	.60, .76	.72***	.65, .80	.69***	.61, .77

*Note: *** p < .001, p ** < .01, p * < .05

Table 3.12

Male Youth Predictive Validity: Forensic Risk Measures, Component and Factor score AUCs for Youth, Adult, and Total Recidivism

	Youth recidivism			Adult recidivism			Total recidivism		
Measure	r	AUC	95%CI	r	AUC	95%CI	r	AUC	95%CI
				Violent recidivism					
VRS-YV									
Stable	.21**	.58	.47, .70	.26***	.63**	.55, .1	.27***	.61**	.53, .69
Dynamic pre	.22**	.65**	.55, .76	.31***	.68***	.60, .75	.32***	.67***	.59, .75
Dynamic post	.35**	.79**	.63, .96	.29*	.65*	.52, .78	.34**	.66*	.54, .79
Total pre	.23**	.64*	.54, .75	.30***	.67***	.60, .75	.32***	.67***	.59, .75
Total post	.36**	.77**	.59, .94	.28*	.63	.50, .76	.33**	.64*	.51, .77
SAVRY									
Historical.	.25**	.64*	.53, .74	.26***	.65***	.58, .73	.30***	.66***	.58, .74
Social/contextual	.16*	.65**	.55, .75	.25**	.67***	.59, .74	.25***	.67***	.59, 75
Individual/clinical	.20*	.66**	.56, .76	.34***	.72***	.65, .79	.35***	.72***	.65, .80
Total	.25**	.68**	.57, .78	.33***	.71***	.64, .78	.35***	.72***	.64, .79
Protective	-.10	.61*	.51, .71	-.16*	.63**	.55, .71	-.17*	.64**	.56, .72
PCL: YV									
Interpersonal	-.08	.46	.36, .57	-.14	.51	.43, .59	-.14	.50	.42, .58
Affective	.19*	.63*	.52, .74	.08	.58	.50, .66	.12	.58	.49, .66
Lifestyle	.17*	.63*	.54, .73	.17*	.65***	.57, .74	.20**	.68***	.60, .76
Antisocial	.23*	.65**	.54, .75	.30***	.68***	.61, .76	.32***	.69***	.62, .77
Total	.20*	.61	.50, .71	.15*	.65***	.57, .73	.19*	.65***	.57, .73
LSI-SK									
Risk category	.13	.60	.50, .69	.28**	.62**	.54, .69	.27***	.62**	.54, .70
SAPROF-YV									
Resilience	-.16*	.60	.50, .71	-.20**	.64**	.56, .72	-.23**	.64**	.56, .72
Motivational	-.17*	.65**	.55, .75	-.31***	.71***	.63, .78	-.31***	.72***	.64, .79
Relational	-.12	.59	.49, .69	-.21**	.63**	.56, .71	-.21**	.64**	.56, .72
External	-.09	.56	.45, .66	-.14	.56	.48, .64	-.15*	.57	.48, .65
Total	-.18*	.66**	.56, .75	-.30***	.70***	.63, .78	-.31***	.71***	.64, .79
				Nonviolent recidivism					
VRS-YV									
Stable	.26**	.64**	.56, .73	.24**	.64**	.55, .73	.27***	.63**	.54, .73
Dynamic pre	.19*	.69***	.61, .77	.26***	.68***	.59, .76	.27***	.68***	.59, .76
Dynamic post	.23	.72**	.58, .86	.26*	.71**	.57, .85	.31**	.71**	.57, .85
Total pre	.21**	.69***	.61, .77	.26***	.68***	.59, .77	.27***	.68***	.59, .77
Total post	.25	.71*	.57, .85	.25*	.71**	.57, .85	.30*	.71**	.57, .85
SAVRY									
Historical.	.32***	.68***	.60, .77	.35***	.68***	.59, .77	.38***	.67***	.58, .76
Social/contextual	.28***	.73***	.65, .80	.33***	.68***	.60, .76	.36***	.68***	.60, .76
Individual/clinical	.21**	.72***	.64, .80	.37***	.73***	.65, .81	.33***	.73***	.65, .81
Total	.32***	.74***	.67, .82	.38***	.73***	.65, .81	.42***	.72***	.64, .81
Protective	-.28***	.68***	.60, .76	-.27***	.63***	.54, .72	-.32***	.64**	.55, .73

(Continued)	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	*r*	AUC	95%CI	*r*	AUC	95%CI
PCL: YV									
Interpersonal	-.14	.47	.38, .57	-.09	.51	.42, .60	-.12	.50	.41, .59
Affective	.07	.62*	.53, .71	-.01	.56	.47, .65	.01	.56	.47, .65
Lifestyle	.16*	.73***	.65, .81	.24**	.70***	.60, .79	.26***	.69***	.60, .79
Antisocial	.23**	.68***	.59, .76	.27***	.69***	.61, .78	.30***	.69***	.60, .77
Total	.11	.66**	.56, .75	.14*	.65**	.56, .74	.16*	.65**	.56, .74
LSI-SK									
Risk category	.14	.62**	.54, .70	.31***	.63**	.54, .72	.31***	.63**	.54, .72
SAPROF-YV									
Resilience	-.17*	.62**	.54, .71	-.16*	.58	.49, .67	-.20**	.57	.48, .67
Motivational	-.24**	.72***	.64, .80	-.33***	.70***	.62, .79	-.36***	.70***	.61, .79
Relational	-.26**	.69***	.61, .77	-.23**	.62**	.54, .71	-.27***	.63**	.54, .72
External	-.22**	.63**	.54, .71	-.07	.60*	.51, .69	-.13	.60*	.51, .69
Total	-.30***	.75***	.67, .82	-.29***	.69***	.61, .77	-.34***	.69***	.61, .77
	Any recidivism								
VRS-YV									
Stable	.28**	.68***	.59, .76	.25**	.63**	.54, .72	.28***	.63**	.54, .72
Dynamic pre	.21*	.70***	.62, .78	.27***	.68***	.59, .77	.28***	.68***	.59, .77
Dynamic post	.27	.77**	.65, .90	.26*	.69*	.54, .84	.31**	.69*	.54, .84
Total pre	.23**	.70***	.62, .78	.27***	.68***	.59, .77	.28***	.68***	.59, .77
Total post	.28*	.77**	.64, .90	.24*	.69*	.53, .84	.30*	.69*	.54, .84
SAVRY									
Historical	.33***	.70***	.62, .79	.35***	.66**	.57, .75	.38***	.66**	.57, .75
Social/contextual	.28***	.72***	.64, .80	.33***	.68***	.60, .76	.36***	.68***	.60, .76
Individual/clinical	.22**	.74***	.66, .81	.32***	.73***	.65, .81	.33***	.73***	.65, .81
Total	.33***	.76***	.69, .84	.39***	.72***	.64, .80	.42***	.72***	.64, .80
Protective	-.27**	.67***	.59, .76	-.26***	.63**	.54, .73	-.31***	.63**	.54, .73
PCL: YV									
Interpersonal	-.14	.50	.41, .60	-.10	.52	.43, .61	-.13	.52	.43, .61
Affective	.10	.64**	.55, .72	-.004	.58	.49, .67	.03	.58	.49, .67
Lifestyle	.18*	.75***	.67, .82	.22**	.71***	.62, .80	.25**	.71***	.62, .80
Antisocial	.25**	.69***	.67, .77	.29***	.68***	.59, .77	.31***	.68***	.59, .77
Total	.14	.68***	.59, .76	.14*	.67**	.57, .76	.16*	.67**	.57, .76
LSI-SK									
Risk category	.15*	.64**	.56, .72	.31***	.62*	.53, .72	.32***	.62*	.53, .72
SAPROF-YV									
Resilience	-.18*	.64**	.56, .73	-.16*	.58	.48, .68	-.19**	.58	.48, .68
Motivational	-.25**	.72***	.64, .80	-.35***	.70***	.61, .79	-.37***	.70***	.61, .79
Relational	-.25**	.70***	.62, .78	-.23**	.63**	.54, .72	-.26***	.63**	.54, .72
External	-.21**	.61*	.52, .70	-.06	.60*	.51, .69	-.11	.60*	.51, .69
Total	-.30***	.75***	.68, .83	-.30***	.69***	.61, .78	-.35***	.69***	.61, .78

*Note: *** $p < .001$, p ** $< .01$, p * $< .05$

Table 3.13

Female Youth Predictive Validity: Forensic Risk Measures, Component, and Factor AUCs for Fixed Follow-up Recidivism

| Measure | Violent recidivism | | | | Nonviolent recidivism | | | | Any recidivism | | | |
| | 3-year | | 5-year | | 3-year | | 5-year | | 3-year | | 5-year | |
	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI	AUC	95%CI
VRS-YV												
Stable	.67	.49, .86	.69*	.53, .85	.60	.44, .76	.68*	.54, .82	.62	.46, .78	.68*	.54, .82
Dynamic pre	.68*	.53, .84	.66	.51, .81	.64	.49, .79	.68*	.54, .82	.64	.49, .79	.68*	.54, .82
Dynamic post	.88*	.68, 1.0	.89*	.68, 1.0	.88*	.68, 1.0	.83*	.60, 1.0	.88*	.68, 1.0	.83*	.60, 1.0
Total pre	.68*	.53, .84	.66*	.50, .82	.61	.45, .77	.66*	.51, .80	.62	.46, .77	.66*	.51, .80
Total post	.82	.59, 1.0	.82	.59, 1.0	.82	.59, 1.0	.82*	.58, 1.0	.82	.59, 1.0	.82*	.58, 1.0
SAVRY												
Historical	.72*	.59, .86	.72**	.59, .86	.63	.48, .78	.64	.50, .78	.64	.49, .78	.64	.50, .78
Social/contextual	.50	.31, .69	.54	.37, .71	.50	.34, .67	.54	.40, .69	.51	.36, .67	.54	.40, .69
Individual/clinical	.67	.51, .83	.66*	.52, .81	.63	.49, .78	.67*	.53, .81	.62	.48, .76	.67*	.53, .81
Total	.68*	.53, .83	.67*	.52, .82	.60	.45, .76	.64	.50, .78	.61	.46, .76	.64	.50, .78
Protective	.57	.40, .74	.56	.40, .72	.57	.42, .71	.58	.44, .73	.58	.44, .73	.58	.44, .73
PCL: YV												
Interpersonal	.68*	.52, .83	.58	.42, .74	.68*	.53, .82	.62	.48, .76	.69*	.55, .83	.62	.48, .76
Affective	.50	.33, .67	.51	.35, .67	.53	.37, .69	.49	.34, .64	.67*	.52, .82	.49	.34, .64
Lifestyle	.59	.43, .76	.60	.44, .76	.62	.48, .77	.65	.51, .79	.62	.46, .78	.65	.51, .78
Antisocial	.72*	.57, .87	.70*	.56, .85	.66*	.52, .81	.70**	.56, .84	.69*	.55, .83	.70**	.56, .84
Total	.65	.48, .82	.65	.49, .81	.66*	.50, .81	.65*	.51, .79	.67*	.52, .82	.65*	.51, .79
LSI-SK												
Risk category	.64	.49, .79	.58	.44, .72	.64	.51, .78	.65*	.52, .78	.63	.50, .77	.65*	.52, .78
SAPROF-YV												
Resilience	.60	.42, .77	.57	.41, .73	.61	.45, .76	.59	.44, .74	.60	.45, .75	.59	.44, .74
Motivational	.57	.40, .74	.54	.38, .69	.64	.50, .78	.68*	.54, .81	.61	.47, .76	.68*	.54, .81
Relational	.62	.46, .79	.65	.49, .80	.56	.40, .71	.62	.48, .76	.58	.43, .73	.62	.48, .76
External	.48	.30, .66	.53	.37, .69	.51	.35, .66	.60	.45, .74	.53	.38, .69	.60	.45, .74
Total	.61	.43, .78	.61	.45, .76	.63	.49, .78	.69*	.55, .83	.64	.49, .78	.69*	.55, .83

*Note: *** p < .001, p ** < .01, p * < .05

Table 3.14

Female Youth Predictive Validity: Forensic Risk Measures, Component and Factor score AUCs for Youth, Adult, and Total Recidivism

	Youth recidivism			Adult recidivism			Total recidivism		
Measure	r	AUC	95%CI	r	AUC	95%CI	r	AUC	95%CI
				Violent recidivism					
VRS-YV									
Stable	.25	.60	.39, .81	.46***	.77**	.65, .90	.41**	.71**	.57, .84
Dynamic pre	.22	.59	.40, .78	.33*	.74**	.59, .88	.31*	.67*	.53, 81
Dynamic post	.53	.87	.66, 1.0	.27	.84*	.63, 1.0	.52	.83*	.60, 1.0
Total pre	.25	.58	.38, .78	.36**	.75**	.60, .90	.35**	.67*	.53, .81
Total post	.37	.78	.49, 1.0	.37	.88*	.67, 1.0	.47	.82*	.58, 1.0
SAVRY									
Historical	.33*	.68	.53, .83	.21	.67*	.53, .82	.33*	.68*	.55, .82
Social/contextual	.13	.47	.27, .67	.10	.69*	.53, .84	.14	.60	.45, .75
Individual/clinical	.24	.63	.44, .81	.23	.70*	.54, .85	.28*	.67*	.52, .81
Total	.22	.61	.43, .79	.21	.70*	.54, .85	.26	.68*	.54, .82
Protective	-.10	.54	.35, .73	-.004	.53	.37, .69	-.07	.54	.40, .69
PCL: YV									
Interpersonal	.32*	.58	.39, .78	.08	.55	.39, .72	.18	.61	.46, .76
Affective	.08	.47	.30, .64	.-.05	.50	.35, .66	.02	.49	.34, .64
Lifestyle	.09	.53	.34, .73	.34*	.69*	.54, .85	.25	.61	.47, .76
Antisocial	.30*	.66	.46, .85	.39**	.74**	.60, .87	.39**	.73**	.60, .86
Total	.24	.62	.42, .82	.25	.70*	.55, .85	.28*	.68*	.53, .82
LSI-SK									
Risk category	.04	.54	.35, .72	.17	.59	.45, .73	.12	.55	.41, .69
SAPROF-YV									
Resilience	-.12	.50	.31, .69	-.06	.51	.35, .67	-.12	.51	.36, .66
Motivational	-.02	.48	.31, .66	-.09	.57	.42, .73	-.06	.57	.42, .71
Relational	-.18	.62	.45, .79	-.14	.67*	.52, .82	-.20	.66*	.52, .80
External	-.08	.50	.30, .70	-.02	.52	.37, .68	-.07	.49	.34, .64
Total	-.13	.54	.36, .73	-.12	.62	.46, .78	-.15	.60	.46, .75
				Nonviolent recidivism					
VRS-YV									
Stable	.10	.56	.39, .73	.21	.71**	.58, .84	.21	.72**	.59, .85
Dynamic pre	.13	.57	.40, .74	.08	.67*	.54, .81	.10	.68*	.54, .81
Dynamic post	.52	.81	.57, 1.0	.24	.78	.51, 1.0	.51	.76	.46, 1.0
Total pre	.13	.55	.37, .72	.09	.66*	.52, .80	.10	.66*	.52, .80
Total post	.39	.80	.54, 1.0	.35	.75	.46, 1.0	.48	.77	.47, 1.0
SAVRY									
Historical.	.26	.61	.45, .77	.09	.69*	.55, .83	.16	.67*	.53, .81
Social/contextual	.04	.50	.32, .68	.12	.63	.48, .77	.12	.64	.49, .78
Individual/clinical	.24	.63	.48, .79	.15	.66*	.52, .80	.20	.68*	.54, .81
Total	.22	.58	.41, .75	.14	.68*	.54, .81	.19	.67*	.54, .81
Protective	-.06	.54	.38, .71	-.11	.57	.42, .72	-.12	.59	.44, .74

(Continued)	Youth recidivism			Adult recidivism			Total recidivism		
	r	AUC	95%CI	r	AUC	95%CI	r	AUC	95%CI
PCL: YV									
Interpersonal	.28*	.55	.38, .72	.16	.62	.48, .77	.19	.63	.48, .77
Affective	.12	.53	.36, .69	-.16	.49	.34, .64	-.11	.51	.36, .66
Lifestyle	.16	.63	.46, .79	.19	.64	.50, .79	.22	.67*	.53, .81
Antisocial	.21	.55	.38, .72	.16	.72**	.59, .86	.19	.70**	.57, .84
Total	.24	.58	.41, .75	.11	.67*	.53, .81	.15	.67*	.54, .81
LSI-SK									
Risk category	.15	.59	.44, .74	.25*	.66*	.53, .80	.26*	.68*	.55, .81
SAPROF-YV									
Resilience	-.07	.61	.45, .78	-.09	.53	.38, .69	-.11	.56	.41, .71
Motivational	-.08	.61	.45, .77	-.14	.68*	.54, .82	-.15	.70**	.56, .84
Relational	-.12	.57	.40, .73	-.10	.67*	.53, .80	-.13	.67*	.53, .81
External	.08	.51	.35, .68	-.11	.55	.40, .70	-.08	.55	.40, .70
Total	-.08	.61	.45, .77	-.17	.68*	.54, .82	-.18	.68*	.54, .82

	Any recidivism								
VRS-YV									
Stable	.16	.58	.42, .75	.24	.69*	.55, .82	.26*	.69*	.56, .83
Dynamic pre	.17	.58	.41, .74	.12	.66*	.52, .80	.15	.66*	.52, .80
Dynamic post	.53	.81	.57, 1.0	.25	.78	.51, 1.0	.51	.76	.46, 1.0
Total pre	.18	.56	.38, .73	.12	.65	.50, .79	.16	.65	.51, .79
Total post	.39	.80	.54, 1.0	.36	.75	.46, 1.0	.49	.77	.47, 1.0
SAVRY									
Historical	.30*	.62	.47, .78	.11	.66*	.52, .81	.20	.64	.50, .79
Social/contextual	.07	.51	.33, .68	.12	.59	.45, .74	.13	.60	.46, .75
Individual/clinical	.25	.62	.46, .77	.16	.64	.50, .78	.23	.65*	.51, .79
Total	.23	.59	.43, .75	.15	.65	.51, .79	.22	.64	.50, .79
Protective	-.08	.56	.40, .73	-.11	.55	.40, .70	-.12	.57	.42, .72
PCL: YV									
Interpersonal	.32*	.57	.41, .73	.16	.65	.51, .79	.21	.65*	.51, .79
Affective	.11	.54	.38, .70	-.15	.49	.34, .64	-.09	.51	.36, .66
Lifestyle	.15	.60	.43, .76	.22	.62	.47, .76	.24	.64	.50, .78
Antisocial	.26	.59	.42, .76	.19	.72**	.59, .85	.24	.70*	.56, .83
Total	.26	.60	.42, .75	.13	.66*	.52, .80	.19	.66*	.52, .80
LSI-SK									
Risk category	.13	.58	.43, .73	.25*	.64*	.51, .78	.26*	.66*	.53, .80
SAPROF-YV									
Resilience	-.09	.61	.45, .77	-.09	.50	.35, .65	-.12	.53	.37, .68
Motivational	-.07	.58	.42, .74	-.14	.66*	.51, .80	-.14	.68*	.54, .82
Relational	-.15	.59	.43, .75	-.11	.65	.51, .79	-.15	.65*	.51, .79
External	.04	.54	.38, .70	-.10	.53	.38, .68	-.08	.53	.38, .68
Total	-.10	.61	.45, .77	-.17	.65*	.51, .79	-.19	.65*	.51, .80

*Note: *** $p < .001$, $p ** < .01$, $p * < .05$

3.7 Calibration (Hypothesis Four)

The next set of analyses examined the question of absolute risk, specifically, what rates of recidivism are associated with scores on the VRS-YV, SAVRY, and PCL: YV. The analyses examined these using three approaches: 1) survival analysis of risk bands or established cut scores for each of the measures examining trajectories of recidivism over time; 2) chi square analysis (including Cramer's V as a measure of effect size) examining rates of recidivism employing fixed follow-ups for the categories; and 3) logistic regression, using a logistic function to link the regression coefficients generated by test scores to estimated rates of recidivism associated with specific scores over a defined fixed follow-up. These will each be described in turn.

The survival charts are presented for each set of analyses, with log rank chi square pairwise comparisons reported in tabular form immediately below each chart. First, VRS-YV pretreatment total scores were arranged into low (0-34), medium (35-49), and high (50-69) risk bands based on Stockdale et al. (2014). As seen in Figure 3.1 and its accompanying table (table 3.15), the high risk and medium risk groups of youth had significantly faster and higher rates of any recidivism compared to the low risk group, but the medium risk group and high risk group did not differ. When examined as a function of ancestry, there were no differences between any risk groups of Indigenous youth (Figure 3.2). Among non-Indigenous youth (Figure 3.3), the medium risk group recidivated at a higher rate than low risk youth, however, there were too few high risk non-Indigeous youth to conduct meaningful comparisons. As a function of gender, males (Figure 3.4) mirrored the total sample while female (Figure 3.5) high risk youth differed from low and medium risk, but low and medium risk did not differ. Looking at time to new violent conviction for the total sample (Figure 3.6), all three risk groups were significantly different from each other. Among Indigenous youth (Figure 3.7), the low risk group differed from the medium and high risk groups, but the medium and high risk groups did not differ. Among the non-Indigenous group, (Figure 3.8) there was no difference between low and medium risk, and although the high risk group was significantly different, there was only one individual in that group. The male (Figure 3.9) low risk group differed from the medium and high risk groups, but the medium and high risk groups did not significantly differ; however, for females (Figure 3.10), the high risk group differed from the low and medium risk groups, while the low and medium groups did not differ. Finally, looking at new non-violent conviction over

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time, the total sample (Figure 3.11) low risk group differed from the medium and high risk groups, but the medium and high risk groups did not differ. Among Indigenous youth, (Figure 3.12) there were no differences and the non-Indigenous youth (Figure 3.13) mirrored the total sample. The males (Figure 3.14) also mirrored the total sample, while the females (Figure 3.15) demonstrated the same pattern as above, with the high risk group differing from the low and medium risk groups, but the low and medium risk groups did not differ.

Second, the SAVRY risk applied at coding were arranged into three groups, low (0), medium (1-3), and high (4). When the data were entered, five categories were created to allow for placement in two additional categories (low-medium or medium-high), based on the risk factors and protective factors coded. However, as there are only three categories on the measure, all groups coded with medium (i.e., low-medium, medium, and medium-high) were collapsed to create the medium risk-band for the purpose of these analyses. As seen in Figure 3.16, the high risk group had significantly faster and higher rates of any recidivism compared with the low and medium risk groups, and the medium risk group had higher and faster rates than the low risk group. Among Indigenous youth, (Figure 3.17) the high risk group differed from the low and medium risk groups, but the low and medium risk groups did not differ; by contrast, the non-Indigenous youth groups (Figure 3.18) were all significantly different. The male groups (Figure 3.19) were also all significantly different while the female groups (Figure 3.20) had no significant differences. Looking at new violent convictions over time, the total sample groups (Figure 3.21) were again all significantly different. Indigenous youth groups (Figure 3.22) were also all significantly different, but the non-Indigenous youth (Figure 3.23) only differed between the low and high risk groups. Again, the male groups (Figure 3.24) were all significantly different and the female groups (Figure 3.25) had no significant differences in risk bands on the SAVRY (Figure 3.25). As with above, for time to new non-violent conviction, the total sample groups were all significantly different (Figure 3.26). High risk Indigenous youth differed from low and medium risk, but low and medium risk did not differ (Figure 3.27) while all non-Indigenous youth groups were significantly different (Figure 3.28). Male (Figure 3.29) and female (Figure 3.30) groups evidenced the same pattern as above, with male groups being all significantly different and female groups having no significant difference.

Finally, the PCL-YV was arranged into three risk bands, low (0-14), medium (15-24), and high (25-40). For the total sample, as seen in Figure 3.31, the high risk group had

significantly higher and faster rates for any recidivism than the medium or low risk group and the medium risk group also had higher and faster rates of any recidivism compared to the low risk group. Among both the Indigenous youth (Figure 3.32) and the non-Indigenous youth (Figure 3.33), only the high and low risk groups differed. For males (Figure 3.34), the low risk group differed from the medium and high risk group but the medium and high risk groups did not differ while for females (Figure 3.35) only the medium and high risk groups differed. Looking at violent recidivism, the total sample (Figure 3.36) low risk group differed from the medium and high risk groups, but the medium and high risk groups did not differ. Indigenous youth (Figure 3.37) demonstrated the same pattern while non-Indigenous youth groups (Figure 3.38) had no significant differences. Male groups (Figure 3.39) demonstrated the same pattern as the total sample while the only difference for female groups was between the low and high risk group (Figure 3.40). Finally, for non-violent recidivism, the total sample (Figure 3.41) had significant differences between all three groups. Among the Indigenous youth (Figure 3.42) there were no differences in recidivism trajectories between groups and the non-Indigenous groups (Figure 3.43) only differed between low and high risk. The male (Figure 3.44) low risk group differed from the medium and high risk groups, but the medium and high risk groups did not differ, while only the female (Figure 3.45) medium and high risk groups differed.

Figure 3.1

Survival Analysis: Rates of Any New Conviction Over Time for VRS-YV Risk Groups (Total Sample)
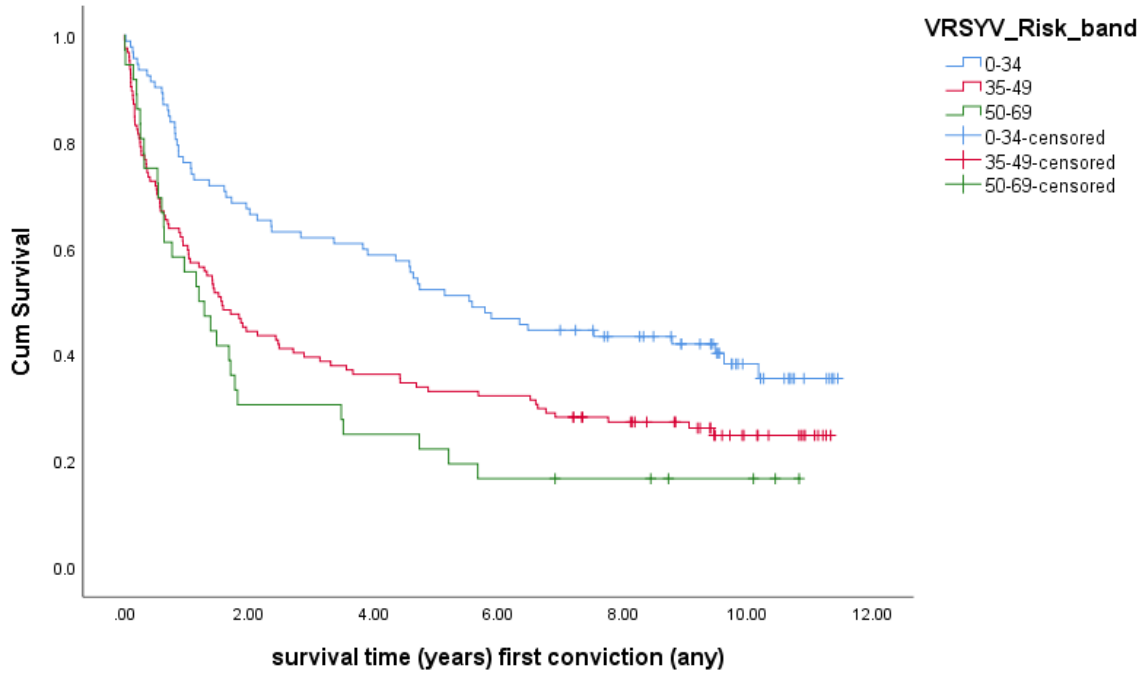

Table 3.15

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, *n* = 92)	Medium (35-49, *n* = 124)
Medium (35-49, *n* = 124)	8.50**	-
High (50-69, *n* = 36)	12.93***	1.35

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.2

Survival Analysis: Rates of Any New Conviction Over Time for VRS-YV Risk Groups (Indigenous Youth)

Table 3.16

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Conviction (Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 49$)	Medium (35-49, $n = 89$)
Medium (35-49, $n = 89$)	1.64	-
High (50-69, $n = 33$)	3.55	0.76

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.3

Survival Analysis: Rates of Any New Conviction Over Time for VRS-YV Risk Groups (Non-Indigenous Youth)
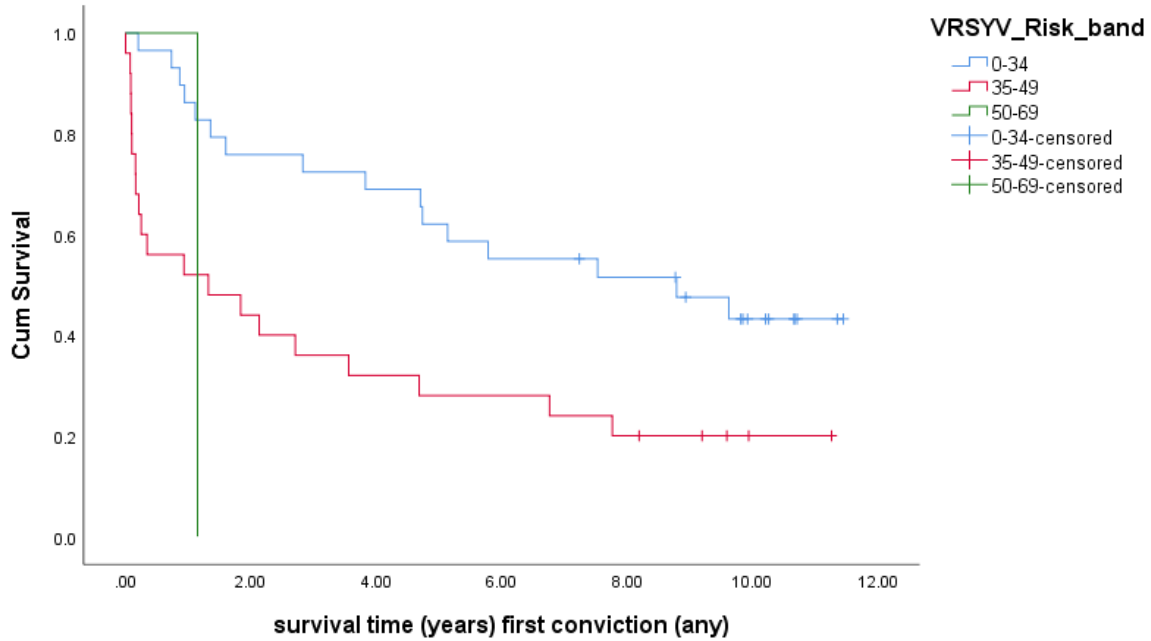
Table 3.17

