The Predictive Validity of the Saskatchewan Primary Risk Assessment (SPRA)

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The Predictive Validity of the Saskatchewan Primary Risk Assessment (SPRA)

Executive Summary

The Saskatchewan Primary Risk Assessment (SPRA; CPSP, 2009) is a 15-item assessment measure. For the full SPRA measure, see Appendix A. The SPRA was created as an assessment measure for general recidivism in both male and female adult offenders under the jurisdiction of the Ministry of Corrections and Policing, Ministry of Justice. This study was commissioned by the Saskatchewan Ministry of Justice to address three points of interest: confirmation of the overall predictive validity of the SPRA; an exploration of the criminogenic needs assessed by the SPRA and their relationship to reoffending; and an exploration of whether additional risk categories can be determined. The study addressed these issues by examining offender information that was collected from all Saskatchewan provincial offenders, both with probation-after-custody (PAC) and community/conditional (CC) sentences.

Descriptive statistics were generated on several characteristics, including age groups, sex, classification (i.e., PAC or CC sentences), ethnicity, level of education, custodial sentence lengths, community sentence types, risk levels, and recidivism sentence types. The overall predictive validity of the SPRA was determined in conjunction with other statistical analyses to explore the criminogenic needs assessed by the SPRA, as well as their relationship to reoffending. The three current risk levels were examined and exploratory analyses were completed to determine if a fourth risk level (i.e., very high risk) could be developed and whether it would be useful for rehabilitative services.

The sample was derived from a cohort of male and female offenders in Saskatchewan, Canada who were under the responsibility of the Ministry of Corrections and Policing, Ministry of Justice, whose index sentence started in one calendar year (2009). Offenders were categorized as either PAC or CC offenders based on the nature of their index sentence: PAC offenders received a custodial sentence followed by a community sentence, while CC offenders only received a community sentence for their offence. The data were extracted on June 21, 2012. All members of the cohort had been administered a SPRA in conjunction with their sentence. The sample initially contained 3,304 individuals, but twenty-six cases were removed due to errors regarding the time sequence between their custody and probation start dates. Two further cases were removed due to incomplete SPRAs. The final sample contained 3,276 offenders.

Results indicate that although the internal consistency reliability for the SPRA is low, strong and significant correlations were found between recidivism variables and the SPRA total score and the current and proposed risk levels. The addition of the very high risk level has demonstrated empirical support for its use in Saskatchewan Corrections. It is recommended that future research explores the inclusion of more items that are more explicitly related to the empirically based criminogenic needs as discussed by Andrews et al. (1990). Ideally, the SPRA items should reflect all the aspects of criminogenic needs and should accurately predict recidivism. This endeavor will therefore not only affect the SPRA's ability to use the relationship between the criminogenic needs and recidivism to predict