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 29$)	Medium (35-49, $n = 25$)
Medium (35-49, $n = 25$)	7.88**	-
High (50-69, $n = 1$)	2.89	0.17

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.4

Survival Analysis: Rates of Any New Conviction Over Time for VRS-YV Risk Groups (Male Youth)
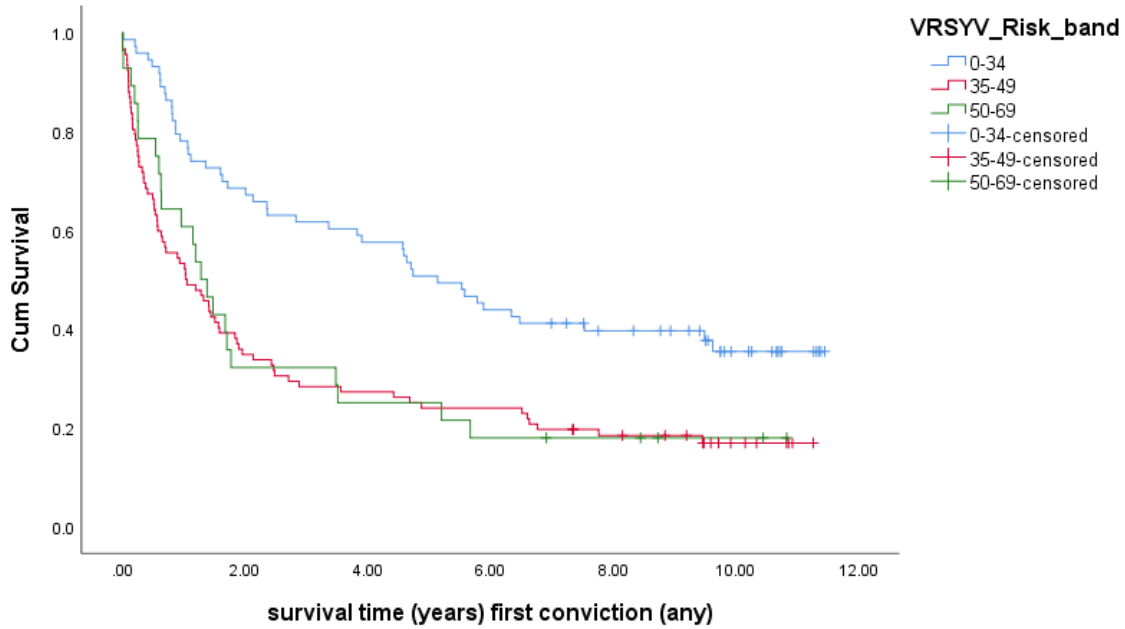
Table 3.18
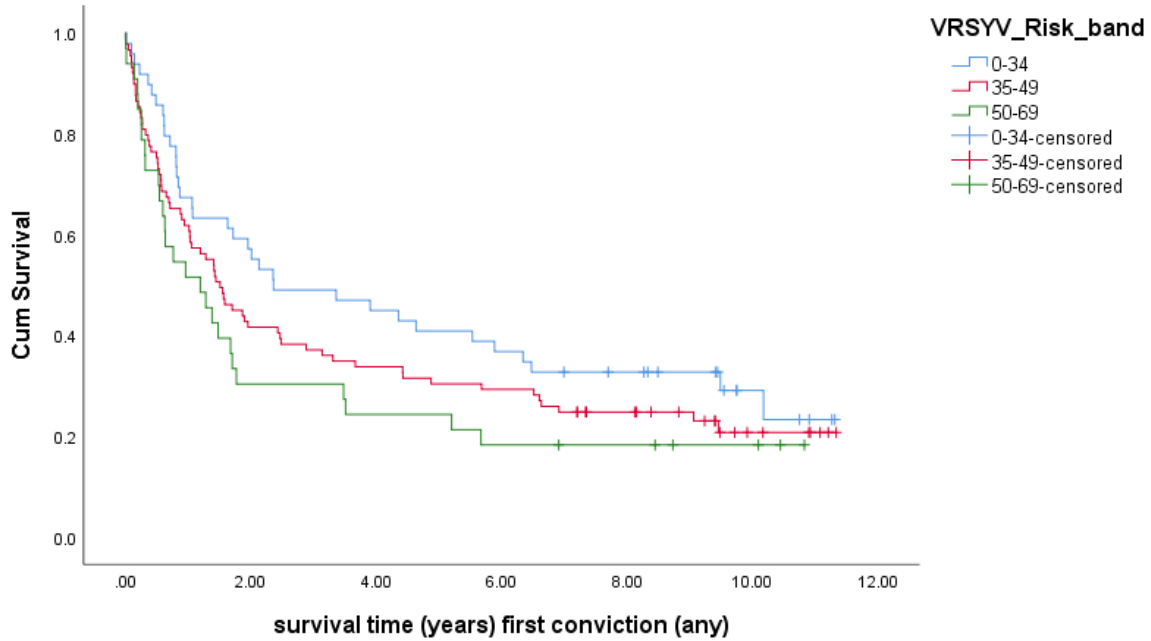
Log Rank Chi Square Pairwise Comparison VRS-YV Any New Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 73$)	Medium (35-49, $n = 92$)
Medium (35-49, $n = 92$)	15.86***	-
High (50-69, $n = 28$)	8.44**	.05

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.5

*Survival Analysis: Rates of Any New Conviction Over Time for VRS-YV Risk Groups (Female Youth)*
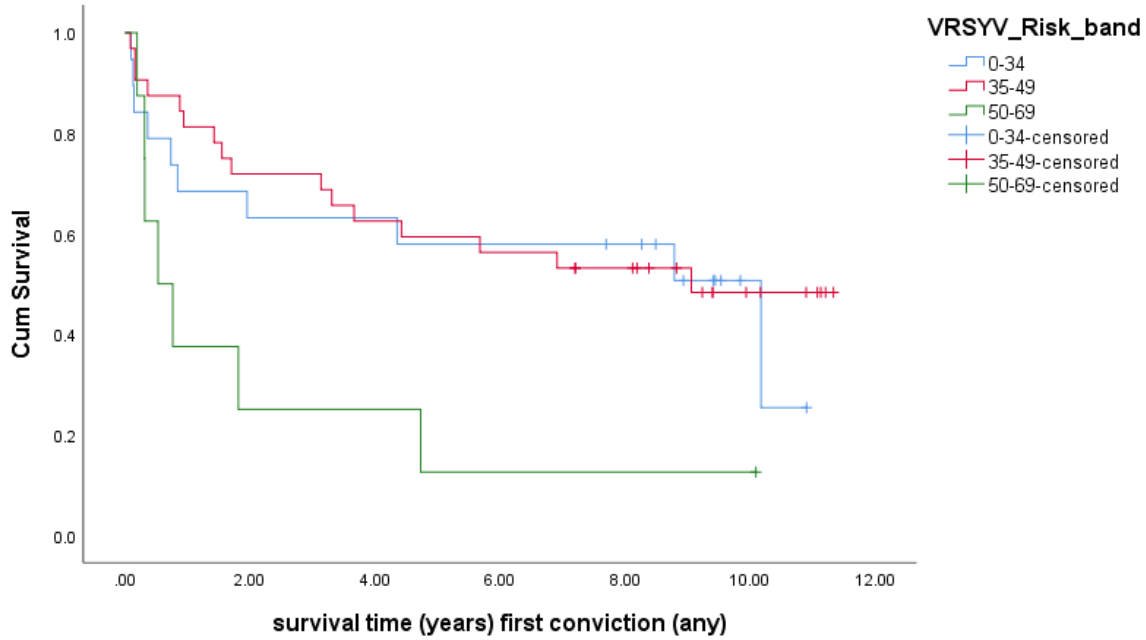
Table 3.19

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 19$)	Medium (35-49, $n = 32$)
Medium (35-49, $n = 32$)	0.12	-
High (50-69, $n = 8$)	4.07*	6.96**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.6

Survival Analysis: Rates of Any New Violent Conviction Over Time for VRS-YV Risk Groups

(Total Sample)

Table 3.20

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Violent Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 92$)	Medium (35-49, $n = 124$)
Medium (35-49, $n = 124$)	7.40**	-
High (50-69, $n = 36$)	14.54***	3.87*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.7

*Survival Snalysis: Rates of Any New Violent Conviction Over Time for VRS-YV Risk Groups (Indigenous Youth)*
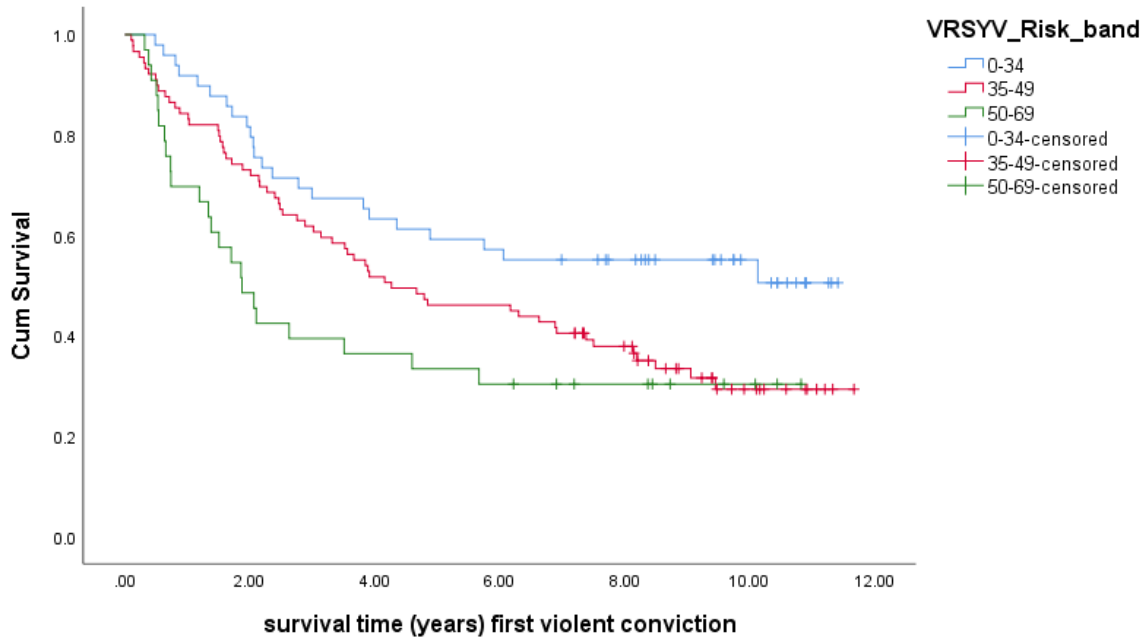
Table 3.21

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Violent Conviction (Indigenous Youth)

| | Pairwise comparison (log rank χ^2) reference group | |
VRS-YV risk band	Low (0-34, $n = 49$)	Medium (35-49, $n = 89$)
Medium (35-49, $n = 89$)	4.79*	-
High (50-69, $n = 33$)	7.71**	1.63

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.8

*Survival Analysis: Rates of Any New Violent Conviction Over Time for VRS-YV Risk Groups*

(Non-Indigenous Youth)

Table 3.22

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Violent Conviction (Non-

Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 29$)	Medium (35-49, $n = 25$)
Medium (35-49, $n = 25$)	0.97	-
High (50-69, $n = 1$)	5.45*	11.27**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.9

Survival Analysis: Rates of Any New Violent Conviction Over Time for VRS-YV Risk Groups (Male Youth)

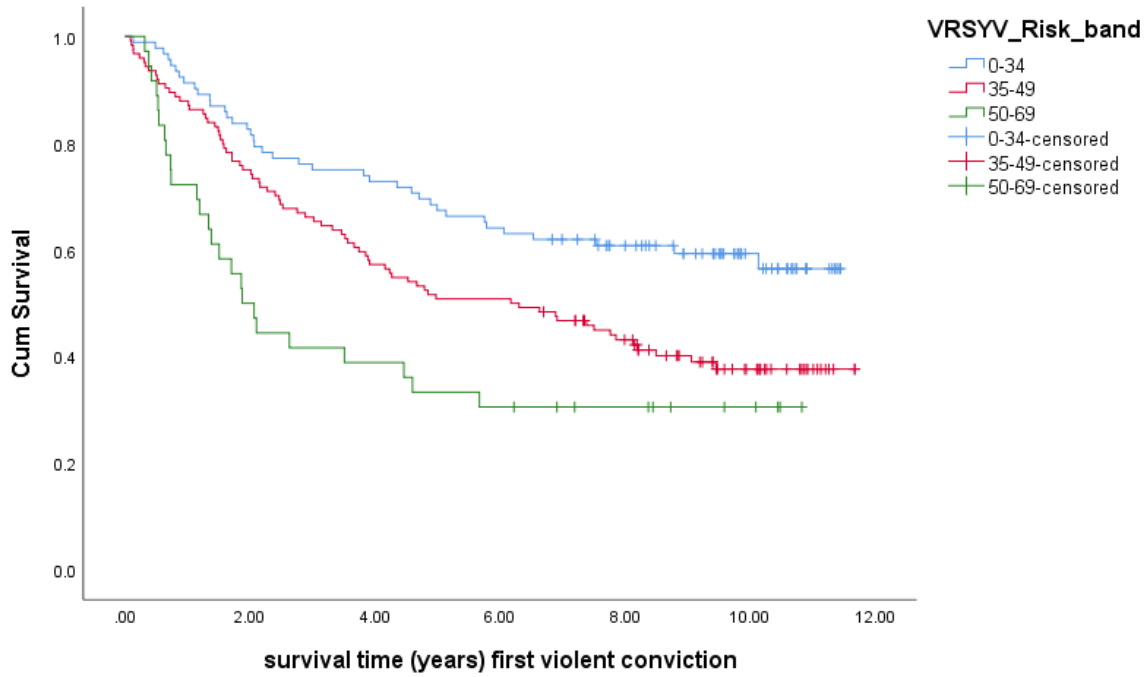Table 3.23

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Violent Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 73$)	Medium (35-49, $n = 92$)
Medium (35-49, $n = 92$)	9.61**	-
High (50-69, $n = 28$)	8.83**	0.72

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.10

*Survival Analysis: Rates of Any New Violent Conviction Over Time for VRS-YV Risk Groups (Female Youth)*
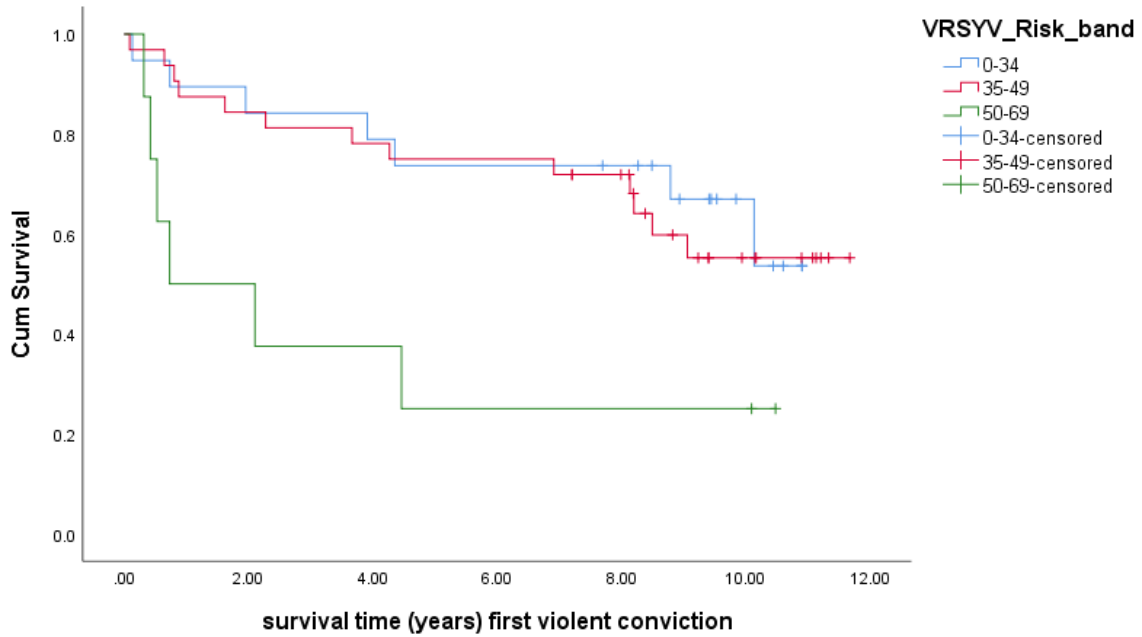
Table 3.24

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Violent Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 19$)	Medium (35-49, $n = 32$)
Medium (35-49, $n = 32$)	0.12	-
High (50-69, $n = 8$)	4.97*	5.83*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.11

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for VRS-YV Risk Groups (Total Sample)

Table 3.25

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Non-violent Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 92$)	Medium (35-49, $n = 124$)
Medium (35-49, $n = 124$)	9.11**	-
High (50-69, $n = 36$)	13.97***	1.53

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.12

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for VRS-YV Risk Groups
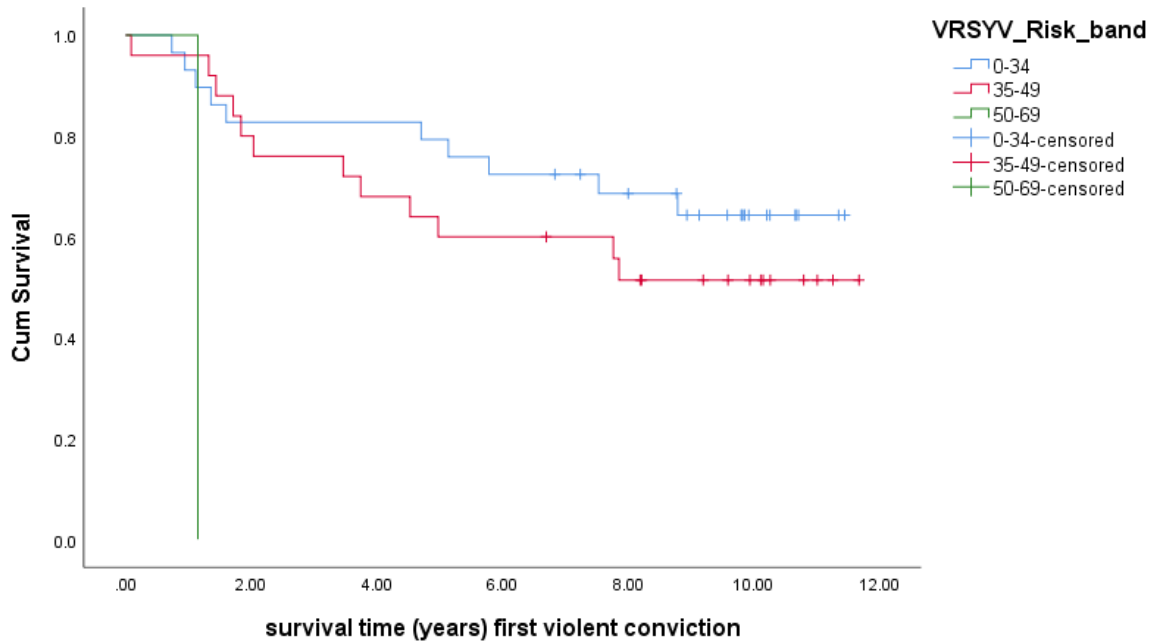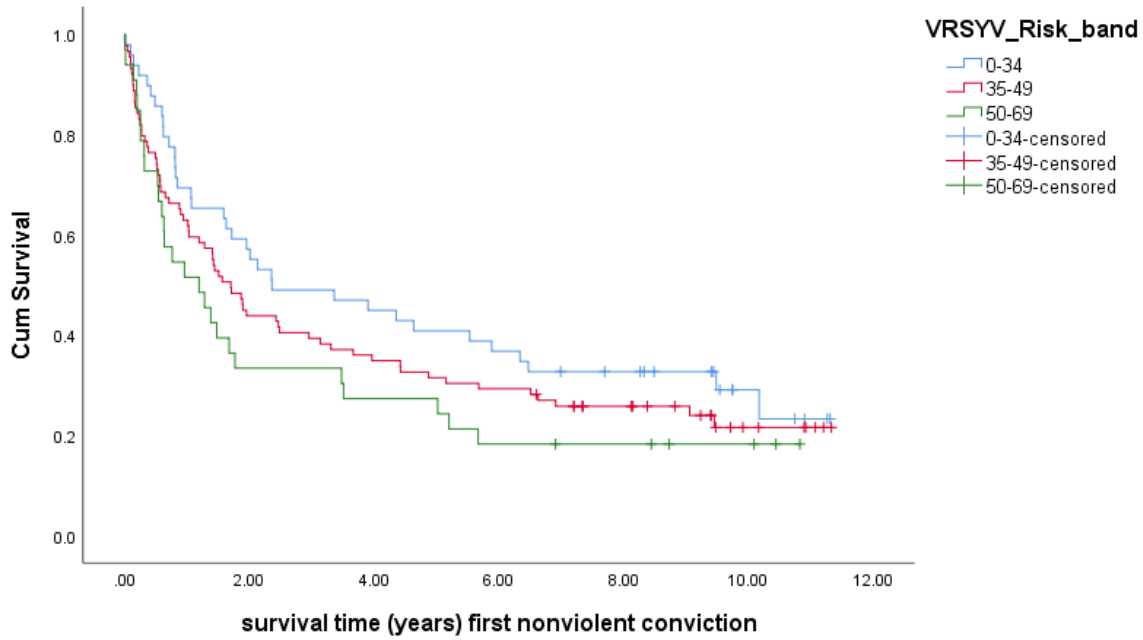
(Indigenous Youth)

Table 3.26

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Non-violent Conviction

(Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 49$)	Medium (35-49, $n = 89$)
Medium (35-49, $n = 89$)	1.33	-
High (50-69, $n = 33$)	3.34	0.87

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.13

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for VRS-YV Risk Groups (Non-Indigenous Youth)
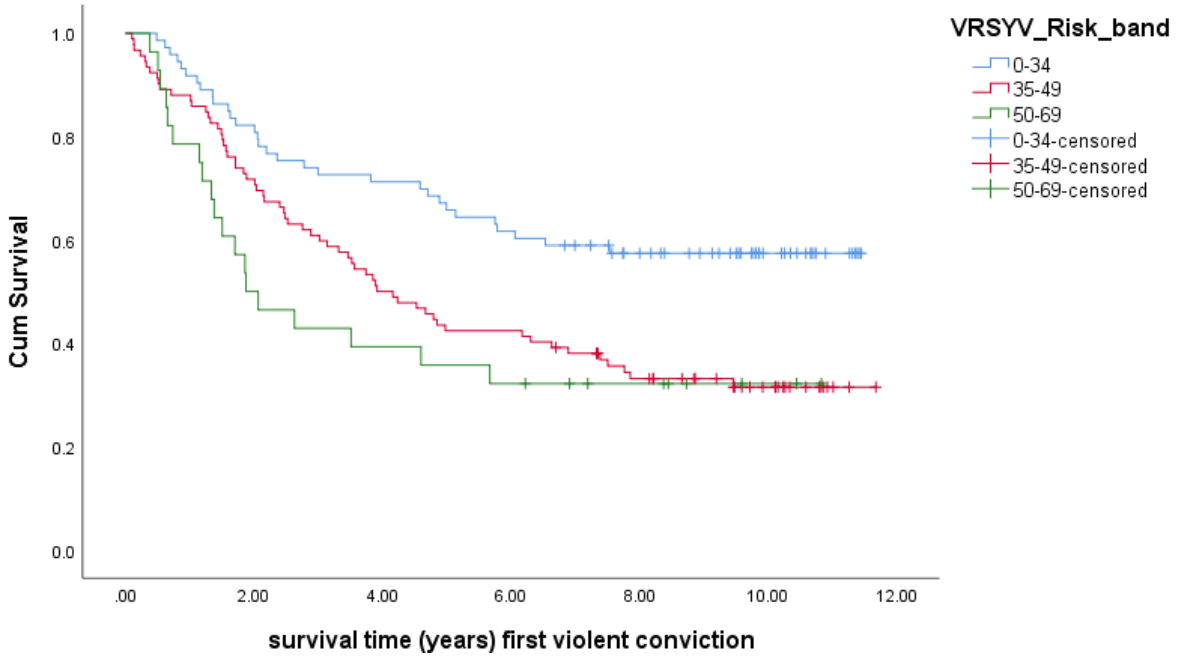

Table 3.27

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Non-violent Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 29$)	Medium (35-49, $n = 25$)
Medium (35-49, $n = 25$)	9.29**	-
High (50-69, $n = 1$)	3.91*	0.17

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.14

*Survival Analysis: Rates of Any New Non-violent Conviction Over Time for VRS-YV Risk Groups (Male Youth)*

Table 3.28

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Non-violent Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 73$)	Medium (35-49, $n = 92$)
Medium (35-49, $n = 92$)	15.73***	-
High (50-69, $n = 28$)	9.16**	.02

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.15

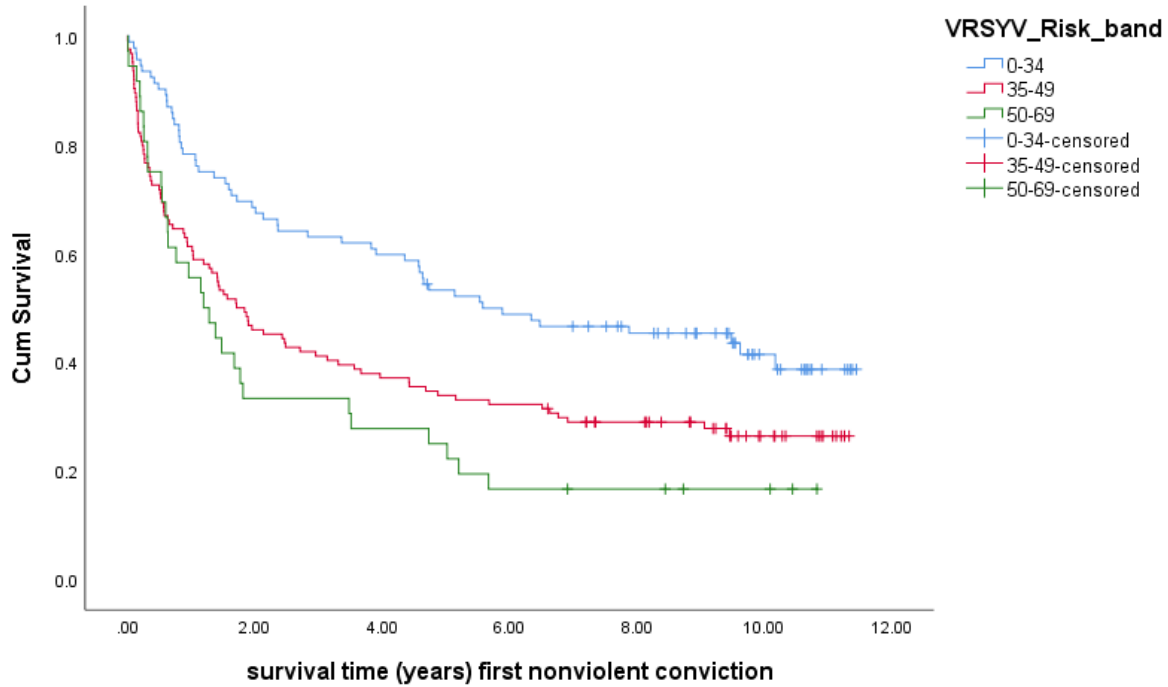*Survival Analysis: Rates of Any New Non-violent Conviction Over Time for VRS-YV Risk Groups (Female Youth)*
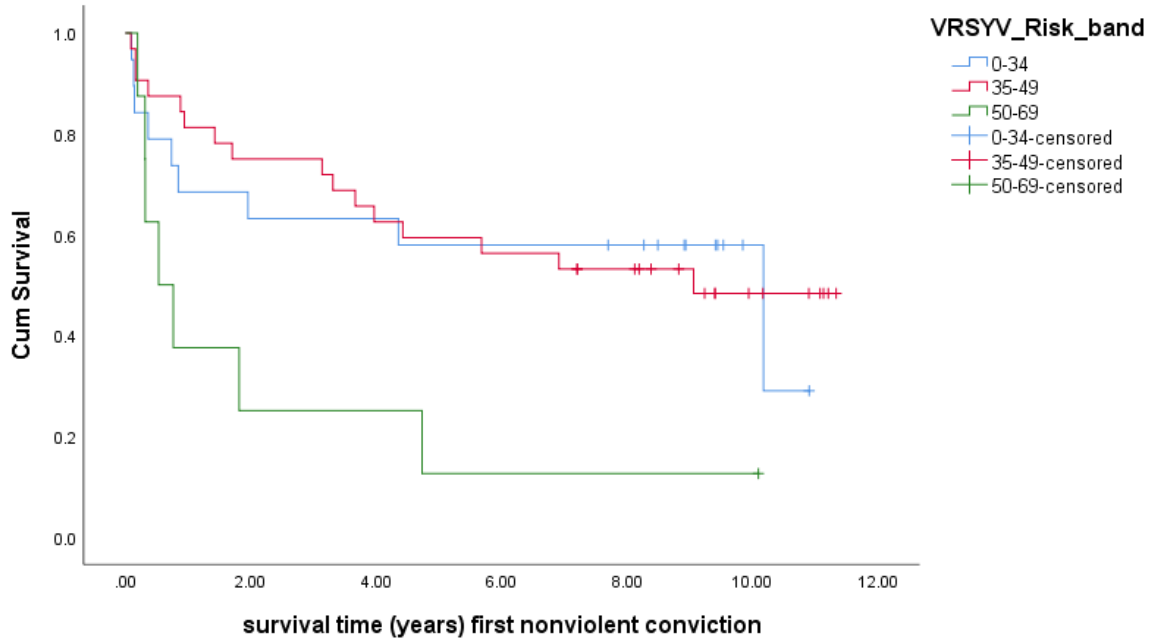
Table 3.29

Log Rank Chi Square Pairwise Comparison VRS-YV Any New Non-violent Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
VRS-YV risk band	Low (0-34, $n = 19$)	Medium (35-49, $n = 32$)
Medium (35-49, $n = 32$)	0.01	-
High (50-69, $n = 8$)	4.50*	7.18**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.16

Survival Analysis: Rates of Any New Conviction Over Time for SAVRY Risk Groups (Total Sample)

Table 3.30

Log Rank Chi Square Pairwise Comparison Any New Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 36$)	Medium (1-3, $n = 119$)
Medium (1-3, $n = 119$)	8.87**	-
High (4, $n = 97$)	30.34***	14.16***

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.17

*Survival Analysis: Rates of Any New Conviction Over Time for SAVRY Risk Groups (Indigenous Youth)*

Table 3.31

Log Rank Chi Square Pairwise Comparison SAVRY Any New Conviction (Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 11$)	Medium (1-3, $n = 78$)
Medium (1-3, $n = 78$)	0.99	-
High (4, $n = 82$)	4.68*	6.71**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.18

Survival Analysis: Rates of Any New Conviction Over Time for SAVRY Risk Groups (Non-Indigenous Youth)

Table 3.32
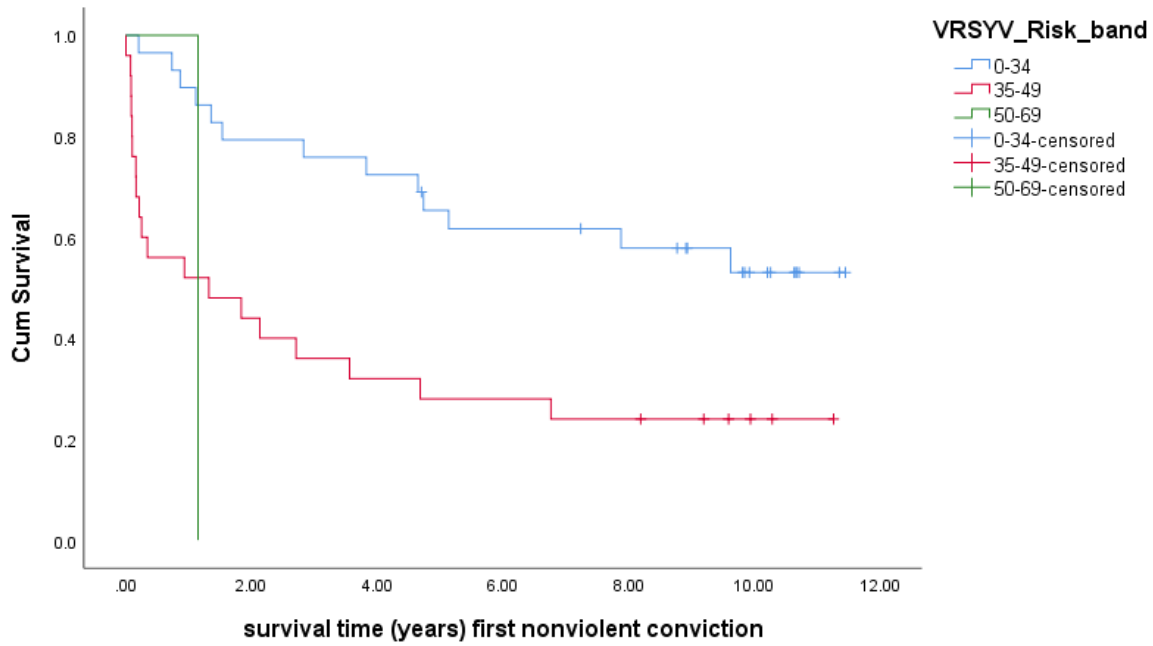
Log Rank Chi Square Pairwise Comparison SAVRY Any New Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 17$)	Medium (1-3, $n = 29$)
Medium (1-3, $n = 29$)	6.86**	-
High (4, $n = 9$)	28.30***	4.70*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.19

Survival Analysis: Rates of Any New Conviction Over Time for SAVRY Risk Groups (Male Youth)

Table 3.33

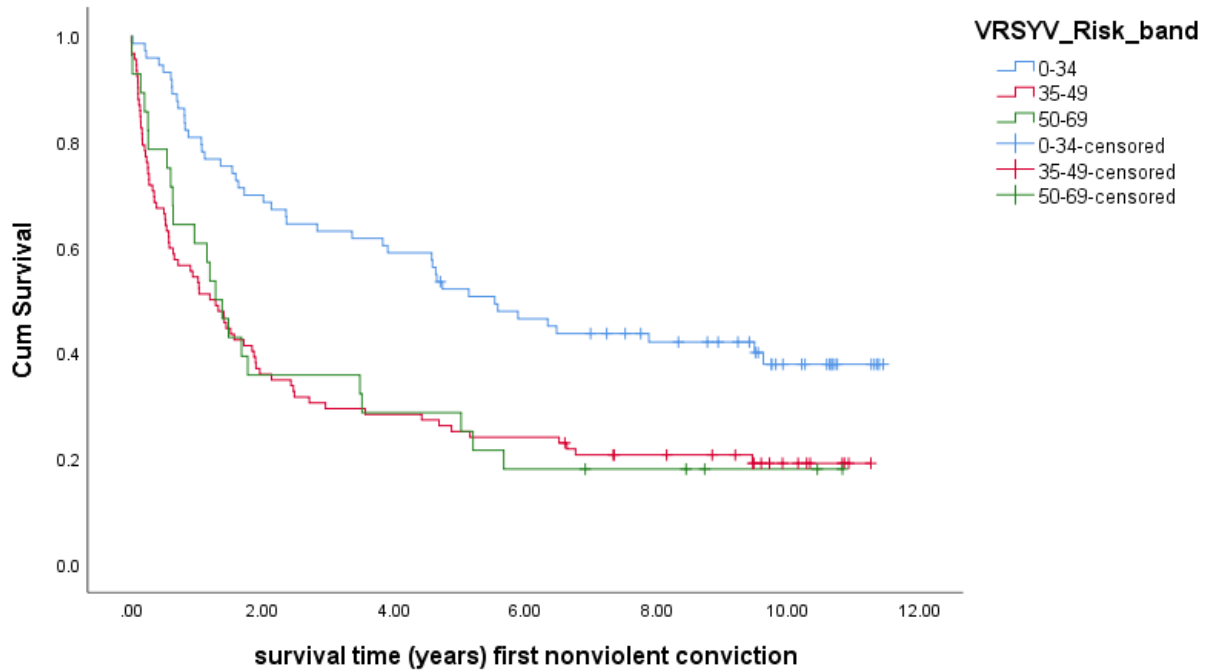*Log Rank Chi Square Pairwise Comparison SAVRY Any New Conviction (Male Youth)*

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 34$)	Medium (1-3, $n = 85$)
Medium (1-3, $n = 86$)	11.06**	-
High (4, $n = 74$)	36.48***	11.39**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.20

Survival Analysis: Rates of Any New Conviction Over Time for SAVRY Risk Groups (Female Youth)

Table 3.34

Log Rank Chi Square Pairwise Comparison SAVRY Any New Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 2$)	Medium (1-3, $n = 34$)
Medium (1-3, $n = 34$)	1.56	-
High (4, $n = 23$)	2.31	2.12

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.21

*Survival Analysis: Rates of Any New Violent Conviction Over Time for SAVRY Risk Groups (Total Sample)*
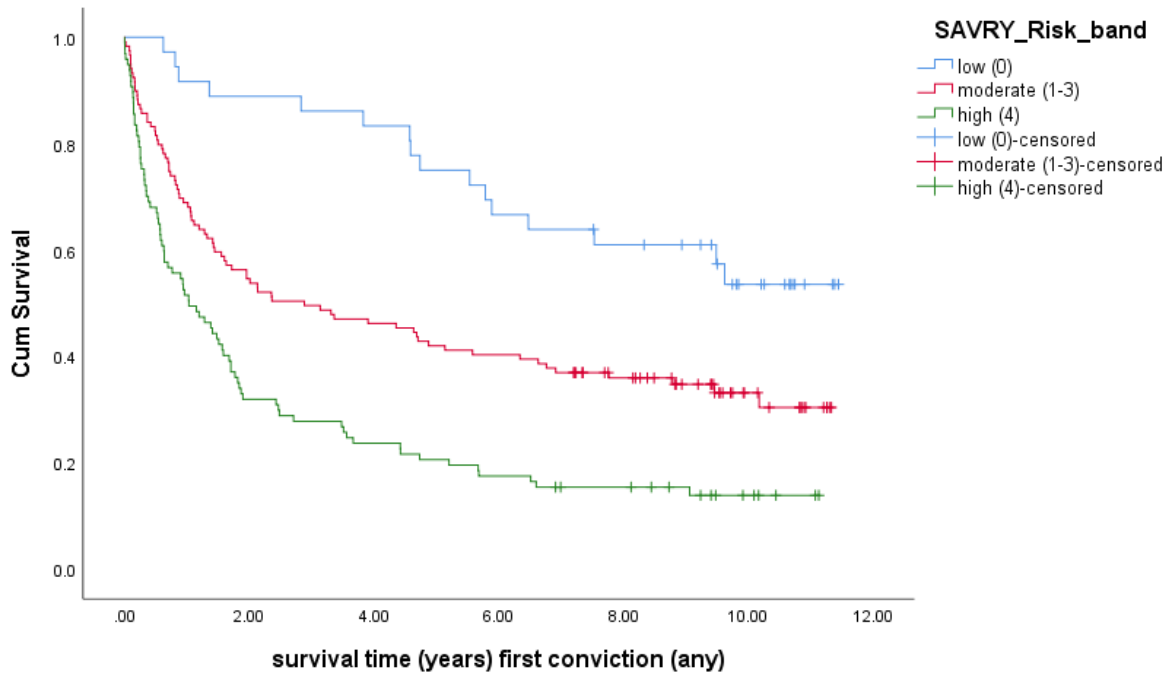

Table 3.35

Log Rank Chi Square Pairwise Comparison SAVRY Any New Violent Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 36$)	Medium (1-3, $n = 119$)
Medium (1-3, $n = 119$)	10.80**	-
High (4, $n = 97$)	25.70***	10.73**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.22

Survival Analysis: Rates of Any New Violent Conviction Over Time for SAVRY Risk Groups (Indigenous Youth)
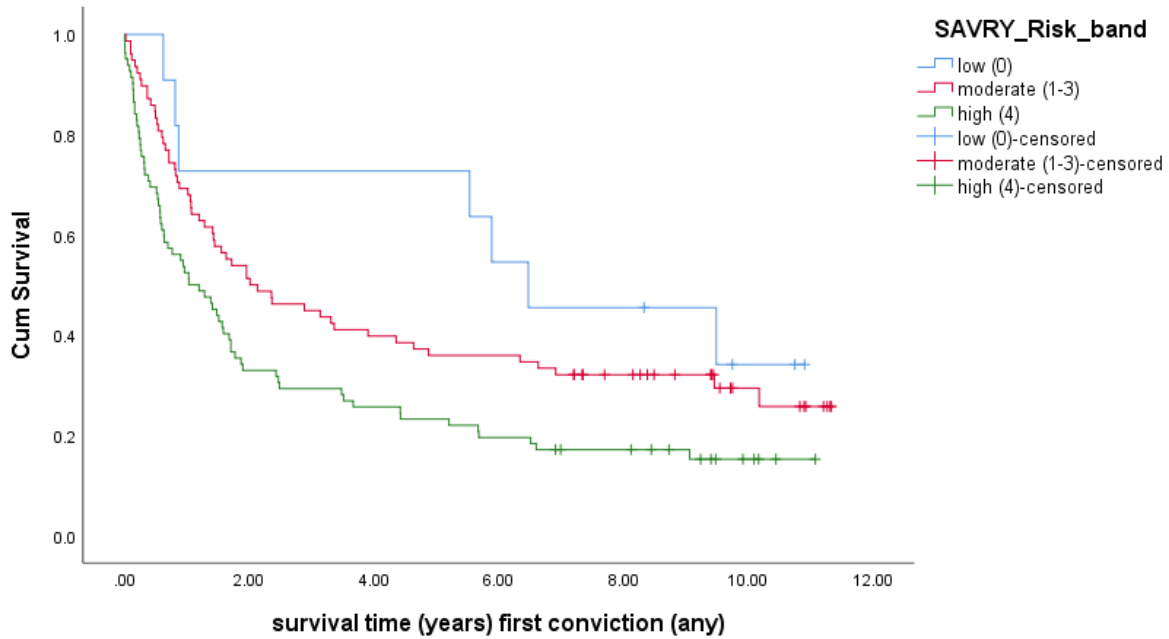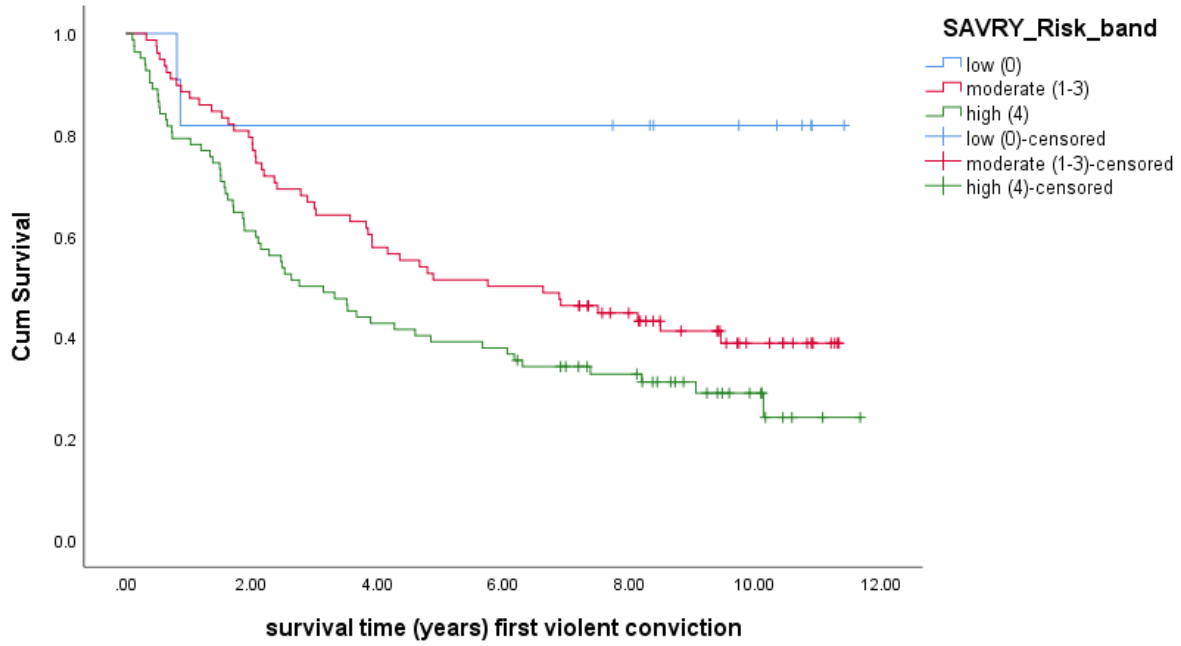

Table 3.36

Log Rank Chi Square Pairwise Comparison SAVRY Any New Violent Conviction (Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 11$)	Medium (1-3, $n = 78$)
Medium (1-3, $n = 78$)	4.49*	-
High (4, $n = 82$)	7.84**	4.28*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.23

Survival Analysis: Rates of Any New Violent Conviction Over Time for SAVRY Risk Groups
(Non-Indigenous Youth)
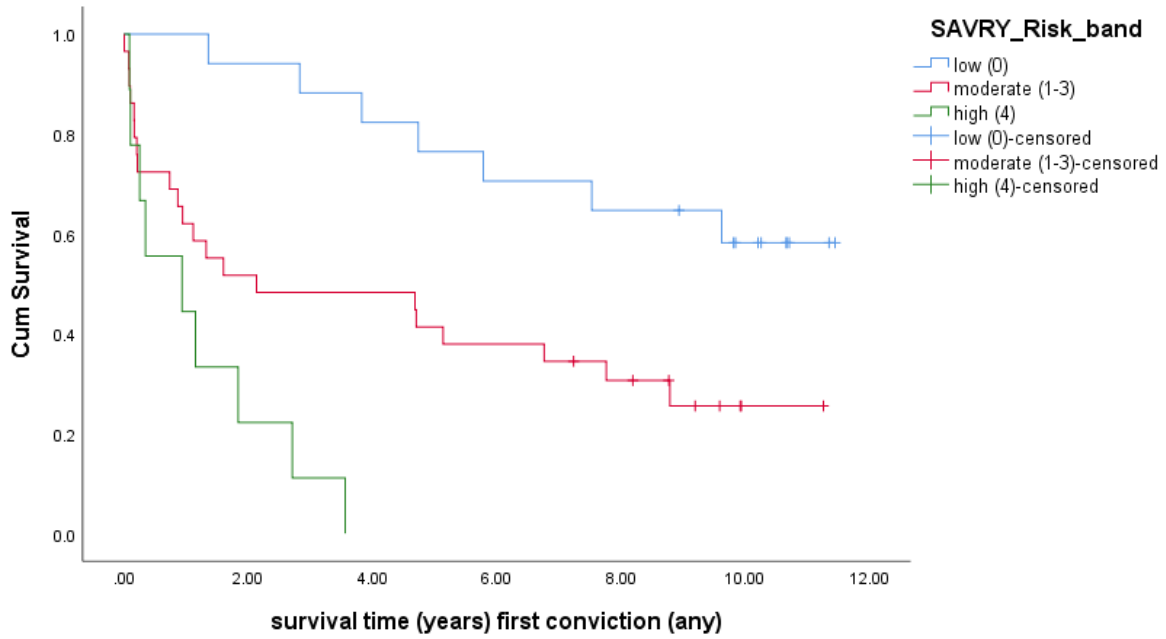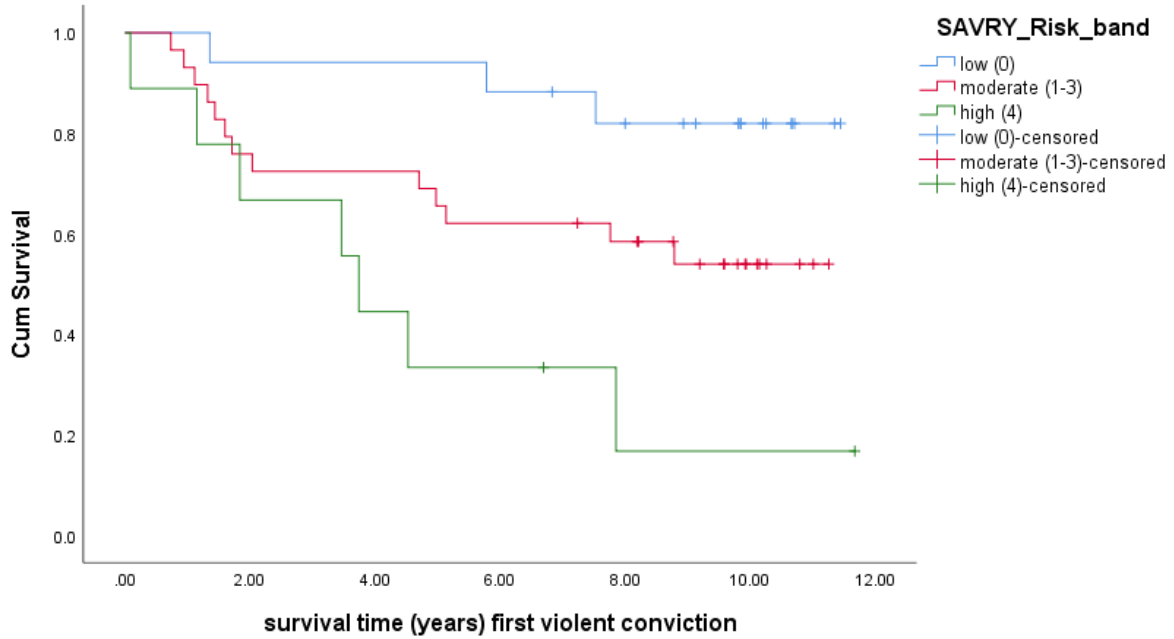

Table 3.37

Log Rank Chi Square Pairwise Comparison SAVRY Any New Violent Conviction (Non-
Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 17$)	Medium (1-3, $n = 29$)
Medium (1-3, $n = 29$)	3.76	-
High (4, $n = 9$)	12.08**	3.56

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.24

Survival Analysis: Rates of Any New Violent Conviction Over Time for SAVRY Risk Groups
(Male Youth)

Table 3.38

Log Rank Chi Square Pairwise Comparison SAVRY Any New Violent Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 34$)	Medium (1-3, $n = 85$)
Medium (1-3, $n = 85$)	12.88***	-
High (4, $n = 74$)	25.83***	6.56**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.25

Survival Analysis: Rates of Any New Violent Conviction Over Time for SAVRY Risk Groups (Female Youth)
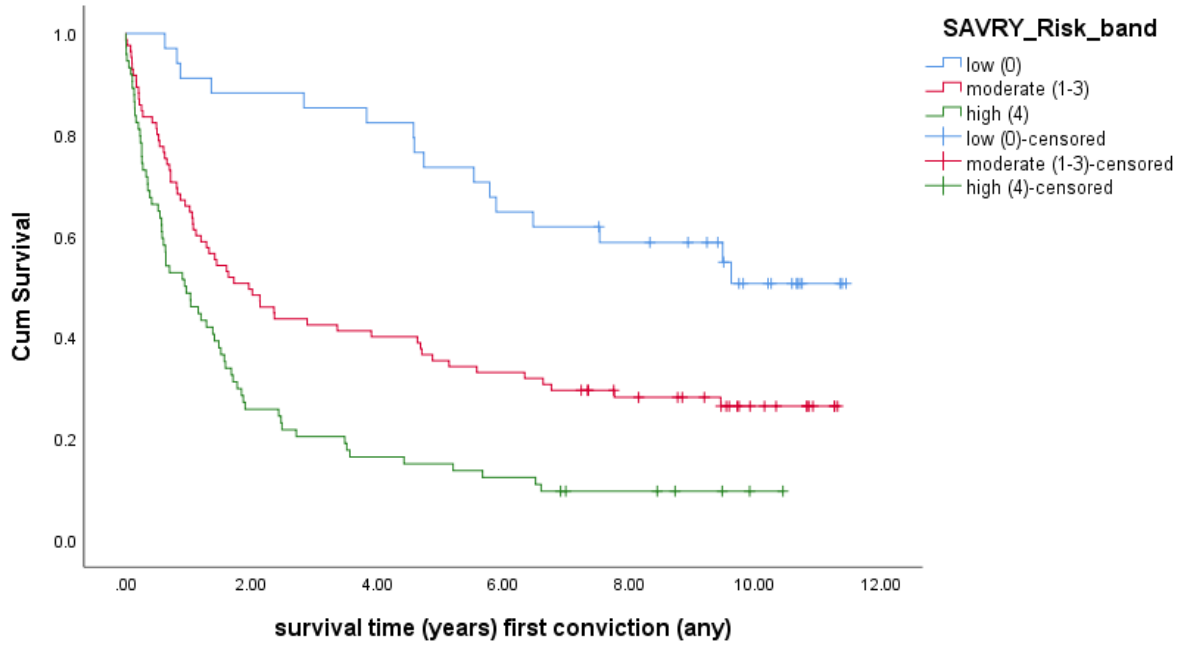

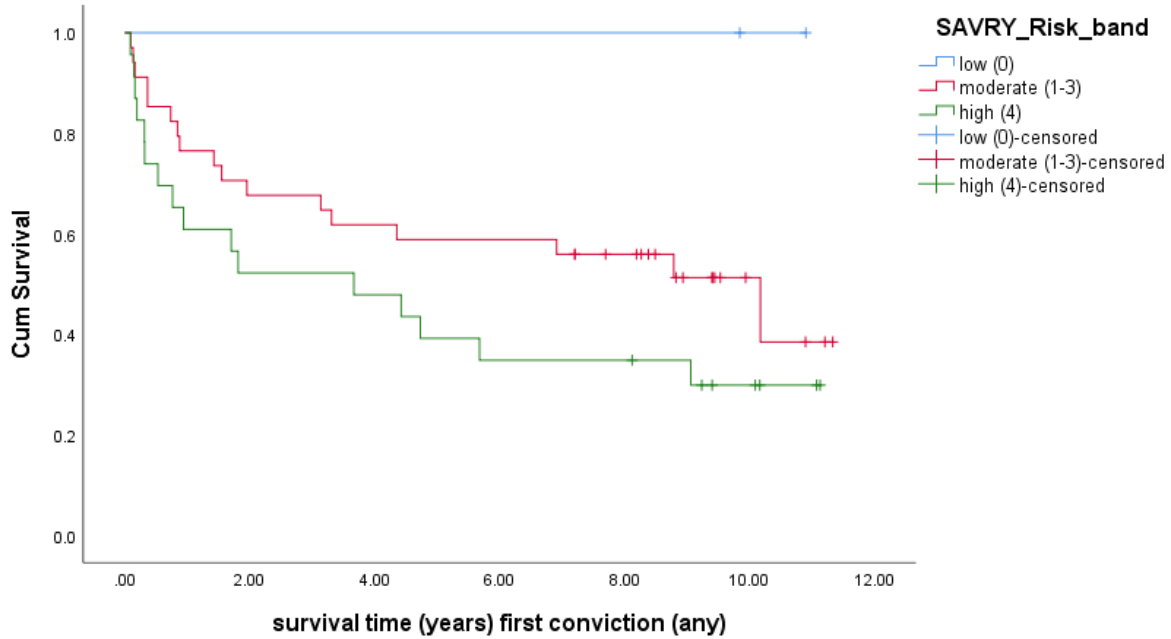Table 3.39

Log Rank Chi Square Pairwise Comparison SAVRY Any New Violent Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 2$)	Medium (1-3, $n = 34$)
Medium (1-3, $n = 34$)	0.96	-
High (4, $n = 23$)	1.81	3.05

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.26

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for SAVRY Risk Groups (Total Sample)
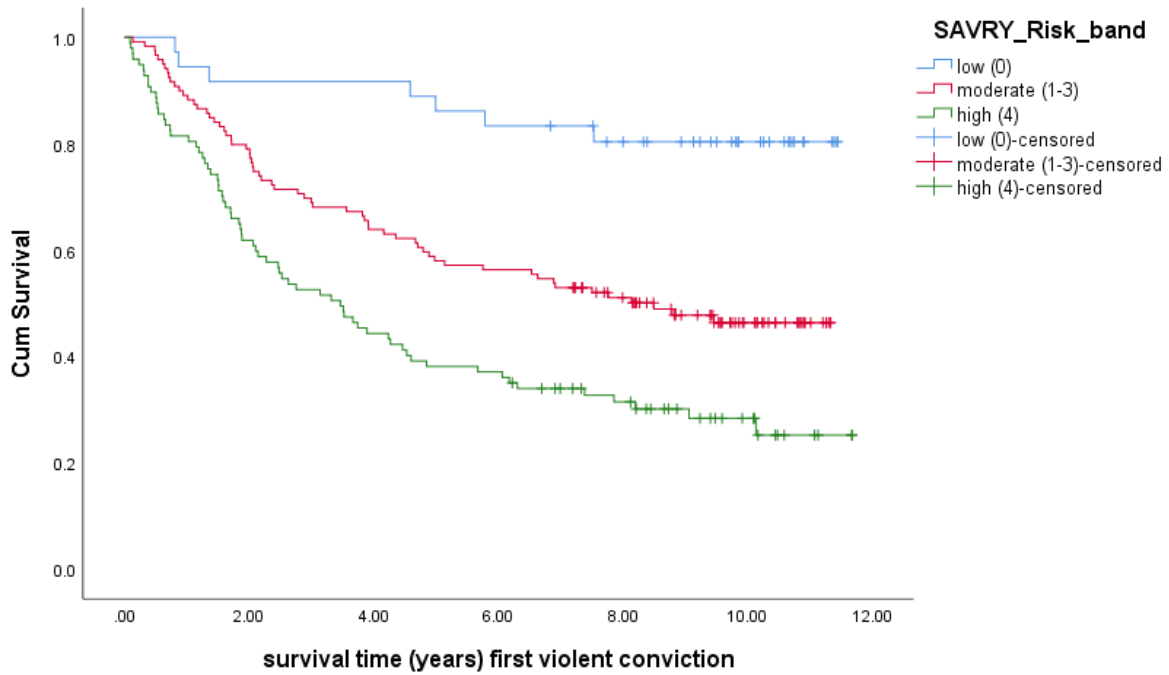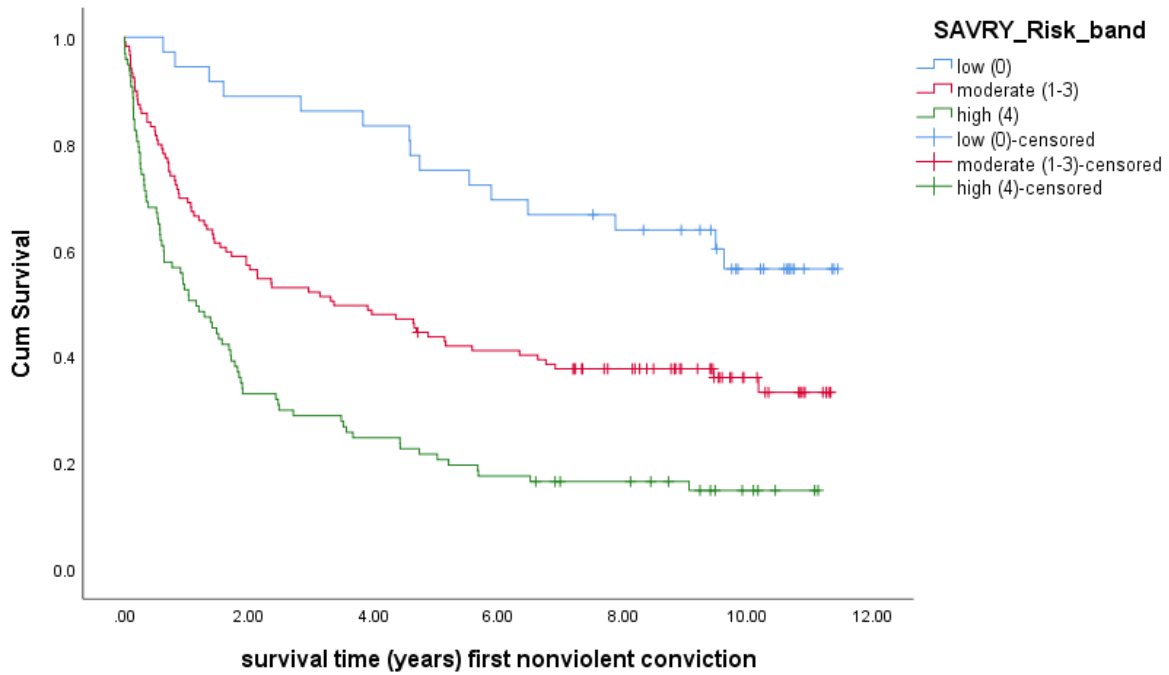

Table 3.40

Log Rank Chi Square Pairwise Comparison SAVRY Any New Non-violent Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 36$)	Medium (1-3, $n = 119$)
Medium (1-3, $n = 119$)	8.73**	-
High (4, $n = 97$)	30.80***	15.14***

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.27

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for SAVRY Risk Groups
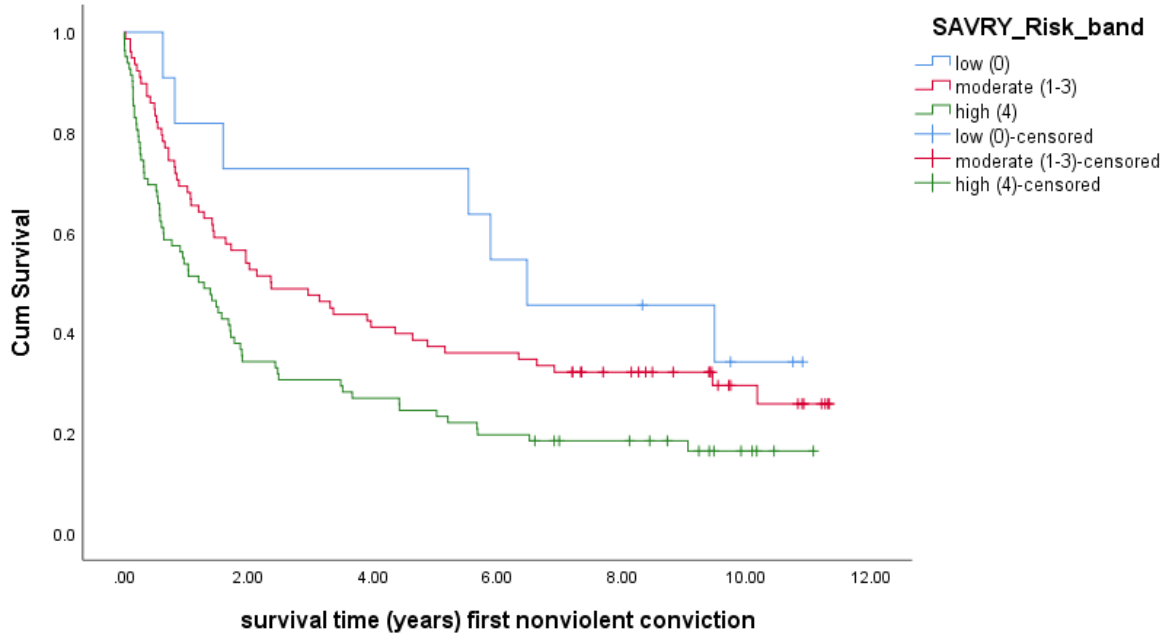
(Indigenous Youth)

Table 3.41

Log Rank Chi Square Pairwise Comparison SAVRY Any New Non-violent Conviction

(Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 11$)	Medium (1-3, $n = 78$)
Medium (1-3, $n = 78$)	1.08	-
High (4, $n = 82$)	4.67*	6.29*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.28

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for SAVRY Risk Groups (Non-Indigenous Youth)

Table 3.42

Log Rank Chi Square Pairwise Comparison SAVRY Any New Non-violent Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 17$)	Medium (1-3, $n = 29$)
Medium (1-3, $n = 29$)	5.14*	-
High (4, $n = 9$)	28.28***	5.50*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.29

*Survival Analysis: Rates of Any New Non-violent Conviction Over Time for SAVRY Risk Groups (Male Youth)*

Table 3.43

Log Rank Chi Square Pairwise Comparison SAVRY Any New Non-violent Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 34$)	Medium (1-3, $n = 85$)
Medium (1-3, $n = 85$)	10.98**	-
High (4, $n = 74$)	36.18***	11.60**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.30

*Survival Analysis: Rates of Any New Non-violent Conviction Over Time for SAVRY Risk Groups (Female Youth)*
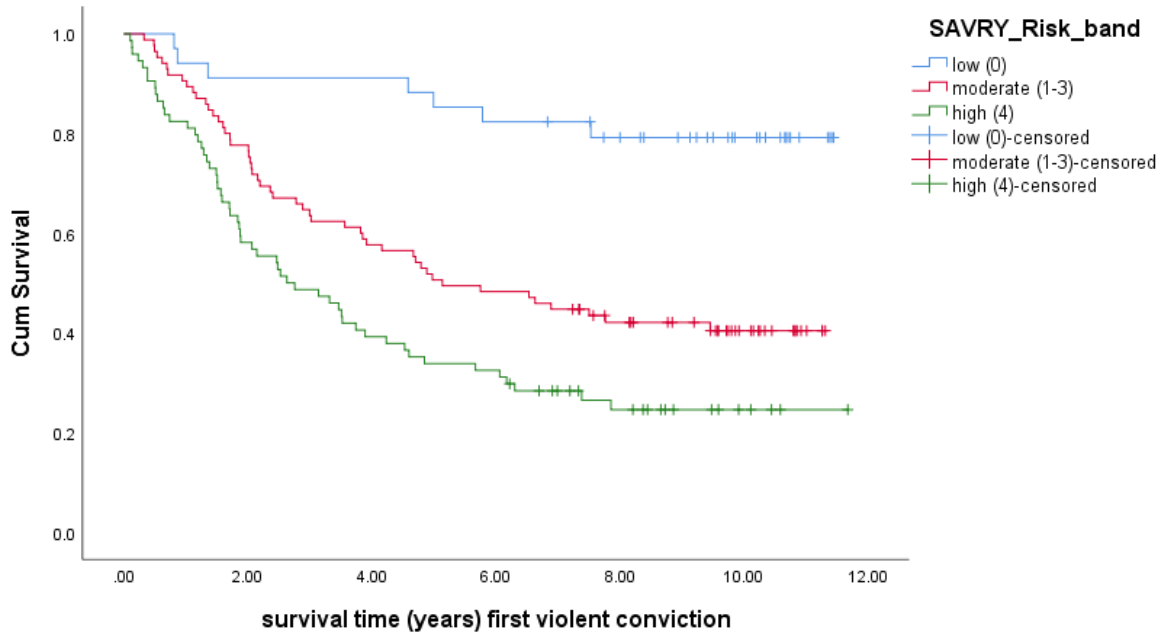

Table 3.44

Log Rank Chi Square Pairwise Comparison SAVRY Any New Non-violent Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
SAVRY risk band	Low (0, $n = 2$)	Medium (1-3, $n = 34$)
Medium (1-3, $n = 34$)	1.39	-
High (4, $n = 23$)	2.31	2.71

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.31

Survival Analysis: Rates of Any New Conviction Over Time for PCL: YV Risk Groups (Total Sample)
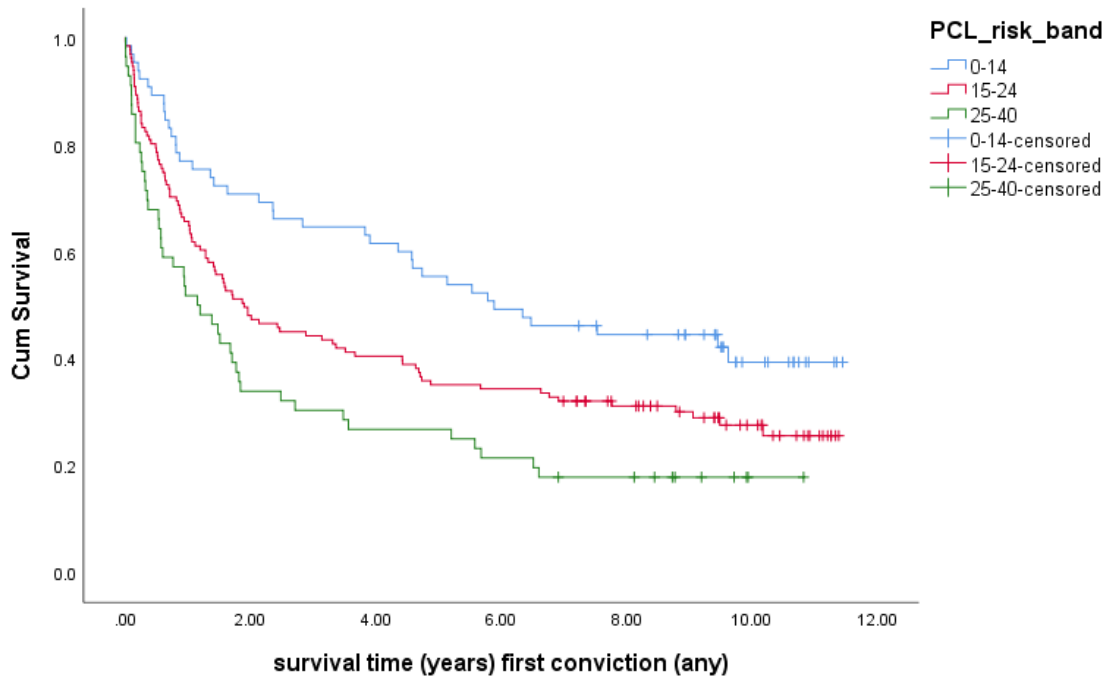
Table 3.45

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 65$)	Medium (15-24, $n = 131$)
Medium (15-24, $n = 131$)	5.46*	-
High (25-40, $n = 56$)	14.09***	4.18*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.32

Survival Analysis: Rates of Any New Conviction Over Time for PCL: YV Risk Groups
(Indigenous Youth)
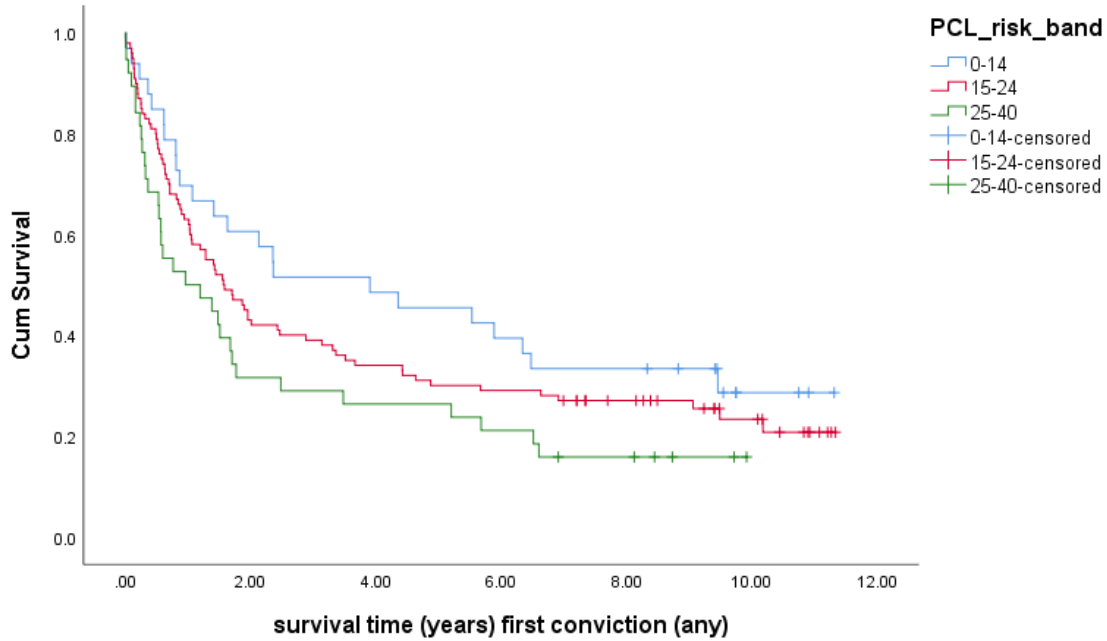
Table 3.46

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Conviction (Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, *n* = 33)	Medium (15-24, *n* = 100)
Medium (15-24, *n* = 100)	1.18	-
High (25-40, *n* = 38)	4.26*	2.29

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.33

Survival Analysis: Rates of Any New Conviction Over Time for PCL: YV Risk Groups (Non-Indigenous Youth)

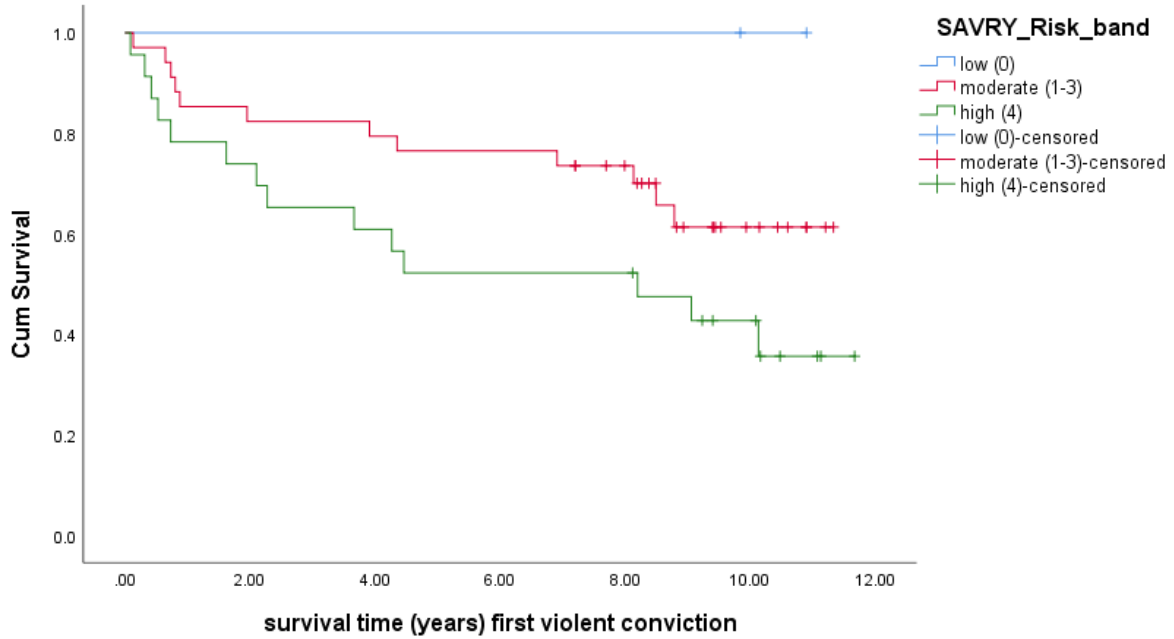

Table 3.47

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 19$)	Medium (15-24, $n = 22$)
Medium (15-24, $n = 22$)	2.80	-
High (25-40, $n = 14$)	6.70**	0.94

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.34

Survival Analysis: Rates of Any New Conviction Over Time for PCL: YV Risk Groups (Male Youth)
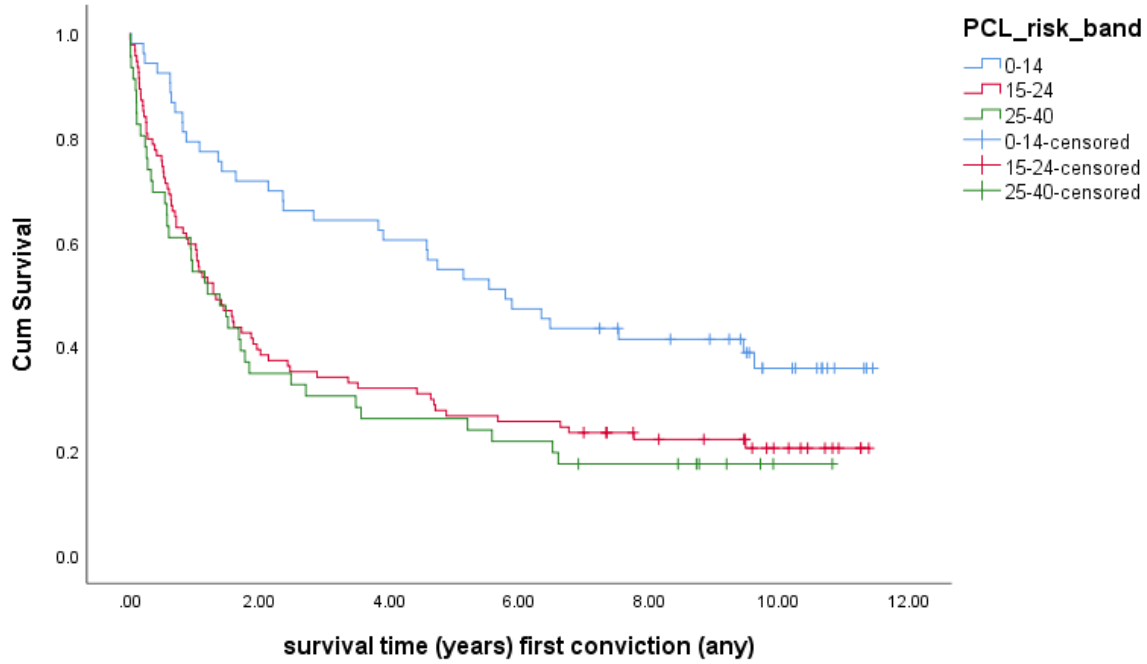
Table 3.48

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 53$)	Medium (15-24, $n = 94$)
Medium (15-24, $n = 94$)	9.11**	-
High (50-69, $n = 46$)	10.89**	0.45

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.35

*Survival Analysis: Rates of Any New Conviction Over Time for PCL: YV Risk Groups (Female Youth)*

Table 3.49

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 12$)	Medium (15-24, $n = 37$)
Medium (15-24, $n = 37$)	0.15	-
High (25-40, $n = 10$)	2.52	5.80*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.36

Survival Analysis: Rates of Any New Violent Conviction Over Time for PCL: YV Risk Groups (Total Sample)

Table 3.50

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Violent Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 65$)	Medium (15-24, $n = 131$)
Medium (15-24, $n = 131$)	9.00**	-
High (25-40, $n = 56$)	10.64**	0.75

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.37

Survival Analysis: Rates of Any New Violent Conviction Over Time for PCL: YV Risk Groups (Indigenous Youth)

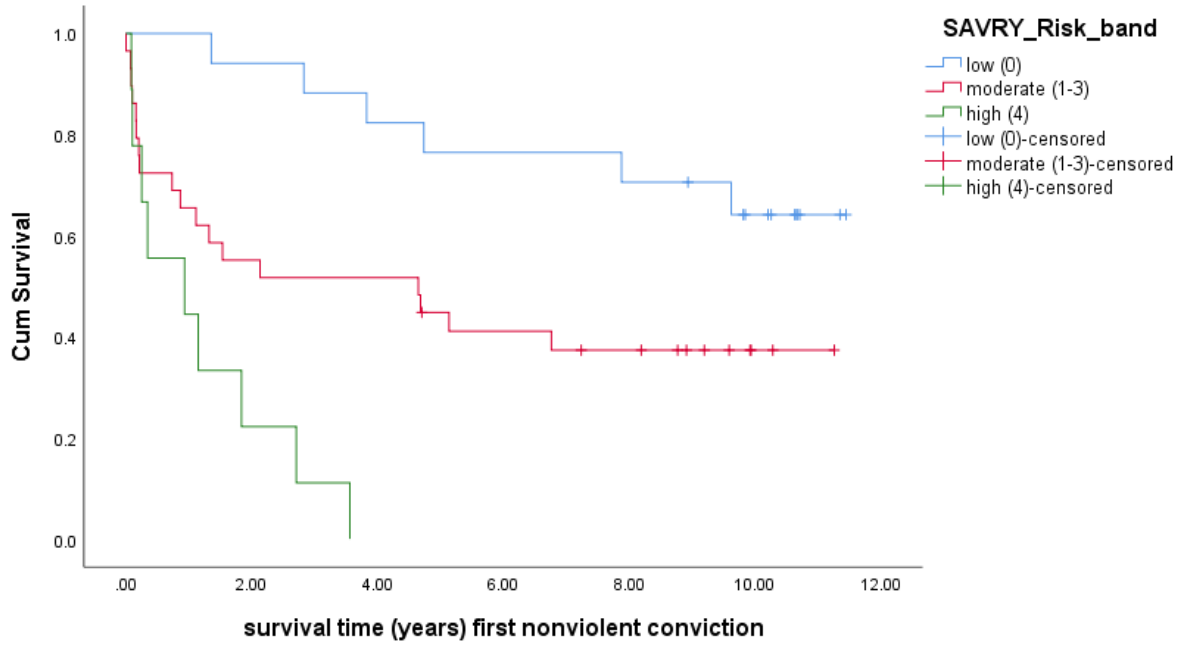Table 3.51

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Violent Conviction (Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 33$)	Medium (15-24, $n = 100$)
Medium (15-24, $n = 100$)	5.87*	-
High (25-40, $n = 38$)	5.34*	0.21

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.38

Survival Analysis: Rates of Any New Violent Conviction Over Time for PCL: YV Risk Groups (Non-Indigenous Youth)
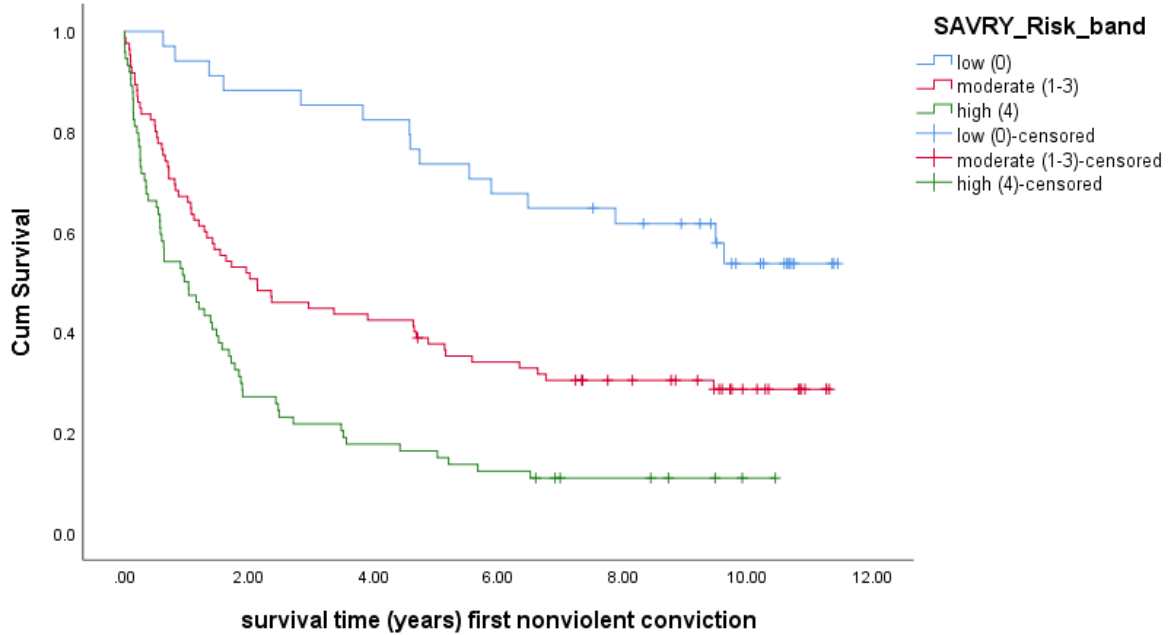

Table 3.52

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Violent Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 19$)	Medium (15-24, $n = 22$)
Medium (15-24, $n = 22$)	1.61	-
High (25-40, $n = 14$)	3.32	0.39

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.39

Survival Analysis: Rates of Any New Violent Conviction Over Time for PCL: YV Risk Groups (Male Youth)

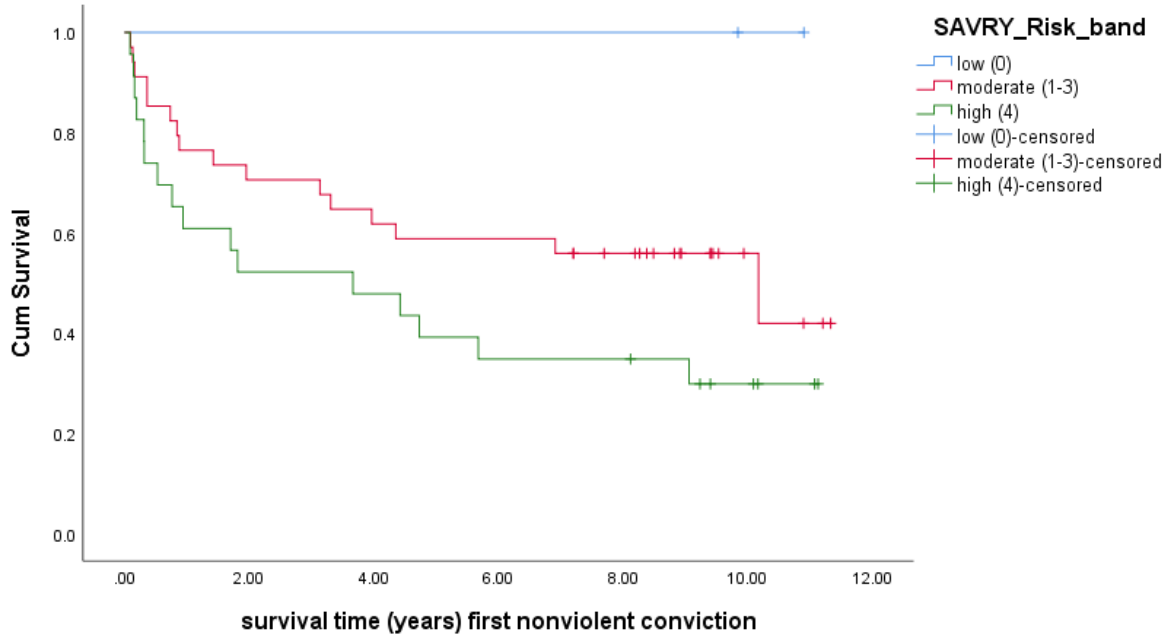Table 3.53

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Violent Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 53$)	Medium (14-25, $n = 94$)
Medium (14-25, $n = 94$)	10.49**	-
High (25-40, $n = 46$)	7.10**	0.03

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.40

*Survival Analysis: Rates of Any New Violent Conviction Over Time for PCL: YV Risk Groups (Female Youth)*

Table 3.54

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Violent Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 12$)	Medium (15-24, $n = 37$)
Medium (15-24, $n = 37$)	1.08	-
High (25-40, $n = 10$)	4.06*	3.41

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.41

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for PCL: YV Risk Groups (Total Sample)
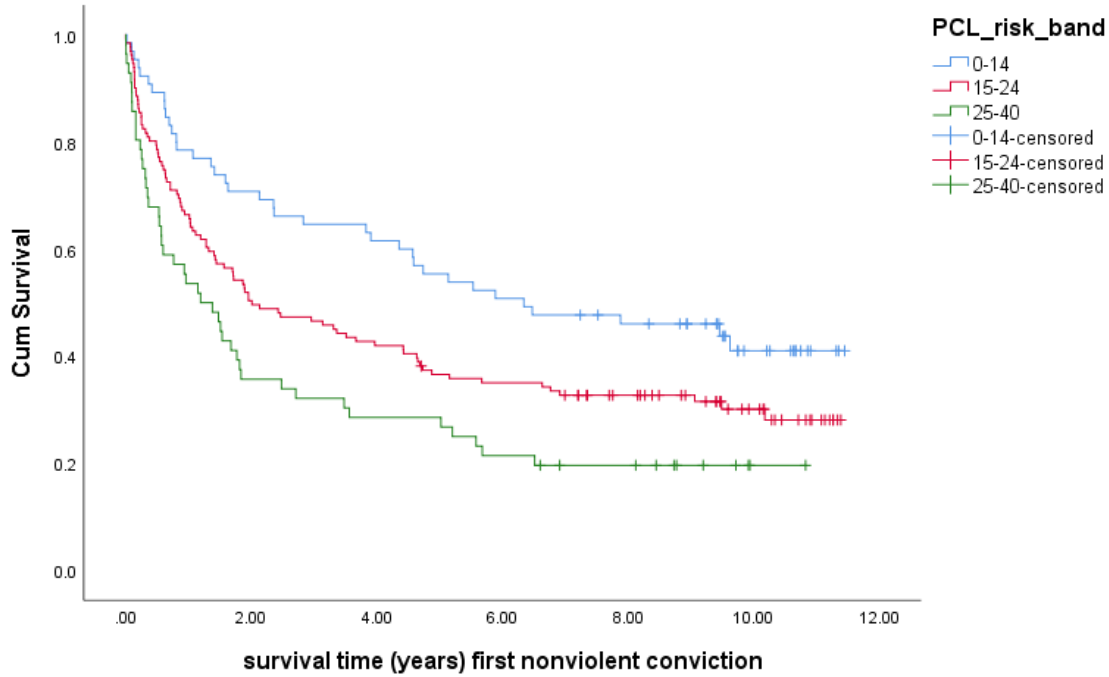
Table 3.55

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Non-violent Conviction (Total Sample)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 65$)	Medium (15-24, $n = 131$)
Medium (15-24, $n = 131$)	4.87*	-
High (25-40, $n = 56$)	13.45***	4.14*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.42

*Survival Analysis: Rates of Any New Non-violent Conviction Over Time for PCL: YV Risk Groups (Indigenous Youth)*
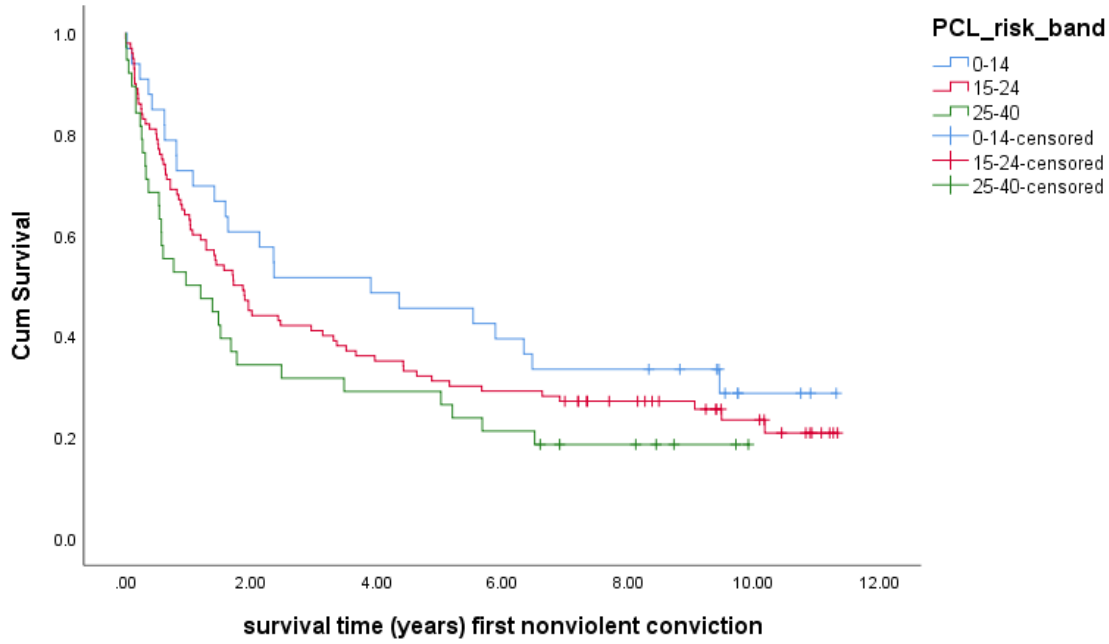
Table 3.56

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Non-violent Conviction (Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 33$)	Medium (15-24, $n = 100$)
Medium (15-24, $n = 100$)	1.13	-
High (25-40, $n = 38$)	3.61	1.73

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.43

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for PCL: YV Risk Groups (Non-Indigenous Youth)
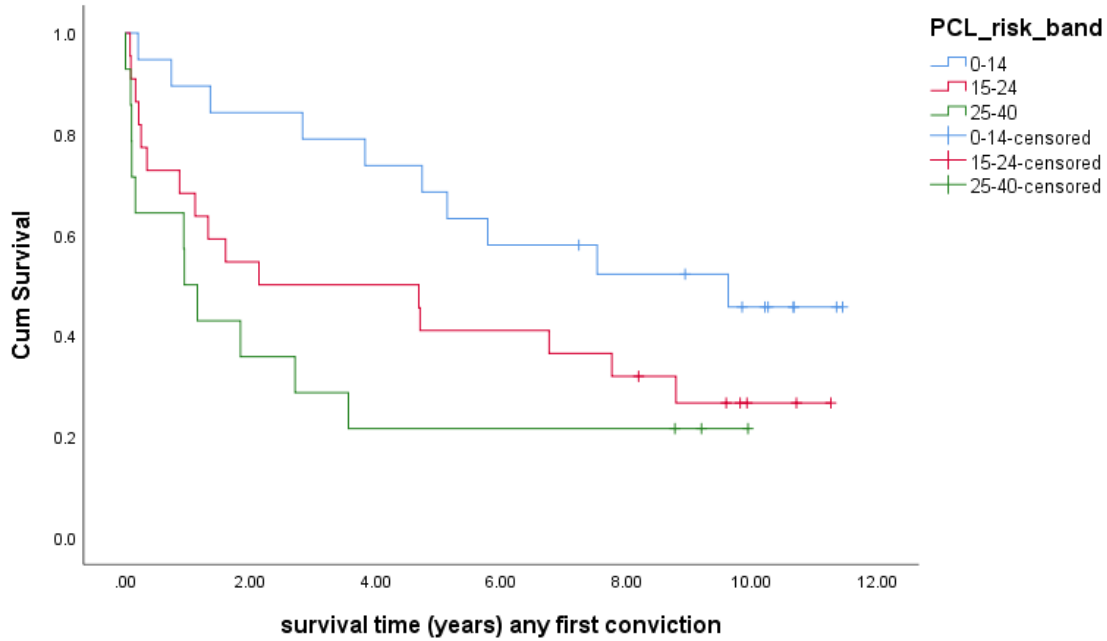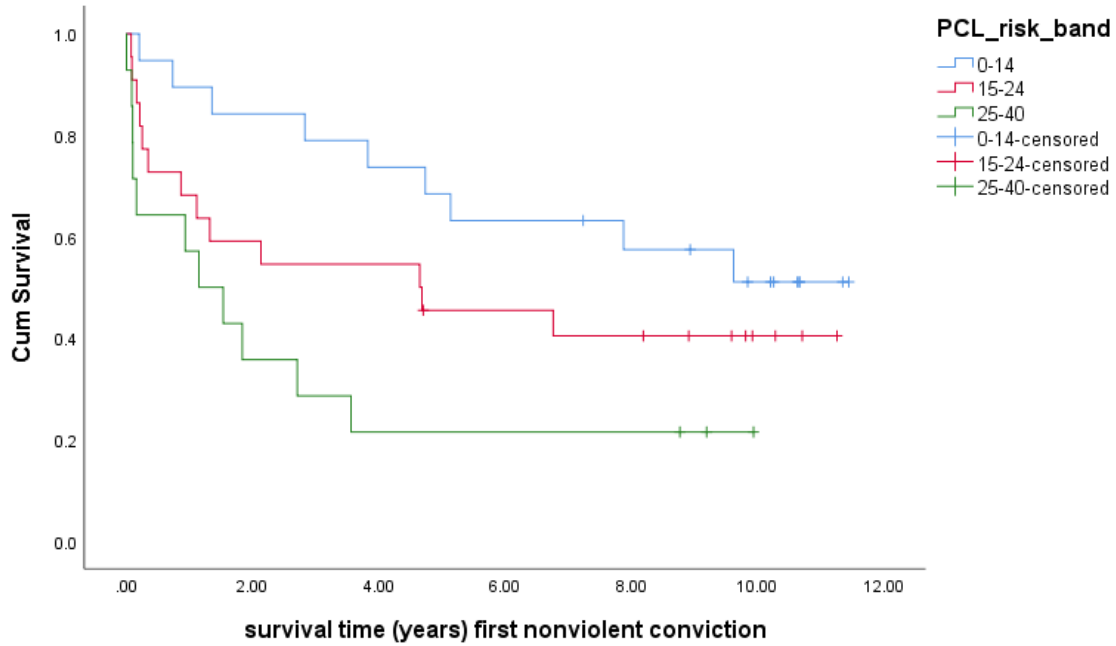

Table 3.57

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Non-violent Conviction (Non-Indigenous Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 19$)	Medium (15-24, $n = 22$)
Medium (15-24, $n = 22$)	1.54	-
High (25-40, $n = 14$)	7.47**	1.95

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.44

*Survival Analysis: Rates of Any New Non-violent Conviction Over Time for PCL: YV Risk Groups (Male Youth)*
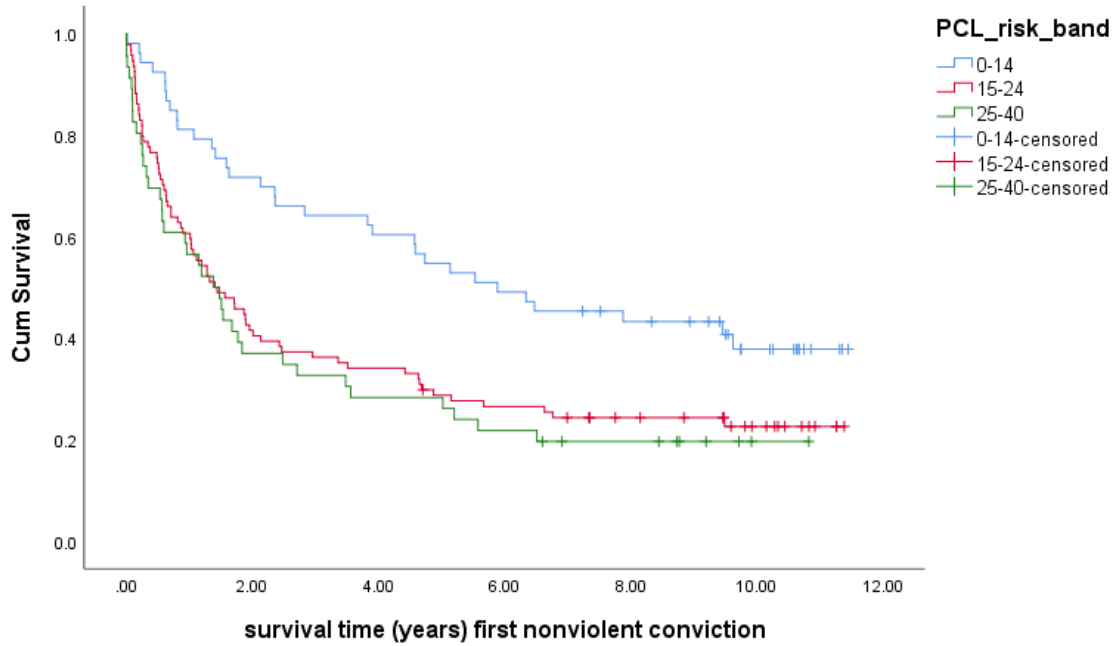
Table 3.58

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Non-violent Conviction (Male Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 53$)	Medium (15-24, $n = 94$)
Medium (15-24, $n = 94$)	8.47**	-
High (25-40, $n = 46$)	10.32**	0.43

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

Figure 3.45

Survival Analysis: Rates of Any New Non-violent Conviction Over Time for PCL: YV Risk Groups (Female Youth)
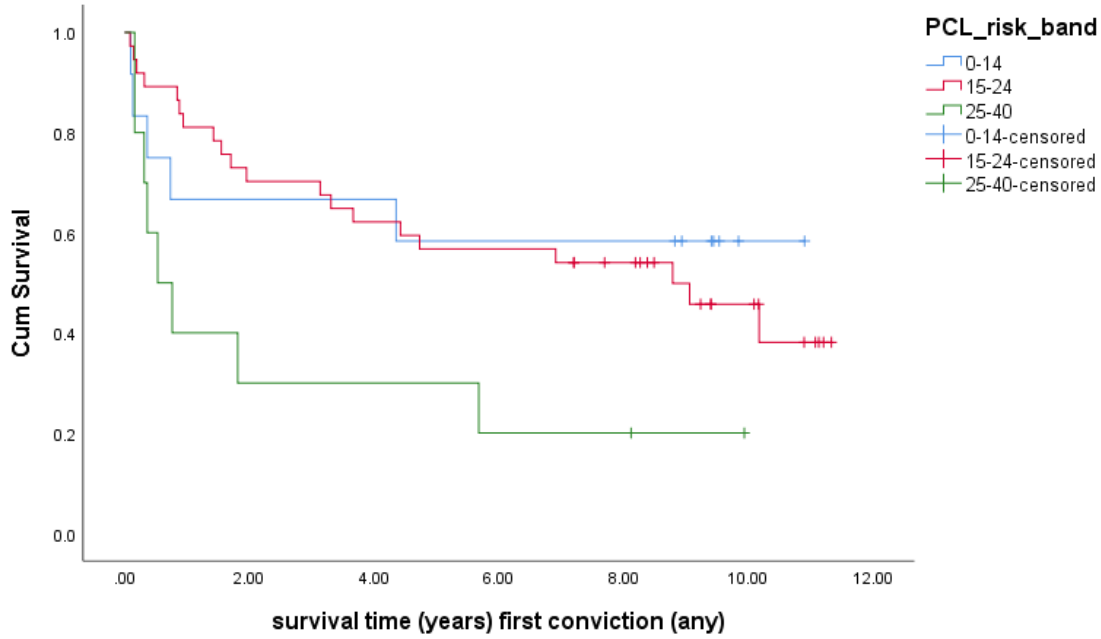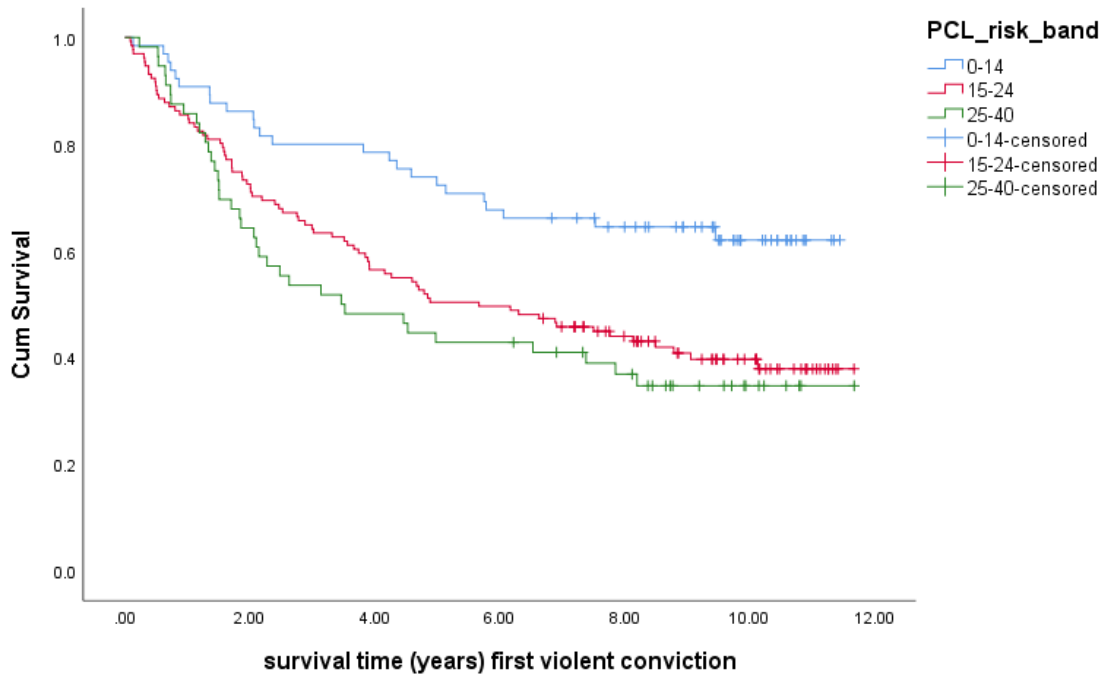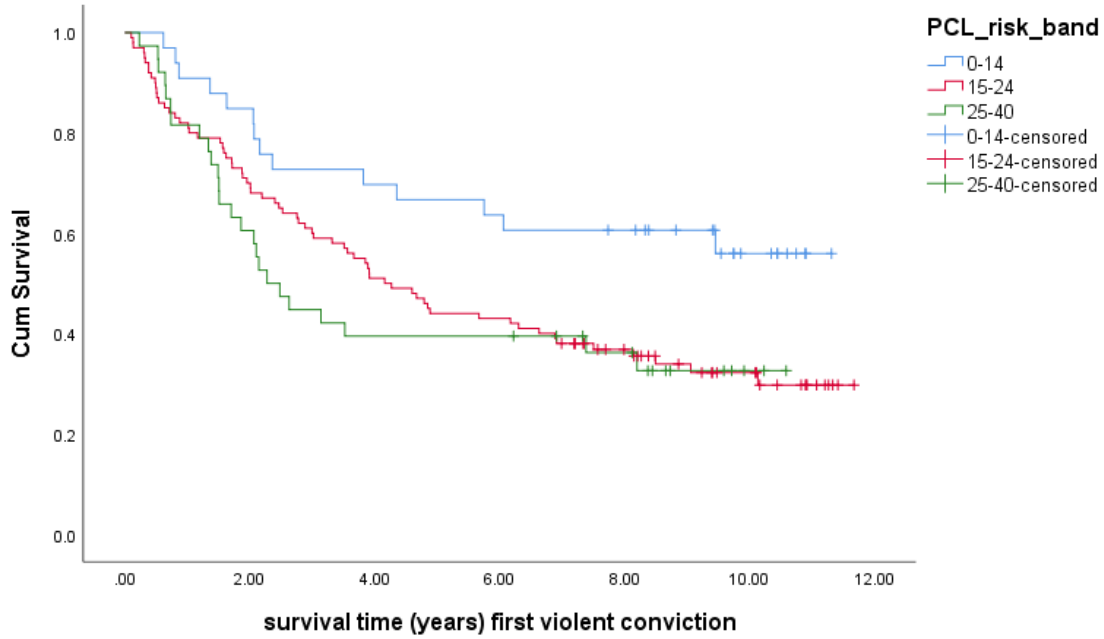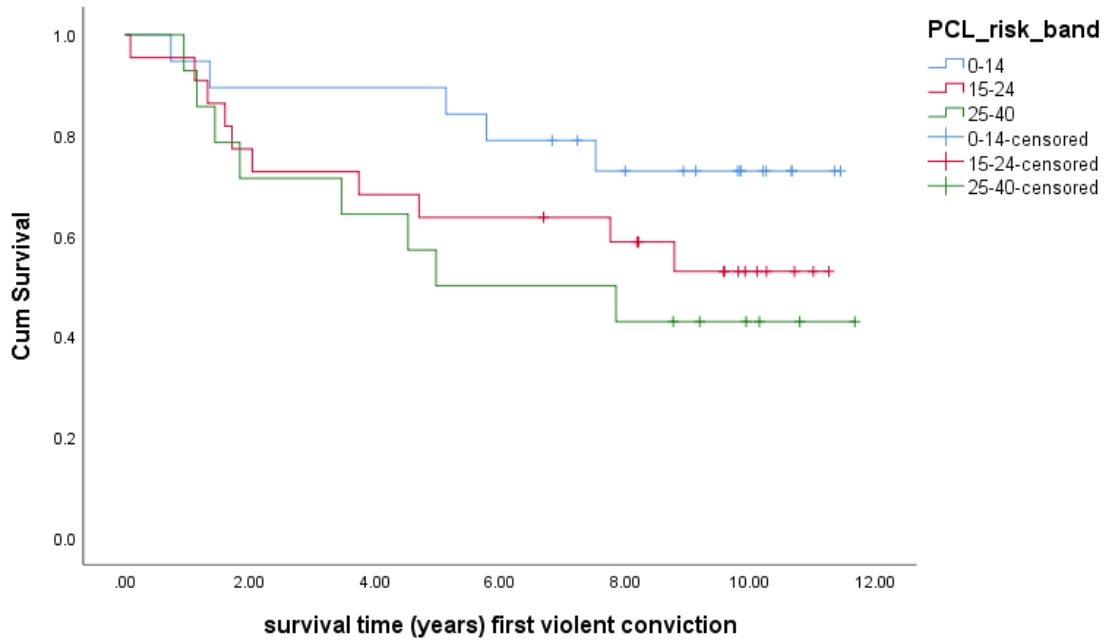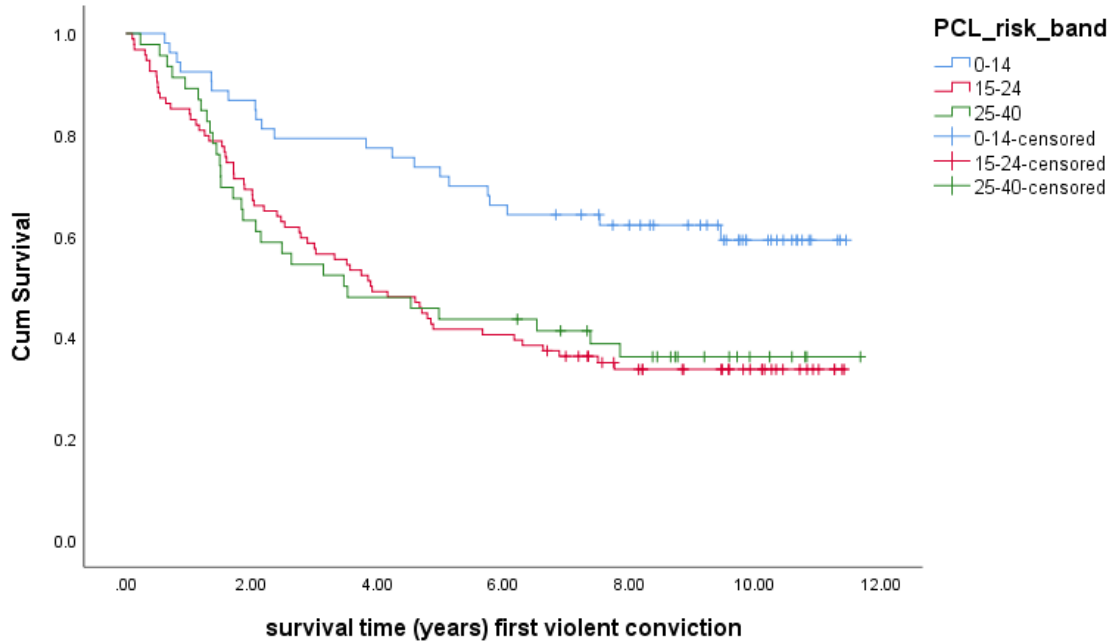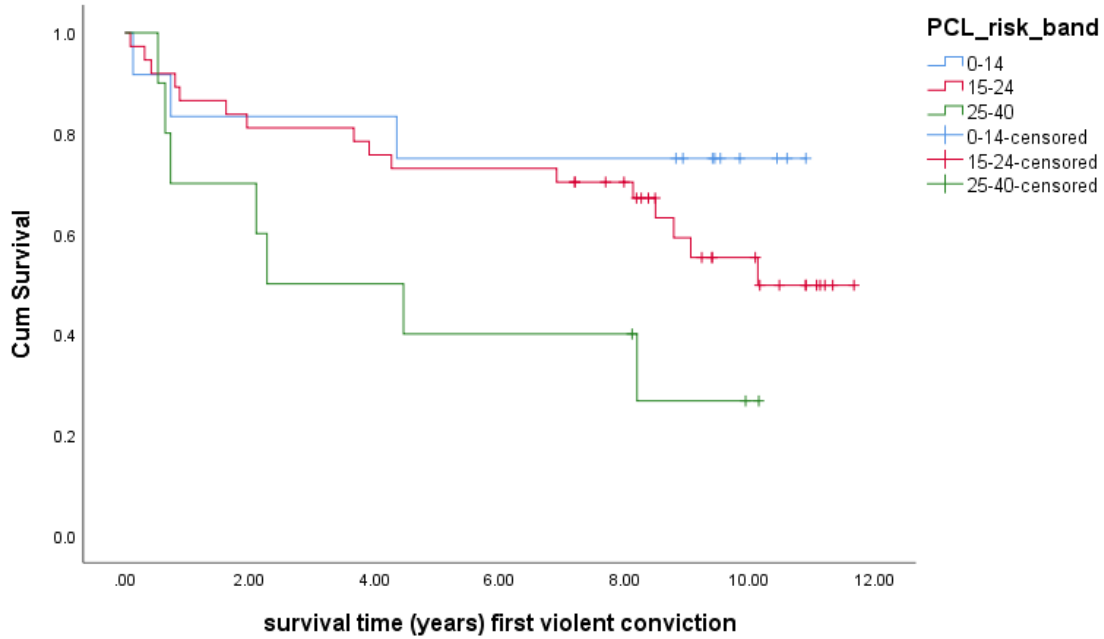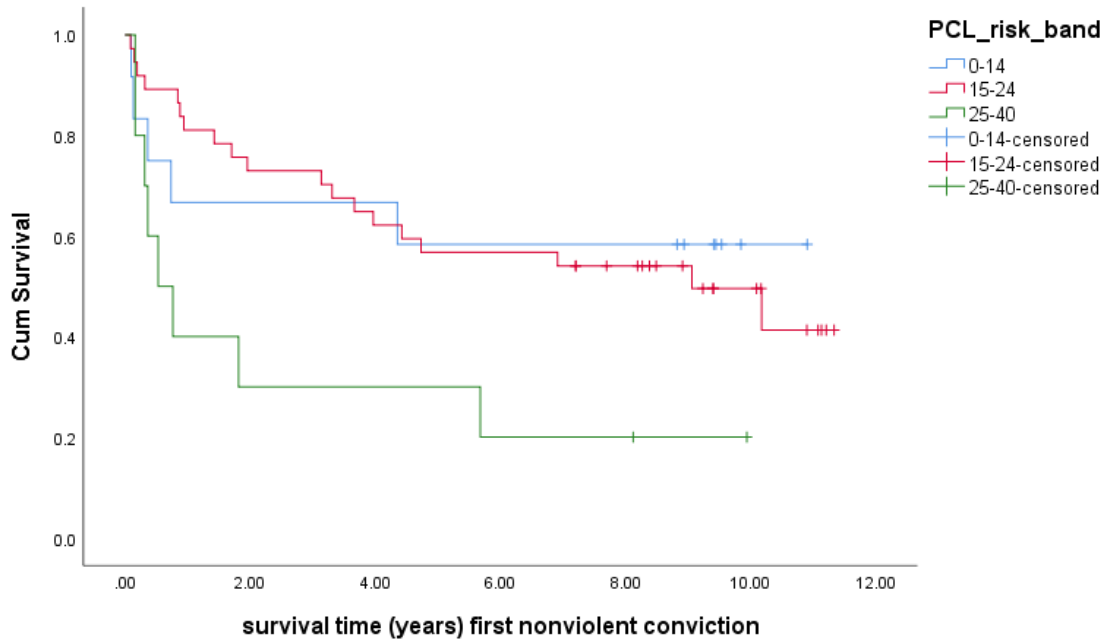

Table 3.59

Log Rank Chi Square Pairwise Comparison PCL: YV Any New Non-violent Conviction (Female Youth)

	Pairwise comparison (log rank χ^2) reference group	
PCL: YV risk band	Low (0-14, $n = 12$)	Medium (15-24, $n = 37$)
Medium (15-24, $n = 37$)	0.05	-
High (24-40, $n = 10$)	2.52	6.26*

Note: *** $p < .001$, ** $p < .01$, * $p < .05$

The second set of calibration analyses examined rates of violent, nonviolent, and any criminal recidivism employing fixed follow-ups. This yields actual observed rates of recidivism associated with a given risk band while mechanically controlling for time at risk in the community. Overall chi square models and Cramer's V measure of association are presented for each measure and disaggregated by gender and ethnic groups. As V represents associations between a categorical variable with a binary outcome, the Rice and Harris (2005) conventions for interpreting correlation magnitude (i.e., for a point biserial correation) were used.

In terms of violent recidivism, the VRS-YV risk bands were significantly associated with fixed 3-year and 5-year rates of this outcome for youth overall (Table 3.60), among male (Table 3.61) and female (Table 3.62) subgroups, and with 3-year rates of violence for Indigenous youth (Table 3.63); observed effects were broadly medium in magnitude. Remaining effects were not significant, although this in part reflects power limitatons from small cell sizes and unstable recidivism rates associated with extreme scores. A similar pattern was observed for non-violent recidivism, except VRS-YV risk bands were now significanly associated with fixed 3-year and 5-year rates for non-Indigenous youth (Table 3.64) but the 5-year fixed follow-up for females and the 3-year fixed follow-up for Indigenous youth were not significant anymore. The same results were observed for any recidivism. Effects were again broadly medium in magnitude for both non-violent and any recidivism.

The SAVRY risk bands were significantly associated with the 3-year and 5-year fixed follow-ups for violent recidivism for the total sample, males, Indigenous youth, and for non-Indigenous 5-year fixed follow-up; effects were medium to large in magnitude. Remaining effects were not significant and tended to be small in magnitude. The same was evidenced for non-violent recidivism, except there was also a significant association with the 3-year fixed follow-up for non-Indigenous youth. The same pattern of findings was observed with respect to any recidivism.

Similarly, the PCL: YV score bands were significantly associated with the 3-year and 5-year fixed follow-ups for violent recidivism for the total sample and males, and with the 5-year fixed follow-up for Indigenous and non-Indigenous youth; effects again tended to be medium in magnitude. The remaining effects were not significant and were small to medium in magnitude. The PCL: YV risk bands were also significantly associated with the 3-year and 5-year fixed follow-ups for non-violent recidivism for the total sample, males, and non-Indigenous youth, and

with the 3-year fixed follow-up for females. The remaining effects were not significant. The association with any recidivism fixed follow-ups looked similar, except the relationships with the 3-year fixed follow-up for females was no longer significant, but were still medium in magnitude.

Finally, the LSI-SK risk scores and the SAPROF-YV SPJ level of protection were also included for these analyses. The LSI-SK risk scores were significantly associated with the 3-year and 5-year fixed follow-up for violent recidivism for the total sample and males, effects broadly medium in magnitude, the remaining effects were not significant but effects were still medium in magnitude. However, for both non-violent and any recidivism the LSI-SK risk scores were significantly associated with the 3-year and 5-year fixed follow-ups for all groups (total sample, males, females, Indigenous youth, and non-Indigenous youth) and were broadly medium to large in magnitude. Alternatively, the SAPROF-YV protection band was significantly associated with the 3-year and 5-year fixed follow-ups for violent recidivism for the total sample, males, and Indigenous youth (medium magnitude), but not for females or non-Indigenous youth (small magnitude). A similar pattern was found for non-violent and any recidivism fixed follow-ups, except there was also a significant relationship with the 3-year and 5-year fixed follow-ups for non-Indigenous youth.

Table 3.60

Associations Between Risk/Forensic Measure Category and Fixed Follow-up Recidivism Outcomes: Total Sample

Measure	3-year			5-year		
	χ^2	p	V	χ^2	p	V
Violent recidivism						
VRS-YV	12.80	.002	0.23	12.62	.002	0.22
SAVRY	18.77	<.001	0.27	24.96	<.001	0.32
PCL: YV	9.72	.008	0.20	11.83	.003	0.22
LSI-SK	16.29	.003	0.24	18.38	.001	0.26
SAPROF-YV	11.91	.018	0.22	16.58	.002	0.26
Nonviolent recidivism						
VRS-YV	13.79	.001	0.23	11.67	.003	0.22
SAVRY	35.98	<.001	0.38	32.23	<.001	0.36
PCL: YV	12.94	.002	0.23	9.76	.008	0.20
LSI-SK	30.13	<.001	0.33	22.16	<.001	0.28
SAPROF-YV	26.79	<.001	0.33	19.65	.001	0.28
Any recidivism						
VRS-YV	14.95	.001	0.24	12.41	.002	0.22
SAVRY	36.75	<.001	0.38	33.48	<.001	0.37
PCL: YV	14.70	.001	0.24	11.37	.003	0.21
LSI-SK	31.62	<.001	0.33	24.72	<.001	0.30
SAPROF-YV	25.67	<.001	0.32	18.91	.001	0.27

Table 3.61

Associations Between Risk/Forensic Measure Category and Fixed Follow-up Recidivism

Outcomes: Males

Measure	3-year			5-year		
	χ^2	*p*	*V*	χ^2	*p*	*V*
Violent recidivism						
VRS-YV	7.91	.019	0.20	11.17	.004	0.24
SAVRY	18.06	<.001	0.31	24.18	<.001	0.36
PCL: YV	8.68	.013	0.21	13.24	.001	0.26
LSI-SK	14.51	.006	0.26	19.11	.001	0.30
SAPROF-YV	14.09	.007	0.27	21.16	<.001	0.33
Nonviolent recidivism						
VRS-YV	19.53	<.001	0.32	13.48	.001	0.27
SAVRY	38.71	<.001	0.45	33.03	<.001	0.42
PCL: YV	13.49	.001	0.26	11.22	.004	0.24
LSI-SK	30.41	<.001	0.37	20.78	<.001	0.31
SAPROF-YV	32.05	<.001	0.41	21.73	<.001	0.34
Any recidivism						
VRS-YV	19.86	<.001	0.32	13.93	.001	0.27
SAVRY	40.64	<.001	0.46	35.20	<.001	0.43
PCL: YV	15.68	<.001	0.29	13.43	.001	0.26
LSI-SK	32.06	<.001	0.38	24.53	<.001	0.34
SAPROF-YV	30.58	<.001	0.40	21.46	<.001	0.33

Table 3.62

Associations Between Risk/Forensic Measure Category and Fixed Follow-up Recidivism
Outcomes: Females

Measure	3-year			5-year		
	χ^2	p	V	χ^2	p	V
	Violent recidivism					
VRS-YV	7.75	.021	0.36	7.78	.021	0.36
SAVRY	2.87	.238	0.22	4.69	.096	0.28
PCL: YV	4.62	.099	0.28	4.28	.118	0.27
LSI-SK	3.37	.339	0.23	2.63	.452	0.20
SAPROF-YV	1.15	.765	0.14	1.71	.635	0.17
	Nonviolent recidivism					
VRS-YV	7.00	.030	0.34	5.96	.051	0.32
SAVRY	3.17	.205	0.23	4.00	.135	0.26
PCL: YV	6.38	.041	0.33	2.46	.292	0.20
LSI-SK	8.15	.043	0.35	8.35	.039	0.36
SAPROF-YV	2.05	.563	0.19	3.43	.342	0.24
	Any recidivism					
VRS-YV	6.02	.049	0.32	5.96	.051	0.32
SAVRY	2.64	.268	0.21	4.00	.135	0.26
PCL: YV	5.56	.062	0.31	2.46	.292	0.20
LSI-SK	9.97	.019	0.39	8.35	.039	0.36
SAPROF-YV	2.33	.507	0.20	3.43	.342	0.24

Table 3.63

Associations Between Risk/Forensic Measure Category and Fixed Follow-up Recidivism Outcomes: Indigenous

Measure	3-year			5-year		
	χ^2	p	V	χ^2	p	V
	Violent recidivism					
VRS-YV	6.95	.031	0.20	4.96	.084	0.17
SAVRY	6.43	.040	0.19	7.71	.021	0.21
PCL: YV	5.81	.055	0.18	6.07	.048	0.19
LSI-SK	6.74	.150	0.18	7.10	.131	0.19
SAPROF-YV	8.99	.029	0.23	10.97	.012	0.25
	Nonviolent recidivism					
VRS-YV	2.20	.334	0.11	1.76	.415	0.10
SAVRY	9.66	.008	0.24	10.89	.004	0.25
PCL: YV	2.90	.234	0.13	2.63	.268	0.12
LSI-SK	13.10	.011	0.25	9.72	.045	0.22
SAPROF-YV	8.58	.035	0.22	8.87	.031	0.23
	Any recidivism					
VRS-YV	3.23	.199	0.14	2.56	.278	0.12
SAVRY	9.64	.008	0.24	11.57	.003	0.26
PCL: YV	3.78	.151	0.15	3.32	.190	0.14
LSI-SK	15.91	.003	0.28	12.02	.017	0.24
SAPROF-YV	10.10	.018	0.24	9.94	.019	0.24

Table 3.64

Associations Between Risk/Forensic Measure Category and Fixed Follow-up Recidivism

Outcomes: Non-Indigenous

Measure	3-year			5-year		
	χ^2	p	V	χ^2	p	V
Violent recidivism						
VRS-YV	4.01	.135	0.27	4.62	.099	0.29
SAVRY	3.80	.150	0.26	10.55	.005	0.44
PCL: YV	2.18	.337	0.20	6.39	.041	0.34
LSI-SK	5.74	.220	0.31	8.84	.065	0.39
SAPROF-YV	2.24	.693	0.20	5.77	.217	0.32
Nonviolent recidivism						
VRS-YV	9.99	.007	0.43	8.50	.014	0.39
SAVRY	14.77	.001	0.52	13.95	.001	0.50
PCL: YV	8.37	.015	0.39	7.19	.027	0.36
LSI-SK	12.05	.017	0.46	11.52	.021	0.45
SAPROF-YV	16.54	.002	0.55	12.13	.016	0.47
Any recidivism						
VRS-YV	8.40	.015	0.39	7.13	.028	0.36
SAVRY	15.09	.001	0.52	14.29	.001	0.51
PCL: YV	8.56	.014	0.39	7.49	.024	0.37
LSI-SK	10.56	.032	0.43	11.75	.019	0.45
SAPROF-YV	13.83	.008	0.50	10.46	.033	0.44

The final set of analyses employed logistic regression (LR) to estimate rates of recidivism associated with specific VRS-YV scores. For space considerations, LR was employed only for the VRS-YV, as an actuarial tool (i.e., numeric risk scores associated with recidivism rates) using fixed 5-year follow-ups. Given that the VRS-YV is intended specifically to assess risk for violence, this outcome was the focus of analysis. In all analyses, the Hosmer Lemeshow chi square goodness of fit test was nonsignificant. The equation taken from Tabachnick and Fidell (2007) was employed to generate recidivism estimates: $\frac{e^{B_0 + B_1 x Score}}{(1 + e^{B_0 + B_1 x Score})}$

As seen in Figure 3.46, and as reported in the LR findings, increasing VRS-YV scores were associated with sucessively higher rates of 5-year violent recidivism overall (dotted line; $B_0 = -2.228$ $B_1 = 0.055$) and among male (red line; $B_0 = -2.088$ $B_1 = 0.056$) and female (blue line; $B_0 = -3.366$ $B_1 = 0.066$) youth. Male youth, however, had higher rates of 5-year violent recidivism associated with any given VRS-YV total score than female youth. Thus, although the rates of increase in recidivism are not different between male and female youth, the same risk score will be associated with different 5-year violent recidivism likelihoods between the genders.

As seen Figure 3.47, increasing VRS-YV scores were also associated with 5-year violent recidivism for Indigenous (blue line; $B_0 = -1.601$ $B_1 = 0.043$) and non-Indigenous (red line; $B_0 = -3.256$ $B_1 = 0.074$) youth, the overall is again represented by the dotted line. There are no differences between the groups at upper moderate and high scores in rates of recidivism, but Indigenous youth with lower moderate or low risk scores have higher estimated rates of recidivism associated with the same risk score.

Figure 3.46

Logistic Regression Generated 5-year Violent Recidivism Estimates for VRS-YV Scores as a Function of Gender. (Note: Total sample B_0 = -2.228 B_1 = 0.055; Female B_0 = -3.366 B_1 = 0.066; Male B_0 = -2.088 B_1 = 0.056)
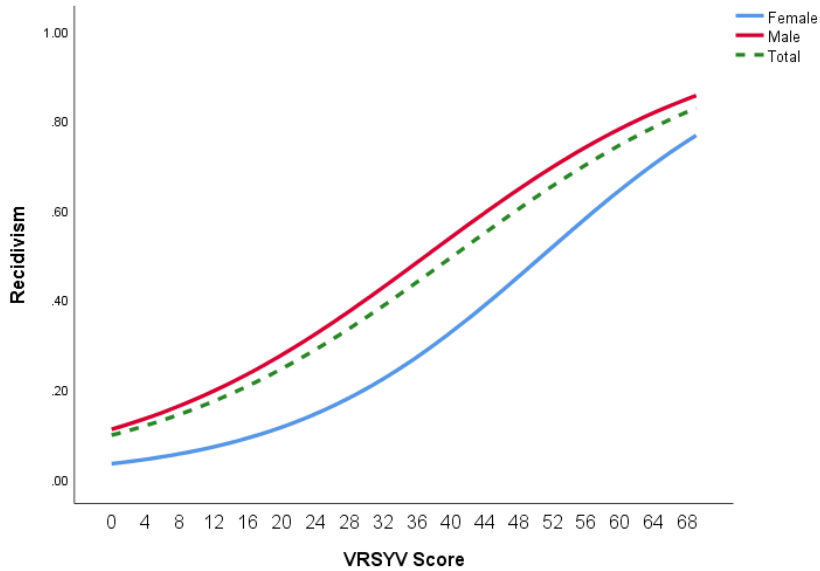
Figure 3.47

Logistic Regression Generated 5-year Violent Recidivism Estimates for VRS-YV Scores as a Function of Indigenous Ancestry. (Note: Total Sample B_0 = -2.228 B_1 = 0.055; Indigenous B_0 = -1.601 B_1 = 0.043; non-Indigenous B_0 = -3.256 B_1 = 0.074)
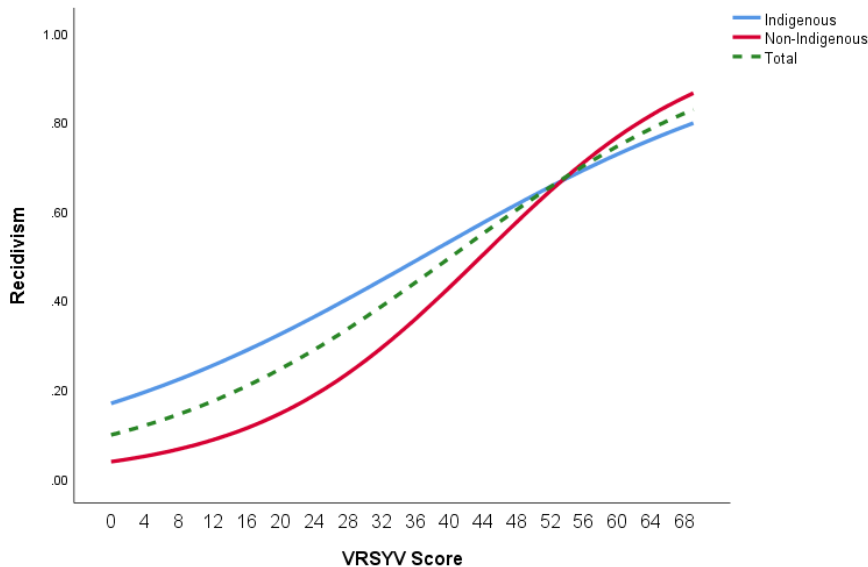
3.8 Group Differences of Forensic Measures Total and Component/ Factor Scores (Hypothesis Five)

3.8.1 *Indigenous and Non-Indigenous Comparisons*

A MANOVA was used the compare the scores on the forensic measures and the component/ factor scores between Indigenous youth and non-Indigenous youth. Table 3.65 presents the differences between the two ethnic subgroups.

Indigenous youth scored significantly higher than non-Indigenous youth on all forensic measure total scores and all component/ factor scores measuring risk, with the exception of the PCL: YV interpersonal and affective scores, which did not significantly differ between the two groups. Total score differences were significant at the $p < .001$ level, except for the PCL: YV total score, which was significant at the $p < .05$ level. All significant component/ factor scores measuring risk were significant at the $p < .001$ level. Indigenous youth scored significantly lower on the measure designed to assess protective factors, and the component/ factor scores designed to assess protective factors, all at the $p < .001$ level, except the SAPROF-YV resilience and relational scores, where $p = .001$.

Cohen's d was also calculated as a measure of effect size and is presented in Table 3.65. The effect sizes ranged from 0.14 to 1.21, with most differences demonstrating a moderate to large effect.

Table 3.65

Forensic Measures Total and Component/ Factor Scores: Indigenous and Non-Indigenous Comparison

Measure	F	*p*	Indigenous M(SD)	Non-Indigenous M(SD)	d
SAVRY Total	60.28	< .001	28.34 (7.06)	19.47 (8.67)	1.12
SAVRY Historical	60.45	< .001	9.93 (3.50)	5.86 (3.20)	1.21
SAVRY Social	52.06	< .001	6.95 (2.19)	4.47 (2.44)	1.07
SAVRY Individual	20.87	< .001	11.55 (3.13)	9.12 (4.41)	0.64
SAVRY Protective	17.16	< .001	1.07 (1.21)	1.89 (1.54)	0.59
PCL:YV Total	5.92	.016	19.51 (6.33)	17.00 (7.91)	0.35
PCL:YV Interpersonal	5.59	.19	1.48 (1.55)	2.11 (2.24)	0.33
PCL:YV Affective	0.92	.34	4.94 (2.18)	4.61 (2.46)	0.14
PCL:YV Lifestyle	14.58	< .001	6.35 (2.07)	5.05 (2.67)	0.54
PCL:YV Antisocial	24.72	< .001	6.06 (2.44)	4.21 (2.42)	0.76
VRS-YV Total (Pre)	27.53	< .001	39.53 (10.43)	30.63 (12.98)	0.76
VRS-YV Stable (Pre)	31.68	< .001	5.89 (2.43)	3.83 (2.32)	0.87
VRS-YV Dynamic (Pre)	23.13	< .001	32.88 (8.84)	25.95 (11.11)	0.69
SAPROF-YV Total	32.60	< .001	6.42 (3.77)	10.26 (5.97)	0.77
SAPROF-YV Resilience	10.50	.001	1.11 (1.14)	1.72 (1.50)	0.46
SAPROF-YV Motivational	32.27	< .001	1.68 (1.92)	3.61 (2.98)	0.77
SAPROF-YV Relational	10.62	.001	1.59 (1.25)	2.26 (1.61)	0.46
SAPROF-YV External	16.48	< .001	2.03 (0.91)	2.61 (1.05)	0.59

3.8.2 *Male and Female*

A MANOVA was used the compare the scores on the forensic measures and the component/ factor scores between males and females. Table 3.66 presents the differences between the two gender subgroups.

The differences between male and female scores varied, with most of the comparisons demonstrating no significant difference including the SAVRY historical and individual/ clinical scores, all PCL: YV scores (total, interpersonal, affective, lifestyle, and antisocial), all VRS-YV pre-treatment scores (total, stable, and dynamic), and SAPROF-YV resilience, motivational, and external scores. However, there was a significant difference between male and female scores on the SAVRY total, with females scoring significantly higher than males ($p < .05$). There was also a significant difference on the SAVRY individual social/contextual score with females again scoring higher than males ($p < .01$). There were also some significant differences on measures and component/ factor scores designed to assess protective factors, with females scoring significantly lower on the SAVRY protective score ($p < .05$), SAPROF-YV total score ($p < .05$), and the SAPROF-YV relational score ($p < .001$).

Cohen's d was also calculated as a measure of effect size and is presented in Table 3.66. The effect sizes ranged from 0.002 to 0.60, with most falling in the low to moderate effect size range.

Table 3.66

Forensic Measures Total and Component/ Factor Scores: Male and Female Comparison

Measure	F	*p*	Male M(SD)	Female M(SD)	d
SAVRY Total	5.23	.023	25.07 (8.89)	27.88 (6.27)	0.37
SAVRY Historical	3.65	.057	8.49 (3.97)	9.57 (3.36)	0.29
SAVRY Social	9.76	.002	5.97 (2.59)	7.10 (1.88)	0.50
SAVRY Individual	1.34	.248	10.65 (3.91)	11.28 (2.77)	0.19
SAVRY Protective	6.06	.014	1.40 (1.40)	0.92 (1.11)	0.38
PCL:YV Total	0.000	.986	18.57 (7.22)	18.55 (6.08)	0.002
PCL:YV Interpersonal	1.73	.190	1.71 (1.83)	1.37 (1.59)	0.20
PCL:YV Affective	.099	.753	4.76 (2.27)	4.87 (2.27)	0.05
PCL:YV Lifestyle	0.242	.623	5.86 (2.45)	6.03 (1.98)	0.08
PCL:YV Antisocial	0.004	.948	5.44 (2.75)	5.42 (2.11)	0.01
VRS-YV Total (Pre)	1.974	.161	36.21 (12.54)	38.68 (9.59)	0.22
VRS-YV Stable (Pre)	3.168	.076	5.13 (2.59)	5.80 (2.39)	0.27
VRS-YV Dynamic (Pre)	1.006	.317	30.32 (10.62)	31.82 (8.05)	0.16
SAPROF-YV Total	5.710	.018	7.82 (5.00)	6.17 (3.46)	0.38
SAPROF-YV Resilience	1.693	.194	1.32 (1.32)	1.08 (0.89)	0.21
SAPROF-YV Motivational	2.748	.099	2.35 (2.52)	1.77 (1.87)	0.26
SAPROF-YV Relational	14.34	< .001	1.94 (1.43)	1.18 (1.10)	0.60
SAPROF-YV External	0.648	.422	2.20 (0.96)	2.08 (1.00)	0.12

3.9 Incremental Predictive Validity (Hypothesis six)

To examine the incremental predictive validity of measures, Cox Regression Analyses were conducted. Specific pairings were selected and then compared for violent, non-violent, and any recidivism (see Tables 3.67, 3.68, and 3.69). First, the VRS-YV stable and dynamic scores were entered, as the VRS-YV stable did not add incrementally to the prediction of risk for violent, non-violent, or general recidivism, the VRS-YV dynamic score was used for all other comparisons instead of the VRS-YV total score.

When the VRS-YV dynamic and SAVRY were entered together, the SAVRY out-performed the VRS-YV dynamic score for violent, non-violent, and general recidivism. The VRS-YV dynamic score did not account for any additional variance.

Alternatively, when the VRS-YV dynamic was entered with the LSI-SK risk category, the VRS-YV contributed more to the prediction of violent recidivism, with the LSI-SK having no significant contribution, but this relationship flipped for non-violent recidivism, with the LSI-SK being dominant and the VRS-YV dynamic adding nothing new. For any recidivism both were equal players.

When the VRS-YV dynamic and SAPROF-YV were entered together, the VRS-YV dynamic was dominant for violent, non-violent, and any recidivism, although the SAPROF-YV did appear to be adding more to non-violent and any recidivism, it was not significant. This pattern repeated when the VRS-YV dynamic and PCL: YV were entered, with the VRS-YV dynamic being the main contributor across the board.

The SAVRY and PCL: YV were entered together as well as the SAVRY and SAPROF-YV, both times the SAVRY contributed to the prediction of violent, non-violent, and any recidivism but the PCL: YV and SAPROF: YV did not add anything new.

Finally, the PCL: YV and LSI-SK were entered together. The PCL: YV was the stronger contributor for the prediction of violent recidivism but the LSI-SK was for non-violent recidivism. However, both the PCL: YV and the LSI-SK were significant contributors to the prediction of any recidivism.

Table 3.67

Cox Regression Survival Analysis: Incremental Predictive Validity of Forensic Measures for Violent Recidivism

Regression model	B	SE	Wald	e^B	*p*	95% CI
			Violent recidivism			
Model 1						
VRS-YV Stable (Pre)	.05	.01	13.50	1.05	<.001	1.02, 1.08
VRS-YV Dynamic (Pre)	-.002	.05	0.001	1.00	.975	.91, .1.10
Model 2						
VRS-YV Dynamic (pre)	.01	.02	0.57	1.01	.449	0.98, 1.05
SAVRY	.05	.02	6.39	1.05	.011	1.01, 1.10
Model 3						
VRS-YV Dynamic (pre)	.05	.01	10.98	1.05	.001	1.02, 1.07
LSI-SK	.04	.12	0.11	1.04	.745	.83, 1.31
Model 4						
VRS-YV Dynamic (Pre)	.04	.01	6.88	1.04	.009	1.01, 1.06
SAPROF-YV	-.05	.03	2.24	.96	.135	.90, 1.01
Model 5						
VRS-YV Dynamic (Pre)	.05	.01	9.54	1.05	.002	1.02, 1.08
PCL: YV	.01	.02	0.17	1.01	.681	.97, 1.05
Model 6						
SAVRY	.06	.02	15.31	1.06	<.001	1.03, 1.09
PCL: YV	.01	.02	0.48	1.01	.490	.98, 1.05
Model 7						
SAVRY	.06	.02	10.36	1.06	.001	1.03, 1.10
SAPROF-YV	-.01	.04	0.13	0.99	.716	.92, 1.06
Model 8						
PCL: YV	.04	.02	5.64	1.04	.018	1.01, 1.07
LSI-SK	.18	.10	3.44	1.20	.063	.99, 1.46

Table 3.68

Cox Regression Survival Analysis: Incremental Predictive Validity of Forensic Measures for Non-violent Recidivism

Regression model	B	SE	Wald	e^B	*p*	95% CI
			Non-violent recidivism			
Model 9						
VRS-YV Stable (Pre)	.04	.01	10.55	1.04	.001	1.02, 1.07
VRS-YV Dynamic (Pre)	.01	.05	0.05	1.01	.824	.93, 1.10
Model 10						
VRS-YV Dynamic (pre)	.01	.02	0.23	1.01	.631	0.98, 1.04
SAVRY	.05	.02	6.55	1.05	.010	1.01, 1.09
Model 11						
VRS-YV Dynamic (pre)	.02	.01	2.74	1.02	.098	1.00, 1.04
LSI-SK	.23	.10	5.00	1.26	.025	1.03, 1.55
Model 12						
VRS-YV Dynamic (Pre)	.03	.01	4.59	1.03	.032	1.00
SAPROF-YV	-.05	.03	3.45	.95	.063	.90, 1.00
Model 13						
VRS-YV Dynamic (Pre)	.03	.01	6.52	1.03	.011	1.01, 1.06
PCL: YV	.02	.02	0.85	1.02	.355	.98, 1.05
Model 14						
SAVRY	.05	.02	7.69	1.05	<.001	1.02, 1.08
PCL: YV	.01	.01	0.65	1.01	.420	.98. 1.05
Model 15						
SAVRY	.05	.02	7.69	1.05	.006	1.01, 1.05
SAPROF-YV	-.02	.03	0.52	.98	.473	.92, 1.04
Model 16						
PCL: YV	.02	.01	2.95	1.02	.086	1.00, 1.05
LSI-SK	.27	.09	9.03	1.31	.003	1.10, 1.56

Table 3.69

Cox Regression Survival Analysis: Incremental Predictive Validity of Forensic Measures for Any Recidivism

Regression model	B	SE	Wald	e^B	p	95% CI
			Any recidivism			
Model 17						
VRS-YV Stable (Pre)	.04	.01	11.44	1.04	.001	1.02, 1.07
VRS-YV Dynamic (Pre)	.00	.04	0.00	1.00	.998	.92, 1.09
Model 18						
VRS-YV Dynamic (pre)	.01	.02	0.65	1.01	.419	.98, 1.04
SAVRY	.04	.02	4.60	1.04	.032	1.00, 1.08
Model 19						
VRS-YV Dynamic (pre)	.02	.01	3.57	1.02	.059	1.00, 1.05
LSI-SK	.18	.10	3.22	1.20	.073	.98, 1.46
Model 20						
VRS-YV Dynamic (Pre)	.03	.01	4.98	1.03	.026	1.00, 1.05
SAPROF-YV	-.04	.03	2.91	.96	.088	.91, 1.01
Model 21						
VRS-YV Dynamic (Pre)	.03	.01	4.60	1.03	.032	1.00, 1.05
PCL: YV	-.04	.03	2.91	.96	.150	.91, 1.01
Model 22						
SAVRY	.05	.01	12.79	1.05	<.001	1.02, 1.08
PCL: YV	.01	.01	0.79	1.01	.374	.98, 1.04
Model 23						
SAVRY	.04	.02	6.50	1.04	.011	1.01, 1.07
SAPROF-YV	-.03	.03	0.67	0.98	.412	.92, 1.04
Model 24						
PCL: YV	.03	.01	5.06	1.03	.024	1.00, 1.06
LSI-SK	.21	.09	6.07	1.24	.014	1.04, 1.46

3.10 VRS-YV Change scores (Hypothesis seven)

Of the 227 youth who received some type of treatment at the Youth Resource Centre, 89 had enough file information available to code pre-treatment and post-treatment information. The average age of the youth who received treatment was 16.61 (SD = 1.58), 74 were males (84%), and 61 were Indigenous (74.4%; 6 youth who received treatment did not have ethnicity information). The last grade completed was approximately grade 8, most were living with at least one parent or another relative (61%), and most were either never or frequently unemployed (72%). All youth who received treatment had information about their index offense, 20.5% had a nonviolent index offense, 59% had a violent index offense, and 20.5% had a sexual index offense.

A paired analysis t-test was used to examine whether significant change occurred after treatment on the VRS-YV total and component scores. There was no significant difference between the pretreatment stable score ($M = 5.45$, $SD = 2.56$) and the post-treatment stable score ($M = 5.48$, $SD = 2.54$), $p = 0.16$. However, there was a significant difference between the pre-treatment dynamic score ($M = 31.48$, $SD = 10.03$) and the post-treatment dynamic score ($M = 29.99$, $SD = 10.11$), $p < .001$. There was also a significant difference between the pre-treatment total score ($M = 37.80$, $SD = 11.87$) and the post-treatment total score ($M = 35.96$, $SD = 11.97$), $p < .001$. The average amount of total change was $M = 1.52$ ($SD = 3.18$), $d = 0.15$, a small effect. Pearson correlations were also conducted to see if there was a relationship between the presence of protective factors and the amount of change on the VRS-YV, however, there was no significant relationships found (Table 3.70).

Cox regression analyses were used to examine whether changes on the VRS-YV were associated with decreases in recidivism (Table 3.71). Previous studies (e.g., Olver et al. 2013) have indicated that change scores are constrained by pre-treatment scores, with high-risk offenders having more room to change, thus typically obtaining higher change scores than lower-risk offenders. In the present sample, VRS-YV change scores were positively correlated with the dynamic pre-treatment score ($r = .15$, $p = .167$). To control for pre-treatment risk level, the VRS-YV total pre-treatment score was entered with the change variable. Controlling for baseline pretreatment risk, VRS-YV change scores were associated in the expected direction with decreased recidivism; the association with decreased rates of non-violent recidivism ($p = .040$) was significant, however, effects for general and violent recidivism were not. Cox regression

analyses were also used to examine if the incremental predictive validity of the VRS-YV changed when post-treatment scores were used (Table 3.72). Contrary to the combination of the VRS-YV pre-treatment score and the SAVRY, when VRS-YV post-treatment scores were entered with the SAVRY, the VRS-YV was the stronger contributor, although not significantly so.

Table 3.70

Correlation: VRS: YV Change and Protective Factors

	VRS: YV Change
SAPROF-YV Resilience	-.15
SAPROF-YV Motivational	.18
SAPROF-YV Relational	.01
SAPROF-YV External	-.10
SAPROF-YV Total	.04
SAVRY Protective	.14

Table 3.71

Cox Regression Survival Analysis: VRS-YV Change Score Associations with Recidivism Outcome Controlling for Baseline Risk

Regression Model	B	SE	Wald	e^B	*p*	95% CI
			Violent Recidivism			
Model 1						
VRS-YV Total (Pre)	.04	.01	6.45	1.04	.011	1.01, 1.07
VRS-YV (Change)	-.07	.05	2.07	0.93	.151	.85, 1.03
			Non-violent Recidivism			
Model 2						
VRS-YV (Pre)	.04	.01	11.48	1.04	.001	1.02, 1.07
VRS-YV (Change)	-.09	.04	4.05	0.92	.044	.84, 1.00
			Any Recidivism			
Model 3						
VRS-YV (Pre)	.04	.01	9.82	1.04	.002	1.02, 1.07
VRS-YV (Change)	-.07	.04	2.69	0.94	.101	.87, 1.01

Table 72

Cox Regression Survival Analysis: Incremental Predictive Validity of VRS-YV Post-Treatment Score

Regression Model	B	SE	Wald	e^B	*p*	95% CI
			Violent Recidivism			
Model 1						
VRS-YV Total (Post)	.03	.04	0.78	1.03	.378	.96, 1.11
SAVRY	.01	.05	0.06	1.01	.810	.92, 1.11
			Non-violent Recidivism			
Model 2						
VRS-YV Total (Post)	.04	.03	1.77	1.04	.184	.98, 1.11
SAVRY	.003	.04	.004	1.00	.947	.92, 1.09
			Any Recidivism			
Model 3						
VRS-YV (Post)	.04	.03	1.93	1.04	.164	.98, 1.11
SAVRY	-.004	.04	.009	.996	.924	.92, 1.08

3.11 Service Engagement and Recidivism (Hypothesis Eight)

3.11.1 *Treatment and Recidivism*

To examine if there was a relationship between individuals who were engaged in treatment and recidivism, correlations were completed between measures of treatment engagement (treatment completed – yes/no, number of individual sessions attended, and number of group sessions attended) and violent, nonviolent, and any recidivism (Table 3.73). Both binary yes/no for type of recidivism and the total number of new convictions for type of recidivism were correlated. Completed treatment was associated with lower rates of non-violent and any recidivism at the $p < .05$ level, but there was no significant relationship with violent recidivism or the number of new convictions. There was no significant relationship between the number of individual sessions attended and any recidivism variable, but there was a significant relationship between the number of group sessions attended and yes/no non-violent recidivism and yes/no any recidivism.

3.11.2 *Protective Factors and Treatment Engagement*

Correlations were used to examine the relationship between protective factors and treatment engagement (Table 3.74). There was no significant relationship between variables used to assess treatment engagement and the SAPROF-YV total or component scores. However, there was a significant relationship between the number of group sessions attended and the SAVRY protective score, but not between the SAVRY protective score and other measures of treatment engagement.

3.11.3 *PCL: YV and Treatment Engagement*

The relationship between the PCL: YV and treatment engagement was also examined (Table 3.74), with many of the correlations not reaching significance. However, there was a significant positive relationship between the PCL: YV lifestyle factor score and number of individual sessions attended, indicating that individuals who score higher on the PCL: YV lifestyle factor also attend more individual sessions, although this was a small correlation. There was also a significant negative relationship between the PCL: YV antisocial factor score and number of group sessions attended, indicating that those with higher PCL: YV antisocial scores attend fewer group sessions and those with lower PCL: YV antisocial scores attend more group sessions.

Table 3.73

Correlation: Treatment Engagement and Recidivism

	Treatment Completed	Individual Sessions Attended	Group Sessions Attended
Yes/no new violent conviction	-.30	.02	-.30
Yes/no new non-violent conviction	-.45*	.01	-.58***
Yes/no new any conviction	-.45*	.07	-.58***
Total new violent convictions	-.25	.05	-.18
Total new non-violent convictions	-.24	-.04	-.08
Total new any conviction	-.28	-.03	-.18

Note: *p <.05, ***p <.001

Table 3.74

Correlation: Treatment Engagement, Protective Factors, and PCL: YV

	Treatment Completed	Individual Sessions Attended	Group Sessions Attended
SAPROF-YV			
Resilience	.30	-.15	-.00
Motivational	.12	.02	.33
Relational	.15	.02	.25
External	.20	.07	-.03
Total	.22	-.002	.23
SAVRY			
Protective	.18	.07	.40*
PCL: YV			
Interpersonal	-.18	.07	.30
Affective	-.03	.16	.18
Lifestyle	-.26	.19*	-.12
Antisocial	-.32	.10	-.40*
Total	-.28	.18	.03

*p < .05

4. DISCUSSION

4.1 General Discussion

Despite the decline in youth crime rates since 2006, over 37% of youth in Canada still report engaging in one or more delinquent behaviors in their lifetime (Statistics Canada, 2016). While many youth will only engage in criminal behavior as adolescents, some will go on to become adult offenders. The current study aimed to contribute to the growing body of literature about the use of risk assessment measures with young offenders as a way to inform intervention, assist with case management, and prevent recidivism. The aim of the present study was to contribute to the body of literature that exists for established assessment tools, a youth variant of the LSI (LSI-SK), the PCL: YV, and the SAVRY, as well as to help bolster the research base for two more recently developed tools, the VRS-YV and the SAPROF-YV. The VRS-YV bridges the gap between assessment and treatment by including a built-in model for change, a unique mechanism that is not included in other established tools. The SAPROF-YV was specifically designed to assess protective factors in youth. The development of these new tools contributes to gaps in the existing literature by capturing the role of treatment change and protective factors in assessing risk and preventing recidivism.

Moreover, the assessment of diverse populations (i.e., Indigenous Peoples and females) using currently available tools (such as those examined in this study) is often a topic of debate. Thus, another important aim of this study was to examine whether the tools currently available to assess risk are valid to use with Indigenous youth and female youth. Finally, the impact of intervention was explored using indirect measures of service engagement and the VRS-YV change scores. Together, the accurate assessment of risk and needs, and identification of protective factors, can guide appropriate and responsive intervention, assess changes in risk as a result of intervention (or other change agents) ultimately decreasing recidivism, and prevent young offender entry into the adult system.

The sample for the current study consisted of 451 files of Saskatchewan youth offenders who had come in contact with the Youth Resource Centre (YRC). The YRC is the adolescent mental health facility in Saskatoon, SK, where young offenders can be referred for court-ordered assessment or treatment. Of the 451 files examined, 257 had enough information available to rate the forensic tools used for the study. The PCL: YV, SAVRY, VRS-YV, and SAPROF-YV were rated by the student researcher and a student research assistant from information available in file.

The LSI-SK is completed by youth community workers for all young offenders in Saskatchewan, and thus the LSI-SK categorical risk and need ratings were extracted directly from file, when available. The mean age of the total sample upon first contact with YRC was 16.6 years. As with most forensic research, the sample was predominately male (74%), with the number of females proportionate to the percentage of females in correctional settings in Canada (approximately one fourth; Statistics Canada, 2017). Consistent with the overrepresentation of Indigenous individuals in the Canadian criminal justice system (Indigenous youth represented 46% of admissions to correctional services in 2016/2017, while Indigenous youth are only 8% of the population; Public Safety Canada, 2018), the present sample consisted largely of individuals of Indigenous ancestry (78%). It should be noted that this variable was treated as binary (yes/ no Indigenous ancestry) by using file information (e.g., the Gladue ruling in a pre-sentence report), and thus may not accurately reflect an individual's level of cultural integration nor does it recognize different Indigenous ancestries. Additionally, due to lack of specific information about ethnicity, this variable was left blank for a large portion of the sample as ethnicity could not be accurately determined.

Recidivism information was collected from official police records (CPIC) in 2019, with the average follow-up time being over nine years. This is a long follow-up period, which allowed for the examination of both youth and adult recidivism. Some past research has had similar follow-up times (e.g., seven years, Stockdale et al., 2010; Stockdale et al., 2014) but most research with young offenders has a much shorter follow-up time (e.g., to two years, Luong & Wormith, 2011; Muir et al., 2020). During the follow-up time a large portion of the sample reoffended at least once, with over 68% acquiring at least one new offense. Youth referred to YRC for assessment and/or treatment often require specialized services and are typically a higher risk category of individuals, which can lead to a high base rate of recidivism. However, base rates in the current sample are comparable with previous research with a similar follow-up period (Stockdale et al., 2010; Stockdale et al., 2014) and higher than research with shorter follow-ups (e.g., Muir et al., 2020). About 40% of the sample committed a new youth offense and 68% committed a new adult offense. Over half the sample had at least one new violent offense and 67% had at least one new non-violent offense. When broken down by ancestry and gender, base rates tended to vary. Consistent with Stockdale et al. (2014), Indigenous youth typically had higher base rates of violent, nonviolent, and any recidivism compared to non-Indigenous youth.

Alternatively, males and females had more comparable base rates as youth, but males recidivated at a higher rate as adults than females did. Of note, some types of recidivism had very low base rates for certain groups. For example, few non-Indigenous youth reoffended violently as youth. Small cells and low base rates may have contributed to some results being non-significant due to decreasing statistical power.

<div align="center">4.2 Validity of Risk Assessment Tools</div>

4.2.1 *Convergent Validity*

The assessment measures and their factor/component scores assessed in the present study were almost all significantly correlated with one another (with the exception of some parts of the PCL: YV). Tools designed to assess risk factors demonstrated moderate to strong positive correlations with other tools designed to assess risk factors. Similarly, scales designed to assess protective factors had moderate to strong positive correlations with other scales designed to assess protective factors. Finally, scores assessing risk had moderate negative correlations with scores assessing protective factors, suggesting that those who have more protective factors present will have lower risk scores. Total score correlations tended to be in the strong range, whereas factor/component score correlations tended to be in the moderate range. The direction and strength of the correlations in the present study are consistent with past research. Shepherd, Luebbers, and Ogloff (2014) correlated the SAVRY with the YLS/CMI and found strong positive correlations for each of the SAVRY risk scales and the total score with the YLS/ CMI factor and total scores. As with the current study, they also noted a negative correlation between the SAVRY protective score and the risk scores. Stockdale et al. (2014) also found strong correlations between the YLS/ CMI, PCL: YV, and the VRS-YV. The current study contributes to the consensus in the literature that well established risk assessment tools are strongly correlated, and that the newer VRS-YV fits with the previously established tools. Additionally, the current research also speaks to the correlation between measures designed to assess protective factors, as many studies examine only one means to measure protective factors, research supporting the correlation between two measures of protective factors is uncommon. Based on the correlation between the SAVRY protective scale and the SAPROF-YV, there appears to be a strong relationship between different measures of protective factors. This relationship has been found in adult research using the SAPROF and the PF list (a list of seven protective factors demonstrated to be associated with reduced recidivism), where a strong

<div align="center">148</div>

positive correlation was found between the two measures (Coupland & Olver, 2020). Moderate to strong correlations indicate that the tools and factor/component scores assessing risk are measuring a related underlying construct, and that the tool and factor score assessing protective factors are also measuring a related underlying construct. Although risk and protective scores are moderately correlated, it is unclear if they are capturing opposite ends of the same underlying construct, or if they are two separate underlying constructs that are negatively correlated. Given both the SAPROF-YV and the SAVRY measure separate factors from identified risk factors (i.e., protection is not measured as an absence of risk), it seems plausible that there may be two different underlying constructs that are both related to risk and recidivism. As suggested by Wong and Gordon (2006), strong correlations do not imply redundancy, and using more than one risk assessment tool (despite the relationship they have with one another) can add valuable information for intervention and case management purposes.

4.2.2 *Predictive Validity*

In general, most AUC values for the measures, component, and factors scores fell in the small to moderate range. More specifically, the VRS-YV dynamic and total pre-treatment scores were significant predictors of youth violent recidivism with AUC values in the small to moderate range, while the stable score was not significant. For adult and any violent recidivism, all scores were significant predictors of recidivism, with AUC values ranging from 0.62 – 0.68. Although the VRS-YV AUC values in the current study (AUC = 0.59 – 0.68) are slightly lower than those found by Stockdale et al. (2014; AUCs = 0.65 – 0.78), all but one value in the current study were significant. Stockdale et al. (2014) were able to access both CPIC records as well as a provincial database of youth recidivism information, which likely provided a more comprehensive measure of recidivism and may have resulted in the stronger AUC values found in that study. Despite smaller AUC values, the results of the current study support the continued use of the VRS-YV with young offenders. Moreover, despite not being specifically designed to assess risk of non-violent recidivism, the VRS-YV was also a moderate to strong predictor of non-violent youth, adult, and any recidivism, with AUC values ranging from 0.62 – 0.67, again consistent with Stockdale et al.'s (2014) past research. Given the unique nature of the VRS-YV to assess change, post-treatment scores are discussed in a separate section below.

Comparing the performance of the VRS-YV in predicting violent recidivism across ethnicity, more AUC values were significant for the Indigenous groups but the magnitude of the

values were similar across both groups, indicating that the small sample size of non-Indigenous youth likely impacted the non-significant finding. For both groups, the AUC values were in the small-moderate range for the pre-treatment dynamic and total scores when predicting adult and any recidivism. The stable score was also predictive of adult and any violent recidivism in the Indigenous group. However, when looking at non-violent recidivism the tool predicted recidivism better for the non-Indigenous group. For non-Indigenous individuals, pre-treatment dynamic and total scores were predictive across the board (AUC values 0.72-0.74) but for Indigenous youth no scores were predictive of non-violent recidivism. These findings are somewhat consistent with Stockdale et al. (2014), who found that AUC values were in the moderate to high range for all types of recidivism in the Indigenous group but AUC values were only significant for violent recidivism for the non-Indigenous group. However, similar to the current study, the Stockdale et al. (2014) study had a small non-Indigenous sample which likely impacted the significance of the findings. The AUC values for the non-Indigenous group in that study were high and comparable to the Indigenous group. Given, the VRS-YV was specifically designed to assess the risk of violence and track treatment change, despite variable performance across ethnicity for non-violent recidivism, it does appear to be a good predictor of youth and adult violent recidivism for both Indigenous and non-Indigenous Individuals.

Comparing the predictive accuracy of the VRS-YV for violent recidivism in males and females, the results were quite similar although the measure does seem to predict youth violent recidivism better for males than females. However, all scores were predictive of adult and any violent recidivism for both males and females. The same pattern was observed for non-violent recidivism. The low AUC values and lack of significance for female youth recidivism may in part be explained by low base rates of recidivism, as only 19 females recidivated violently as a youth and 27 non-violently. Results are still consistent with past research. Stockdale et al. (2014) found that the VRS-YV performed similarly when comparing males and females. Although in the present study females had slightly higher AUC values than males, the opposite was true for Stockdale et al.'s study.

Comparatively, the other tools included in this study, which have larger literature bases supporting their use, continued to have strong predictive accuracy for recidivism. Of note, the SAVRY results are based on the summed score of the individual scales, however, the SAVRY is intended to be used as an SPJ tool and thus the summed score does not factor in the protective

factors scale. Despite this, most of the SAVRY scores related to risk were moderate predictors of youth and adult violent recidivism, with AUC values ranging from 0.61 – 0.69. It also fared well when examining youth and adult nonviolent recidivism, with AUC values from 0.64 – 0.71. It was also a fairly good predictor of adult and any violent recidivism for Indigenous youth, but had variable prediction for non-Indigenous youth where only the total score and Individual/Clinical score attained significance. However, for non-violent recidivism most SAVRY scores were significant for all types of recidivism, but with much strong AUC values for the non-Indigenous group. Additionally, the SAVRY demonstrated moderate to strong predictive validity for males for all types of recidivism, and reached significance for most scales for adult and any violent and non-violent recidivism for females. Many AUC values that did not reach significance were still in the moderate range. The results of the present study are consistent with recent research by Muir et al. (2020). Muir and colleges had a large sample size that allowed for comparison between Caucasian females and Indigenous females and Caucasian males and Indigenous males. In their study, overall, the SAVRY predicted violent and general recidivism almost across the board with moderate to strong predictive accuracy for all cells. Similarly, Meyers and Schmidt (2008) also found that the SAVRY was a moderate predictor of violent recidivism after one year (AUC = 0.64 – 0.68) and a strong predictor of violent recidivism after three years (AUC = 0.70 – 0.80). However, it should be noted that both Muir et al. and Meyers and Schmidt had short follow-up periods that did not allow for examination of the predictive accuracy of the SAVRY for adult recidivism. The present study found slightly smaller AUC values compared to Muir et al. and Meyers and Schmidt, but also allowed for examination of the predictive accuracy of the SAVRY for adult recidivism. In general, the results of the current study are consistent with past research and suggest that the SAVRY continues to be a valid and reliable measure of youth recidivism, and also has acceptable predictive accuracy for adult recidivism.

The PCL: YV also performed similarly to past research (Stockdale, Olver, &Wong, 2010) the lifestyle, antisocial and total scores were significant predictors of youth and adult violent (AUC = 0.61 – 0.70) and nonviolent (AUC = 0.64 – 0.71) recidivism. The affective facet was also a significant predictor of youth nonviolent recidivism; however, it was a small effect (AUC = 0.59) and it was not significant anywhere else. In general, the results were extremely similar for Indigenous and non-Indigenous youth for violent and non-violent recidivism (all types) as well as for males and females, although the AUC values were smaller and non-

significant when predicting female youth recidivism. While the overall pattern of results is similar to that of Stockdale et al. (2010), a major difference is that in the current study the AUC values seem to be stronger and reach significance more for adult recidivism than youth recidivism, which is the opposite to what Stockdale et al. (2010) found, which may be a reflection of the comprehensive measure of youth recidivism Stockdale et al. (2010) used (similar to Stockdale et al., 2014). Vincent et al. (2008) proposed that the affective and interpersonal facets of the PCL: YV are less stable across adolescence compared to the lifestyle and antisocial facets, which might provide a partial explanation for some of the results in the current study. It could be that some factors measured by the PCL: YV (i.e., lifestyle and antisocial factors) become more salient in adulthood and thus could have a stronger, more direct link to risk, while the factors that are less stable (i.e., interpersonal and affective factors) have less of an association with risk. However, it is also noted that the current study was based on file information, and interpersonal and affective items may not be accurately captured. Despite some differences from Stockdale et al. (2010), the current study supports the use of the PCL: YV with diverse populations including females and Indigenous youth, overall supporting its continued use in youth risk assessments.

Finally, the LSI-SK had slightly lower AUC values than expected (AUC = 0.58 – 0.64). It was not a significant predictor of youth violent recidivism, but was for adult violent recidivism and both youth and adult non-violent recidivism (albeit small effects). The AUC values were lower than some previous research has demonstrated for the youth LS family of tools. For example, Olver, Stockdale, and Wong (2012) found AUC values from 0.66-0.77 for nonviolent, violent, and general recidivism for youth, adults, and the total sample. The only past study of the LSI-SK (Luong & Wormith, 2011), found a slightly higher AUC value for the total sample (0.73), however, this study only looked at youth total recidivism. It is also noted that the full LSI-SK score was not available for the current study and thus only the risk level could be used, which may have impacted the findings.

In regard to the subgroups, LSI-SK results reflected the total sample low AUC values, except for the non-Indigenous group where moderate to strong AUC values were found for youth, adult, and any non-violent recidivism and for the female group, which had moderate AUC values for adult and any non-violent recidivism. Again, Luong and Wormith (2011) had higher AUC values for various subgroups, but was also lower for Indigenous youth (0.64) than non-

Indigenous youth (0.79) and was similar for males (0.73) and females (0.74). In general, the LSI-SK is a well-established tool to use to assess risk for general recidivism. Results of the present study are consistent with the tool being used to assess general risk, as it did seem to be a better predictor for non-violent and any recidivism than it was for violent recidivism.

4.2.3 *Incremental Validity*

The current study also looked at the incremental validity of specific pairings of tools. In general, most pairings resulted in one tool being the dominant predictor. For the most part, the SAVRY and the VRS-YV dynamic score were the stronger predictors, and when paired together the SAVRY incrementally predicted outcome when controlling for the VRS-YV dynamic pre-treatment score. However, this outcome was reversed when using the VRS-YV post-treatment score, indicating that post-treatment scores may provide a more accurate estimate of risk than pre-treatment measures. Although different tools not specifically designed to assess risk (e.g., the SAPROF-YV and the PCL: YV) did not add incremental validity to the prediction of recidivism over and above specific risk assessment tools (e.g., the SAVRY and the VRS-YV), it does not mean that the tools are not valuable. While capturing risk level is important, so is assessing different need and responsivity factors. Soderstrom et al. (2020) also found that the protective scale of the SAVRY did not add incrementally to the prediction of risk, but they concluded that assessing protective factors is still important for case management purposes. Alternatively, Shepherd et al. (2014) looked at the incremental predictive validity of the YLS/CMI and the SAVRY and found that both the YLS/CMI and SAVRY individually predicted recidivism, but neither added incrementally to the other. However, they did find that the protective factors scale of the SAVRY added incrementally to the YLS/CMI. In general, most measure pairings examined in the present study did not demonstrate incremental validity, which is likely a reflection of the strong relationship between many of the measures, indicating they are measuring the same underlying construct. However, notably different from this pattern was the pairing of the LSI-SK and the PCL: YV. When paired, both tools were significant for any recidivism, while the LSI-SK was the dominant predictor for nonviolent recidivism and the PCL: YV for violent recidivism. Given the LSI-SK is designed to assess the risk of general recidivism, the incremental prediction of the PCL: YV when looking at violent recidivism may speak to the unique nature of each of these tools. When paired with a more general tool, such as the LSI-SK, the PCL: YV may capture unique variance related to violent risk. In summary, although certain

tools may not add incrementally to the prediction of recidivism, they may assess other information that is valuable when treating young offenders in an effort to prevent future recidivism.

4.2.4 *Calibration*

Calibration, or the examination of the association of risk bands and recidivism, was examined for the VRS-YV, PCL: YV, and the SAVRY. Risk bands clustered, low, medium, and high-risk individuals on the VRS-YV and PCL: YV. For the SAVRY, the risk level assigned during coding was used. In general, for the total sample, there was good calibration for different types of recidivism for all the tools, meaning individuals with higher scores recidivated at a higher and faster rate than individuals with low and medium risk scores, and individuals with medium scores recidivated at a higher and faster rate than individuals with low risk scores. Specifically, the VRS-YV had good calibration for violent recidivism, with low (0-34), medium (35-49), and high-risk (50-69) offenders all significantly different from one another. However, for both non-violent and any recidivism, the medium and high-risk group did not significantly differ, recidivating at rates that were not significantly different, in part, owing to the high base rates of broader outcomes. The calibration of the VRS-YV for violent recidivism is consistent with research from Stockdale et al. (2014), however, in that study all groups were also significantly different for general recidivism.

The PCL: YV demonstrated the opposite pattern to the VRS-YV, where all groups were significantly different for nonviolent and any recidivism, but the medium and high-risk groups did not differ for violent recidivism. While partially consistent with Stockdale et al. (2010), in that study the PCL: YV was significantly different between all levels of risk for violent recidivism, but the medium and high-risk groups did not significantly differ on rates of nonviolent recidivism. The lack of difference between the medium and high-risk groups for certain types of recidivism in the current study could in part be explained by the uneven distribution of individuals into low (0-14), medium (15-24), and high (25-40) groups. Although the risk bands were created by adding approximately +/- 1.00 to the mean, there were few individuals who fell in high range and when they did, they tended to be in the lower end of it. The sample itself was also a fairly high-risk sample, with a high base rate for recidivism. The high base rates of the sample may have made it more difficult to differentiate between medium and high-risk offenders.

For the SAVRY all groups were significantly different for all types of recidivism, which is promising given the risk rating is what is interpreted, not the total score. In contrast to both the VRS-YV and the PCL: YV, which do not have a measure of protection, the SAVRY has the protective factor scale which is not incorporated into the total score but is considered when selecting a risk level. For example, two individuals may have the same score but have different risk levels chosen based on the number of protective factors present (or absent). Thus, the risk level may not always correspond to the same cluster of total scores. Given that the selected risk level (high, medium, or low) is based on clinical judgement (making the SAVRY an SPJ tool), it is important that research be conducted not only on the total score but also on the validity of the risk levels. The current research suggests that both the SAVRY total score and the selected risk level are good predictors of recidivism.

Calibration for the various tools did differ upon examining the various subgroups. In general, the VRS-YV showed a similar pattern for both Indigenous and non-Indigenous individuals as the whole sample, however, there was only one non-Indigenous individual in the high group which limits the generalizability of the findings. Notably, when examining the differences between males and females there did seem to be a consistent trend where medium and high-risk males were not significantly different (mirroring the total sample), but medium and high-risk females were. It appears that males who are medium risk on the VRS-YV recidivate at a similar rate as males who are high risk, however, females who are moderate risk recidivate at a similar rate as females who are low risk.

The SAVRY results seemed to vary by group depending on the type of recidivism. Despite the total sample displaying good calibration across the board, the female rate of recidivism did not differ between groups (even between low risk and high risk) across all types of recidivism. This may in part be due to the low number of females who fell in the low-risk category ($n = 2$) or the lower base rate of recidivism for females. For Indigenous individuals there was good calibration for violent recidivism but not for any or non-violent recidivism. These mixed results may reflect the nature of the tool, a violent risk assessment tool, and thus it may struggle to differentiate the risk level for other types of recidivism with smaller samples.

Finally, the PCL: YV demonstrated better calibration for most groups with respect to violent recidivism. Although there was usually good calibration between the low and medium risk or low and high risk, as with the VRS-YV, females once again evidenced a different pattern

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where calibration was usually much better between medium and high risk. There seems to be a clear pattern where low and medium risk females are grouped together, which may be in part due to the low number of low risk females included in the sample. Low risk females are not typically referred to the YRC, and usually become moderate to high risk before reaching the program. Thus, it is possible that the current study did not accurately capture low-risk females simply because they did not exist in this sample. Finally, the lack of differentiation in recidivism rates between low and medium risk groups may reflect the presence of a single risk group.

4.2.5 *Summary*

To summarize, it seems that the newly developed VRS-YV predicts recidivism as well as previously established youth risk assessment tools, as evidenced by overlapping AUC confidence intervals. All tools perform comparably for violent and non-violent youth and adult recidivism when looking at the total sample, with the exception of the LSI-SK which did not predict violent recidivism as well as the other measures. However, examination of the subsamples evidenced more variability in how well the tools predicted different types of recidivism for different groups. Thus, when choosing a battery of risk assessment measures to use, one will want to consider the type of recidivism needing to be assessed (violent, non-violent, or any) as well as the unique features of the individual. Although there was generally no incremental predictive validity when using more than one tool, one should consider unique aspects of a tool that may contribute information about risk, need, or responsivity factors beyond prediction, as the purpose of risk assessment remains prevention, not prediction.

4.3 VRS-YV Post-Treatment Scores and Treatment Change

The VRS family of tools (the Violence Risk Scale (VRS), Violence Risk Scale – Sexual Offender Version (VRS-SO), Violence Risk Scale – Youth Version (VRS-YV), and Violence Risk Scale – Youth Sexual Offense Version (VRS-YSO); Wong & Gordon, 1999-2003, 2006; Wong et al., 2003; Olver et al., 2016; Stockdale et al., 2014) were developed to bridge the gap between assessment and treatment using a built-in model of change (the transtheoretical model of change, Prochaska et al., 1992). A prominent feature of this study was to add to existing literature regarding the capacity of the VRS-YV to not only assess risk, but to reassess risk during and/or after treatment and capture the role of change in predicting recidivism.

The VRS-YV goes beyond pre- and post-treatment scores, and includes the unique capacity to assess risk-relevant changes during treatment using an adapted stages of change

model, which positions the VRS-YV as a unique and useful tool to use for both assessment and treatment purposes. This can be helpful with demonstrating an objective decrease in risk. Past research indicates that change scores significantly predict violent and sexual recidivism after controlling for base-line level of risk on the VRS-SO for both Indigenous and non-Indigenous offenders (Olver et al., 2007; Olver et al., 2014; Olver et al., 2018; Sowden et al., 2017). Similarly, change scores on the VRS have been significantly associated with reductions in violent recidivism after controlling for base-line risk (Lewis, Olver, & Wong, 2012). Finally, change scores on the VRS-YSO were significantly associated with reductions in general recidivism and uniquely predicted general recidivism when controlling for base-line risk, but did not uniquely predict violent recidivism (Rojas & Olver, 2013). In general, more change as measured on different VRS tools is associated with greater reduction in rates of recidivism.

The dissertation research that Stockdale et al. (2014) is based on, Stockdale (2008), was able to conduct some exploratory analyses on the VRS-YV change score with a small sample (*n* = 22). She found that the change score was negatively correlated with violent recidivism and positively correlated with time to new conviction, although these were not significant relationships. The current research builds on her study as she was unable to look at the predictive ability of the change scores.

Post-treatment data was available for 89 youth in the sample. In general, the predictive accuracy of post-treatment scores for the total sample were in the high range. It should be noted that this is a consistent trend throughout the data, but due to the smaller sample size the confidence intervals were often wider (0.3 spread, versus a 0.2 spread for pre-treatment scores) indicating a wider margin of error due to the smaller sample size. Despite this, the data suggest that post-treatment scores that capture change may be more accurate estimates of risk than the pre-treatment or stable scores for both violent (AUC = 0.65 – 0.80) and non-violent (0.69 – 0.72) recidivism. Before looking at the comparison of the VRS-YV across the diverse populations examined in this study, it should be noted that the post-treatment predictive accuracy should be interpreted with caution. With only 89 individuals in the total sample with enough information to rate post-treatment information, the cell sizes for scores in some subsamples were very small (22 non-Indigenous, 61 Indigenous, and 6 not identified; 75 male and 14 female) and results should be considered exploratory. Post-treatment scores for Indigenous youth were significantly predictive of youth violent recidivism (AUC = 0.75 – 0.78). Although AUC values were in the

small to moderate range for adult and any recidivism (AUC= 0.62 – 0.64) and for all types of non-violent recidivism (AUC = 0.60 – 0.65), they did not reach significance. Alternatively, non-Indigenous post-treatment scores were only significantly predictive of non-violent adult and any recidivism (AUC = 0.90 – 0.91). Again, AUC values were in the small to large range for other types of recidivism, but did not reach significance for any type of violent recidivism (AUC = 0.57 – 0.71) or youth non-violent recidivism (AUC = 0.78-0.79). Alternatively, post-treatment scores for males were almost all significantly predictive (AUC = 0.64 – 0.69) except for the adult total post-treatment score for violent recidivism (although it was small, it was not significant, AUC = 0.63). Finally, post-treatment scores for females were significantly predictive of adult and any violent recidivism (AUC = 0.82 – 0.88) but not youth violent recidivism (AUC = 0.78-0.87) or any type of non-violent recidivism, despite large AUC values (AUC = 0.75 – 0.81). The small cell sizes likely contributed to the variability in the post-treatment results for the different sub-groups, however, in general post-treatment scores appear to be good predictors of a variety of future types of recidivism.

The current research was able to examine some aspects related to treatment change, although there was a relatively small number of individuals who had enough treatment information available to rate post-treatment, there were some interesting findings using the change from pre- to post-treatment information. Of note, the mean change from pre- to post-treatment for the current study was $M = 1.5$, which is a little more than one tenth of a standard deviation of change. In past research on other VRS tools, change varied from one fifth to almost a full standard deviation of change (Lewis, Olver, & Wong, 2012; Olver et al., 2014; Rojas & Olver, 2019). Despite the small amount of change in the current study, the amount of change was predictive of future nonviolent recidivism after controlling for baseline VRS-YV score, indicating that the amount of change an individual makes as recorded on the VRS-YV is an important factor in assessing their future risk for nonviolent recidivism. The significance of post-treatment change in predicting future non-violent non-recidivism suggests that the VRS-YV may be a good tool to incorporate into forensic assessments in general (and not just with violent offenders), as the ability to measure change may be valuable for all types of offenders. While the same results were expected for other types of recidivism, the results were not significant.

While results from the present study are mixed, with change scores uniquely predicting non-violent recidivism but not violent or any recidivism, all results were in the expected

direction. There could be various explanations as to why the change score did not uniquely predict some types of recidivism. As mentioned above, the sample size of individuals with post-treatment rating was small, contributing to a power issue. Additionally, the mean level of change across the total sample was very low, with some individuals even increasing their scores post-treatment. In a sample where the mean level of change is higher, it is likely that the level of change would be a better predictor of future recidivism. Finally, it is also important to note that although it was outside the scope of this study to assess the quality of the treatment received (as this information could not always be gathered), based on information that was available treatment was generally substance management, anger management, forensic treatment, or a specialized treatment (either violence reduction or sexual offense-specific treatment). Taking into consideration that treatment should follow the RNR principles in order to reduce risk, it is likely that treatment received may not have matched the risk level or needs of the individuals thus limiting the amount of change made post-treatment. It is important to continue to explore this avenue of research, and improvements on the VRS-YV pre- and post-treatment could be a unique way of examining adherence of treatment to the RNR model.

4.4 Protective Factors

Research on what constitutes a protective factor has varied, with some suggesting it is the absence of a risk factor (Lodewijks, de Ruiter, & Doreleijers, 2010) and others indicating it is the presence of a separate factor that directly or indirectly reduces risk (Losel & Farrington, 2012). Some researchers (e.g., Rogers, 2000) posit a balanced perspective when assessing risk is necessary to avoid a biased perspective. Protective factors may play a role in risk assessment by helping identify the level of risk by balancing the view, by highlighting different needs, or by identifying specific responsivity factors. Despite the limited research on measures of protective factors, particularly with young offenders, Hanson (2009) suggested that the next generation of risk assessment tools should include a protective factor component.

While other previously developed measures have included measures of protection, such as identifying strengths on the LS family of tools, the protective factors scale of the SAVRY, and absence of treatment targets on the VRS-YV, the SAPROF-YV is the only tool developed specifically to measure protective factors alone. One aim of the current study was to examine the predictive properties of the SAPROF-YV with young offenders and results indicate that there may be value in including the assessment of protective factors in risk assessment. The SAPROF-

YV was able to predict non-recidivism for adult convictions, but did not fare as well with the prediction of youth recidivism. Although there were few significant values when looking at the predictive accuracy of youth violent non-recidivism, the total score and one scale score (motivational) were significant. When looking at adult and any violent non-recidivism, all scores except the external factor score were significant predictors with AUC values in the small to moderate range (0.60 – 0.68). Comparatively, when looking at non-violent non-recidivism all scores were significant predictors of nonviolent youth non-recidivism, and everything but the resilience score was predictive of adult and any nonviolent non-recidivism. The SAVRY protective score evidenced the same pattern; it was not a significant predictor of youth violent non-recidivism but it was for adult and any violent non-recidivism and it predicted non-violent non-recidivism across the board. The AUC values of the SAVRY protective score for the current study were slightly higher than the study by Muir et al. (2020), where the SAVRY protective scale only reached significance for males. The AUC values of the current study for the SAVRY were comparable with research by Viljoen et al. (2018) for both violent and any recidivism, however this study did not include a sample breakdown and thus comparisons between subgroups are not possible.

Of note, this is one of the first studies to look at the predictive accuracy of the SAPROF-YV for new youth and adult criminal convictions. Recent research by Bhanwer (unpublished, 2016) looked at the predictive accuracy of the SAPROF-YV for aggression and Soeterbroek (unpublished, 2019) looked at predicting aggressive incidents in Dutch juvenile at institutions. In a sample of inpatient youth, Bhanwer found that the SAPROF-YV was a significant predictor of verbal aggression but found it was not a significant predictor of any type of aggression in a sample of youth on probation. However, both samples were small ($n = 39$ and 30, respectively) and likely impacted the power of the study, as AUC values for the prediction of major and minor physical and sexual aggression ranged from small to large (0.62-0.82) indicating that the SAPROF-YV may be able to predict different types of aggression, power permitting. Similarly, Soeterbroek found that the SAPROF-YV did not significantly predict physical or verbal aggression in a sample of justice involved Dutch youth, with AUC values that were no different than chance. Recent research by Li et al. (2019) also examined the SAPROF-YV, differentiating between mixed, promotive, and hazard variables. In general, consistent with the present study, they found that the items on the motivational scale tended to have the strongest predictive ability

(as indicated by logistic regression) and were the most protective (as indicated by increased chance of completing probation). Looking to the adult counterpart, the SAPROF, for comparison on the predictive accuracy for new convictions, results of this study are consistent with past adult literature. For example, de Vries Robbé, de Vogel, and de Spa (2011) found that the SAPROF was a strong predictor of non-recidivism while Coupland and Olver (2020) found the SAPROF scores were a significant predictor of violent and general non-recidivism, but there was more variability when using the SPJ rating. In addition, the authors of the latter study note that the sample had a very low number of protective factors present, and when the scores were re-rated post-treatment, and then again at pre-release, there was a stronger link between the SAPROF and non-recidivism. Past research on the SAPROF-YV has found that it may not be a good predictor of aggression, but the current study, consistent with the adult literature, suggests that the SAPROF-YV is able to predict recidivism.

Although it is beyond the scope of this study to delve into why protective factors were not predictive of youth non-recidivism for violence, it is an interesting finding that warrants further comment. It is possible that factors that put someone at risk of violent recidivism overpower the presence of any protective factors as a youth. As an individual develops, protective factors may play more of a role or the impact of risk factors may diminish. Given the total score of the SAPROF-YV was predictive of youth violent non-recidivism, it seems plausible that over time protective factors measured by each factor solidify and play more of a role in preventing recidivism in adulthood. Historically, protective factors have not been a consistent focus of risk assessment or treatment and thus information relating to protective factors may not have been specifically mentioned in the data used for this study. As data become available, future research will help to tease apart the specific role protective factors may play at different stages of development with different types of recidivism.

Results of the current research suggests that the SAPROF-YV is generally a good predictor of future recidivism. The one exception was the external subscale, which was only significantly predictive of youth and adult nonviolent recidivism, and youth general recidivism in the total sample. Research on the adult counterpart (Coupland & Olver, 2020) suggests that some protective factors, such as external protective factors, may play a unique role in risk assessment and protection against future recidivism. While the idea is that the focus would desirably be on increasing the presence of protective factors, the opposite holds true for some external factors,

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where the aim is to decrease their presence (e.g., the goal is to reside in the community, not a secure facility). It is possible that external factors have a different relationship with protection and thus may not be a good predictor of non-recidivism. The current body of research did not re-score the protective factors measures as the Coupland and Olver study did, thus it is difficult to comment on parts of the relationship between the SAPROF-YV and recidivism, however, it is possible that if the SAPROF-YV was re-scored, then a decrease in the external score may actually be predictive of non-recidivism. Conversely, increases on other protective factors would be expected to also be predictive of future non-recidivism. Future research on the SAPROF-YV may explore the specific relationship that the different protective factors have with risk.

4.4.1 *Male and Female Protective Factors*

When examining protective factors by gender, results seemed to vary slightly in comparison with the total sample. Fitting with males being the dominant gender of the sample, protective factors for males mirrored that of the total sample. However, when looking specifically at protective factors for females, the results varied and seemed to depend on type of recidivism. Specifically, the relational subscale of the SAPROF-YV was predictive of no new violent adult or any recidivism whereas the motivational, relational, and total SAPROF-YV scores were predictive of no new non-violent adult, and any recidivism. Research has suggested that violent female offenses are more likely to be relationally based which may be one explanation as to the predictive ability of the relational subscale, specifically when examining violent non-recidivism (Blanchette & Brown, 2006; Robbins, Monahan, & Silver, 2003). Both males and females evidenced a similar pattern as that of the total sample, with protective factors being non-significant predictors of non-recidivism until adulthood.

4.4.2 *Indigenous and non-Indigenous Protective Factors*

It is logical to assume that the arguments that have been made against using risk assessment tools with Indigenous persons that have been normed on non-Indigenous populations will also apply to using protective factors assessment tools, thus the validation of the SAPROF-YV with this diverse population is important. Reflecting on the results of the present study, the prediction of non-recidivism by the SAPROF-YV fared better in the Indigenous sample than it did in the non-Indigenous sample. Due to the discrepancy in sample sizes it is difficult to know whether there is a true difference in the predictive ability or if the analyses were underpowered given the small non-Indigenous sample. Looking at the AUC values for both groups, which are

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similar across the total and factor scores, suggests that the sample size of the non-Indigenous group likely limited the significance of the findings and more research with bigger sample sizes are needed. In general, across both groups, the motivational and relational subscales along with the total score appear to be the best predictors of non-recidivism. Although it was beyond the scope of this research to examine how well the items were able to capture specific Indigenous practices, future research should examine whether specific cultural practices are protective and if so, the next step would be determining if they can be accurately captured on a tool such as the SAPROF-YV, or if a separate tool should be developed. Ongoing consultation with Indigenous Elders and Leaders is necessary to understand how specific ethnocultural practices are best incorporated into assessment of protective factors.

4.5 Gender and Ethnocultural Considerations

One of the major discussions in the literature is the appropriateness of the use of current assessment tools with diverse subpopulations including Indigenous and female youth. Indigenous Peoples have a unique and traumatic history, and are often over-represented in the criminal justice system. Alternatively, females often make up a small portion of those in the criminal justice system, and thus female-specific research is difficult to conduct due to small sample sizes,

4.5.1 *Gender*

Some researchers (Hannah-Moffat & Maurutto, 2003) believe that because females have different pathways into crime, the factors that put them at risk of offending are also different. On the other hand, other researchers suggest that the current approach to risk assessment is "gender neutral" and the tools presently available can be used with both males and females (Andrews et al., 2012; Dowden & Andrews, 1999; Rettinger & Andrews, 2010). Rettinger and Andrews (2010) also suggest that there may be a more gender responsive approach where gender is considered as a specific responsivity factor that may influence what services are the best fit for females and how those services should be provided. The present study examined the predictive accuracy of the tools with both males and females (discussed above) and also compared the scores on the various tools. In general, male and female scores did not significantly differ from each other with the exception of some parts of the SAVRY and SAPROF-YV. Interestingly, when scores were significantly different, females scored higher than males on scores related to risk, and males scored higher than females on scores related to protective factors. Despite potentially having different pathways into crime, males and females are scoring similarly on

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assessment measures. As discussed in detail above, the predictive validity of the various tools is also good for both males and females, suggesting that the current tools available to assess risk are valid to use with young females. However, as evidenced by the calibration analyses of the VRS-YV, females do tend to recidivate at lower rates across all level of risk compared to males. Thus, although the same tools may be used, creating different norms for females may be warranted to adjust for the over-prediction of recidivism based on combined norms. Additionally, although past research on adult females has suggested that females may have different or additional criminogenic needs that should be included in assessment, research is mixed on whether gender specific needs add incrementally to the prediction of recidivism. Rettinger and Andrews (2010) found that many risk factors suggested as specifically relevant to female offending, did not add incrementally to the predictive accuracy of the LS/CMI but they were linked with reoffending (e.g., self-abuse, poverty). These results suggest that gender is important and the assessment of specific female needs may be warranted in addition to major risk factors as it could provide valuable information for case management and intervention specific to females (i.e., how to best meet the responsivity principle).

4.5.2 *Ethnocultural Considerations*

It has long been acknowledged that criminogenic needs and the applicability of risk assessment may differ for Indigenous offenders (Bonta, LaPrairie, & Wallace-Capretta, 1997). Despite this early realization and call for more research, relatively little was done to explore the use of previously established tools with Indigenous offenders. A recent court case, *Ewert v. Canada* (FC, 2015; SCC, 2018), called into question the use of clinical forensic assessment tools with Indigenous inmates in federal custody, renewing the debate about whether forensic measures should be used with this unique population. Since the court case, more research has been conducted that supports the use of various tools with Indigenous offenders but not without caution. Olver et al. (2018) highlight that while the tool they were examining (the VRS-SO) demonstrated predictive accuracy in a population of Indigenous federal offenders, they highlight that although higher risk scores in Indigenous peoples explain some of the variance in the higher base rate of violent recidivism with this population, there is still unique variance left unaccounted for. These authors suggested that there are likely variables and circumstances unique to Indigenous group membership that partly account for higher rates of violent recidivism in this group. Schwalbe et al. (2008) suggest that "omitted variables" (i.e., risk factors that are

disproportionately distributed across racial/ethnic groups that are not measured on standard risk assessment measures) may provide some explanation as to the variance in predictive accuracy between ethnoculturally diverse groups. However, despite acknowledgement that variables unique to Indigenous peoples may exist, there has been relatively little research about what those unique variables might be (Rugge, 2006). With careful consideration of ethnocultural disparities and ethical and responsible use of available measures, valid and reliable assessment of risk in Indigenous peoples with currently available tools that have psychometrically sound research supporting use with Indigenous peoples is possible, and to not use such tools may be a disservice to this group (Olver et al., 2018). Consistent with the Calls to Action (Truth and Reconciliation Commission of Canada, 2015), Indigenous Peoples should continue to be consulted as to how risk assessment tools can be applied in an ethnoculturally sensitive manner.

The ongoing debate about the use of forensic measures with Indigenous offenders extends to young offenders. Exploring the use of the tools chosen for the present study with Indigenous youth lends to the discussion about their reliable and valid use with this diverse population. In general, Indigenous youth had significantly higher scores on all total and factor/component scores than non-Indigenous youth, except the PCL: YV interpersonal and affective scores (no significant difference) and the base rate of Indigenous recidivism was also higher than the base rate of recidivism for non-Indigenous youth. The predictive accuracy of the tools (discussed above) was comparable across groups. Indigenous peoples are diverse individuals and have experienced a long history of systemic abuse that has ongoing impacts through intergenerational trauma, poverty, and deculturalization that places them at greater risk on items assessed by structured risk assessment tools (Gutierrez, Wilson, Rugge, & Bonta, 2013). However, as indicated on the calibration analyses, when it comes to the VRS-YV creating different norms for Indigenous youth may artificially inflate the risk level as low-risk Indigenous youth recidivated more than low-risk non-Indigenous youth, but the opposite is true for high-risk youth. As no tools specific to Indigenous peoples are currently available, and given the poor performance of clinical judgement on level of risk, the use of validated risk tools with careful consideration of ethnocultural risk-need and responsivity factors and calibration for local and specialized subgroups may constitute current best practice. In the end, ethnicity and culture are important and factors unique to Indigenous Peoples' experiences as well as other ethnocultural

groups and should be considered when assessing and interpreting risk assessments and creating treatment plans.

4.6 Service Engagement

Part of treatment change relies on the treatment being provided, however, change also relies on an individual's engagement, internalization, and application of treatment. Although analyzing both internalization and application of treatment were outside the scope of this study, service engagement was broadly examined. No specific measure of treatment readiness or service engagement was used, but other factors coded from file (e.g., number of sessions attended) were correlated with recidivism outcomes in an effort to examine the role of service engagement in risk to reoffend. In general, service engagement as measured by correlation between recidivism (total number of new convictions and yes/no new conviction) and treatment completed (yes/no), number of individual sessions attended, and number of group sessions attended, was almost non-existent. There were only two significant correlations, one between yes/no treatment completed and yes/no nonviolent recidivism and one between yes/no treatment completed and yes/no any recidivism, both moderate correlations. The lack of relationship between treatment and recidivism may speak to some of the issues about the type of treatment offered to individuals included in the present study. As research suggests, adhering to the RNR principle during treatment can reduce recidivism by up to 35% (Andrews & Bonta, 2010). Although the quality of the treatment provided to youth in the current study was not assessed, it is possible that it influenced the relationship between recidivism and treatment. The individual assessment of treatment programs would assist with further understanding of this relationship. Additionally, the information available in files may also explain why little to no relationship was found between recidivism and treatment. Generally, treatment information was not very detailed. Despite over half the sample ($n = 257$) receiving some sort of treatment, only 89 had enough information available to rate post-treatment scores. Another explanation is that those attending treatment were not actually engaging in it, or were more resistant to benefiting from it. Thus, although individuals may have been attending services there was not an association with recidivism.

Some exploration was also conducted to determine if different measures used in the study were related to the likelihood of attending, or not attending, treatment. However, there was no correlation between the presence of protective factors (as measured by the SAPROF-YV and

SAVRY protective scale) and completing or attending treatment. Future research could look at whether recidivism rates vary based on individuals who complete treatment with either high or low levels of protective factors. A more robust measure of service engagement may also be necessary to better examine the relationship between protective factors and treatment. However, given treatment is often mandated, it could also be suggested that individuals will attend and complete treatment regardless of protective factors. The PCL: YV was also examined in a similar manner, and results were the same, there was no relationship between the PCL: YV and attending or completing treatment. Many of the same explanations hold true, ending with the possibility that individuals can have high or low level of traits as measured by the PCL: YV and still attend and complete treatment.

4.7 Strengths and Limitations

Use of real-world archival data, although sometimes messy, is one of the major strengths of this study. The results of this study may be impacted by the high risk and high re-offense rates, which may limit the generalizability of the results, however, high-risk high-needs individuals are often the youth who receive assessment and treatment services, so alternatively the sample may be representative of the youth the tool will most likely be applied to. Additionally, archival data also allowed for a long follow-up period and analysis of the predictive accuracy of both youth and adult recidivism. However, the content of some files limited the strength of some analyses as some important variables were not always able to be coded, or in some instances the entire file could not be coded. Some files were thorough and contained all information necessary to rate the assessment tools, but a little under half of the files did not have enough content to rate the tools. More specifically, many of the files did not contain information specific to ethnocultural factors, leading to much of the sample being left un-coded on this variable and consequently creating a small "non-Indigenous" sample size. The content of the files also limited the quality of information available to examine the post-treatment assessment for the VRS-YV. Treatment information was often minimal and insignificant when re-rating the VRS-YV. While some of the information available from files was limited, there was enough information to score all assessment tools on a large portion of all the files examined leading to a fairly substantial sample size, and a small sub-sample had enough information to rate the VRS-YV post-treatment. Additionally, the interrater reliability was very strong, which lends credibility to the study as there were a large number of files coded by each of the two coders.

However, due to the systematic method used to avoid contamination, it was not possible to complete inter-rater reliability on the treatment files.

An unexpected limitation was the unavailability of the LSI-SK specific information. While the current project had approval for the information, due to unforeseen circumstances the information could not be collected in time for the current research. Although examining the specifics of the LSI-SK were not a major component of this body of research, it would have provided information on a forensic measure for all individuals in the sample. It also would have provided a total score rather than a risk level, although the two map on to each other, the risk level is truncated (0-5) in comparison to the total score. Without the LSI-SK information it was also not possible to look at scores on the LSI-SK subscales, rather the scales could only be coded as present or absent for being a "risk" or a "strength". It is also noted that the LSI-SK is scored by youth workers in the community and thus it was not possible to analyze interrater reliability for this measure. Provincial follow-up data was also unavailable. The provincial data would have provided a more complete review of recidivism data for the sample. By relying solely on CPIC for recidivism information, some recidivists were likely missed, which could have impacted the predictive accuracy of the tools in the study.

Despite the absence of the LSI-SK information, an inherent strength of the current study was its contribution to the existing literature base for established tools including the PCL: YV and the SAVRY. The study was also able to contribute to the growing literature base on the VRS-YV, and provide meaningful insight into the valuable use of a tool that can bridge the gap between assessment and treatment. The current investigation was also able to contribute to the growing discussion of the role of protective factors in risk assessment by examining the psychometric properties of a new measure of protective factors, the SAPROF-YV. Additionally, the large sample size did allow for specific analyses among important subgroups, Indigenous youth and females, often the topic of discussion when talking about the appropriateness of these assessment tools. Unfortunately, comparisons could not be made between Indigenous females and non-Indigenous females or Indigenous males and non-Indigenous males owing to small cell sizes. Due to the small sample size of female youth and the over-representation of Indigenous peoples in the criminal justice system it may be necessary to combine data sets in order to examine the differences between Indigenous and non-Indigenous females.

4.8 Potential Contributions and Future Directions

The present body of research has numerous potential contributions to the field of youth forensic research. First, while the study contributed to the general body of literature supporting the use of several well-established forensic measures, it was the first to examine the SAVRY on a sample of Saskatchewan youth. Additionally, although the LS family has a substantial evidence base, the LSI-SK only has one previous study with a relatively short follow-up period. Given the LSI-SK is scored on every young offender in Saskatchewan, the present study provides valuable information about the use of this tools and offers information about the limited capacity of the tool to assess future violence, indicating youth with violent offenses will likely need more comprehensive assessments.

This study also builds upon the extant research supporting the use of VRS-YV to assess risk for reoffending. The present study extended Stockdale et al.'s (2014) research on the tool, and while both studies support the use of the VRS-YV as a risk assessment tool, the current study provided preliminary support for the capacity of the tool to assess change. Further investigation regarding the tool's capacity to assess treatment-related change is needed. The VRS-YV's structured mechanism to assess change is a unique aspect that could play a valuable role in improving the quality of treatment provided to young offenders.

A final novel contribution was the examination of how well the SAPROF-YV predicts recidivism. The SAPROF-YV appears to have promising psychometric properties linking it to the assessment of risk and prediction of recidivism and additional research could provide a unique and balancing role in the current approach to risk assessment. As mentioned above, external factors are seen as having a unique relationship with change, as one typically wants them to decrease as things improve. Future research could explore the relationship of specific protective factors with risk. Additionally, examining the relationship of change in protective factors with risk of recidivism could assist with understanding the role of protective factors in risk assessment and treatment. More specifically, further research may lend to the potential of focusing treatment on increasing the presence of protective factors as a way to reduce risk.

Finally, continuing to examine the specific role of ethnicity and gender in risk assessment is important to the ability to provide the best case management to all young offenders. Ideally, future research could look at whether risk varies systematically with levels of cultural engagement and find ways to code ethnicity and culture in a more meaningful way.

Ethnocultural communities, healers, and knowledge keepers should be consulted as research in this area accumulates. Similarly, although sex and gender are used interchangeably in the literature, they are socially different constructs. Fully understanding the role of sex and gender may require exploring these as more than binary variables.

4.9 Final Words

The assessment of risk, need, responsivity, protective factors, and the impact of change are important areas of research with the potential to have clinically meaningful impacts. With evidence that the VRS-YV and SAPROF-YV are psychometrically sound tools, they have the ability to close some of the pre-existing gaps in youth risk assessment and assist front-line staff in efforts to reduce risk of future recidivism. These findings may be clinically meaningful for not only youth as a whole, but also diverse populations often not included in the original development of forensic measures. Better understanding of which tools to use with specific populations could lead to providing better treatment interventions, in turn reducing recidivism rates of justice involved youth, and helping to prevent entry into the adult justice system.

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Name: _____   Client #: _____

Pre-Treatment Rater: _____   Pre-Treatment Rating Date: _____

Post-Treatment Rater: _____   Post-Treatment Rating Date: _____

VRS:YV Score Sheet

Stable Factors

I or N[†]

S1	Early Onset of Serious Antisocial Behaviors	0	1	2	3	_____
S2	Criminality	0	1	2	3	_____
S3	Instability of Family Upbringing	0	1	2	3	_____
S4	Exposure to Antisocial Behavior in the Family	0	1	2	3	_____

Total Stable Factor Score before Treatment: _____

Total Stable Factor Score after Treatment: _____
(only if there are changes to S1 or S5)

[†] *If it is necessary to omit rating a Stable or Dynamic Factor, the rater should indicate whether the omission is because there is insufficient information (I) or because the item is not applicable (N).*

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1

FOR STAGE OF CHANGE:
P/C = Precontemplation/Contemplation[†]
P = Preparation
A = Action
M = Maintenance

Use these symbols to indicate
the Stage of Change:
O = Pre-treatment
X = Post-treatment

# of Stages changed:
no change = 0
1 stage = .5
2 stages = 1.0
3 stages = 1.5

DYNAMIC FACTORS AND TOTAL SCORES

RATINGS

		Pre-Tx (a)	Stage of Change[†]	# of Stages changed x .5 (b)	Post-Tx (a-b)[††]	I or N
D1	Violent Lifestyle	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D2	Callous and Unemotional	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D3	Criminal Attitudes	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D4	Attitudes toward Education	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D5	Antisocial Peers	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D6	Interpersonal Aggression	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D7	Emotional Control	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D8	Violence During Institutionalization	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D9	Weapon Use	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D10	Insight into Violence	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D11	Mental Disorder	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D12	Substance Abuse	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D13	Impulsivity	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D14	Cognitive Distortions	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D15	Interaction with Caregivers	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D16	Family Stress	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D17	Social Isolation	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D18	Community Stability	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____
D19	Compliance with Supervision	0 1 2 3	P/C P A M	1.5 1 .5 0	____	____

Pre-Tx:	← Total Dynamic Factor → Score	Post-Tx:
	← Total Stable Factor → Score From Previous Page	
	← Total Stable + Total → Dynamic Factor Score	

Indicate if Clinical Override was used:

Yes O   No O

[†] For treatment purposes, specify whether the client is in Precontemplation or Contemplation stage by circling (O) or marking (X) the 'P' **or** 'C' stage for pre- and post-treatment, respectively.

[††] If there is a deterioration during treatment, the 'b' score is added to the 'a' score for the corresponding Dynamic Factor.

2

Each of the following PCL-YV items is rated on a 3-point ordinal scale (2, 1, or 0) based on the degree to which the personality and behavior of the adolescent matches the item description given in the scoring manual. Scores of 2, 1, and 0 are defines as follows:

2   The item applies to the youth; a reasonably good match in most essential respects; his/her behavior is generally consistent with the flavor and intent of the item.

1   The item applies to a certain extent but not to the degree required for a score of 2; a match in some respects but with too many exceptions or doubts to warrant a score of 2; uncertain about whether or not the item applies; conflicts between interview and file information that cannot be resolves in favor of a score of 2 or 0.

0   The item does not apply to the youth; he/she does not exhibit the trait or behavior in question, or he/she exhibits characteristics that are opposite of, or inconsistent with, the intent of the item.

1.	Impression management	**0**	**1**	**2**	**X**
2.	Grandiose sense of self worth	**0**	**1**	**2**	**X**
3.	Stimulation seeking	**0**	**1**	**2**	**X**
4.	Pathological lying	**0**	**1**	**2**	**X**
5.	Manipulation for personal gain	**0**	**1**	**2**	**X**
6.	Lack of remorse	**0**	**1**	**2**	**X**
7.	Shallow affect	**0**	**1**	**2**	**X**
8.	Callous/lack of empathy	**0**	**1**	**2**	**X**
9.	Parasitic orientation	**0**	**1**	**2**	**X**
10.	Poor anger control	**0**	**1**	**2**	**X**
11.	Impersonal sexual behavior	**0**	**1**	**2**	**X**
12.	Early behavior problems	**0**	**1**	**2**	**X**
13.	Lacks goals	**0**	**1**	**2**	**X**
14.	Impulsivity	**0**	**1**	**2**	**X**
15.	Irresponsibility	**0**	**1**	**2**	**X**
16.	Failure to accept responsibility	**0**	**1**	**2**	**X**
17.	Unstable interpersonal relationships	**0**	**1**	**2**	**X**
18.	Serious criminal behavior	**0**	**1**	**2**	**X**

19.	Serious violations of conditional release	**0**	**1**	**2**	**X**
20.	Criminal versatility	**0**	**1**	**2**	**X**

List of Items for the Structured Assessment of Violence Risk in Youth (SAVRY)

Risk factors

Historical risk factors
1. History of Violence
2. History of Non-Violent Offending
3. Early Initiation of Violence
4. Past Supervision/Intervention Failures
5. History of Self-Harm or Suicide Attempts
6. Exposure to Violence at Home
7. Childhood History of Maltreatment
8. Parental/Caregiver Criminality
9. Early Caregiver Disruption
10. Poor School Achievement

Social/Contextual risk factors
11. Peer Delinquency
12. Peer Rejection
13. Stress and Poor Coping
14. Poor Parental Management
15. Lack of Personal/Social Support
16. Community Disorganization

Individual risk factors
17. Negative Attitudes
18. Risk Taking/Impulsivity
19. Substance Use Difficulties
20. Anger Management Problems
21. Low Empathy/Remorse
22. Attention Deficit/Hyperactivity Difficulties
23. Poor Compliance
24. Low Interest/Commitment to School

Protective factors

P1. Prosocial Involvement
P2. Strong Social Support
P3. Strong Attachments and Bonds
P4. Positive Attitude Towards Intervention and Authority
P5. Strong Commitment to School
P6. Resilient Personality Traits

APPENDIX D

List of Items for the Structured Assessment of Protective Factors (SAPROF): Youth Version

Resilience items

1. Social competence
2. Coping
3. Self-control
4. Perseverance

Motivational items

5. Future orientation
6. Motivation for treatment
7. Attitudes towards agreements and conditions
8. Medication
9. School/work
10. Leisure activities

Relational items

11. Parents/guardians
12. Peers
13. Others supportive relationships

External items

14. Pedagogical climate
15. Professional care
16. Court order

Participant identification #:

Demographic and Background Information

Date of Birth (dd/mm/yyyy): _____

Sex (M/F):

Education (years): _____

Attending school at time of arrest? (Y/N)

Ever suspended/expelled? (Y/N)

Employment Record:
1) Never employed
2) Frequently unemployed (sporadic short-term jobs and long periods of unemployment)
3) Never employed 1 full year
4) Fulltime employment minimum 2 years

Employed at time of arrest? (Y/N)

Current living situation:
1) Natural birth parents
2) Single parent household
3) Other relatives (e.g., grandparents)
4) Foster care
5) Add as needed

Ethnicity:
1) Caucasian
2) Aboriginal
3) Add as required

Sentencing Information
List current convictions (index sentence): _____

_____

_____

_____

Index Sentencing Date (dd/mm/yyyy) (if multiple dates, code the earliest date): _____

Index Sentence Length: _____

Sentence Type:
1) Closed/secure custody

2) Open custody
3) Probation

Ever served a period of custody? (Y/N) (if so, was it Closed/Open?)

Total number of index convictions: _____

Index offense type (circle all that apply):
1) Nonviolent nonsexual
2) Violent nonsexual
3) Sexual (contact offense)
4) Non-contact Sexual

Criminal History

*Count convictions occurring *prior* to the Index Sentence only

Date of first conviction (dd/mm/yyyy) _____

Date of first violent (nonsexual) conviction (dd/mm/yyyy) _____

Date of first sexual (any) conviction (dd/mm/yyyy) _____

Any prior non-adjudicated sex offenses? (Y/N) If so, approximate date or age of youth (dd/mm/yyyy): ___
_____

Previous Convictions
Any previous convictions? (Y/N)
Any previous violent (nonsexual conviction(s)? (Y/N)

Total previous violent (nonsexual) convictions: _____

Total previous nonviolent (nonsexual) convictions: _____

Total previous nonsexual convictions: _____

Any previous sexual conviction(s)? (Y/N)
Total previous sexual convictions: _____
Sum all previous convictions (non-violent + violent + sexual) = _____
Total previous sentencing occasions: _____

Criminal Information Pertaining to Previous and Current Offenses

History of Escapes/Breaches
Any prior breaches? (Y/N)
Total prior breaches: _____
Any attempted/completed escape from a youth justice facility? (Y/N)

Services Received

Any DSM diagnosis (Y/N) on file?

If so, please list all DSM diagnoses: _____

_____

_____

Services Received at Child and Youth Services, Young Offender Program (circle all that apply)

1) Psychological assessment
2) Individual treatment
3) Group treatment

Assessment Services

Intelligence Testing (Y/N):

Test(s) administered (please specify if WAIS, WISC, WASI, K-ABC) _____

_____

Overall standard score(s): _____

Personality/Psychopathology Testing (Y/N):

Test(s) administered (please specify if Jesness, MMPI-A, Adolescent Psychopathology Scale,

Interpersonal Behavior Survey, BPI, or specific aggression measure):_____

_____

_____

Psychoeducational Testing (Y/N):
Test(s) administered (please specify if WRAT, WIAT, Woodcock-Johnson) _____

_____

Reading achievement standard score + approximate grade level: _____

Arithmetic achievement standard score + approximate grade level: _____

Writing achievement standard score + approximate grade level: _____

Overall standard score (if available) + approximate grade level: _____

Current (actual) grade level? _____

Received a court ordered assessment (order for examination)? (Y/N)
Estimation of appraised level of risk for recidivism mentioned in report? (Y/N)
If so, level of risk appraised in report (e.g., medium or moderate, etc.): _____

Individual Treatment Services

Received individual therapy? (Y/N)
Approximate number of sessions attended: _____

Group Treatment

Please list any groups attended (not necessarily completed) at CYS: _____

_____

_____

_____

*Please complete the following information for every group the youth has attended (continue on reverse if needed):

Group name: _____

Specialized group? Y/N (please specify, e.g., sex offender, violent offender) _____

_____

Group start date (first session) (dd/mm/yyyy) _____

Group finishing date (last session) (dd/mm/yyyy) _____

Approximate number of sessions attended: _____

Successfully completed (as evaluated by group leader)? (Y/N)

Recidivism Information

*Please use official criminal record for coding these offenses

Date of release (dd/mm/yyyy) (if the youth has received a period of probation, this would be the (most recent) index sentencing date): _____

Date of first conviction (dd/mm/yyyy): _____

Date of first violent (nonsexual) conviction (dd/mm/yyyy): _____

Date of first sexual conviction (dd/mm/yyyy): _____

Total new nonviolent nonsexual convictions: _____

Total new violent nonsexual convictions: _____

Total new nonsexual convictions: _____

Total new sexual convictions: _____

Total new convictions (nonviolent + violent + sexual): _____

Total serious convictions (violent + sexual) = _____

Any arrests or charges that did not result in conviction or sentencing? (Y/N)
Please specify type and number:

Nonviolent (nonsexual): _____

Violent (nonsexual): _____

Sexual: _

Any custody placement upon sentencing? (Y/N)
If so, length of (first) custody placement: _____

Type of sentencing for first conviction (in the case of multiple placements, please circle the most restrictive one received):
1) Closed/Secure
2) Open
3) Probation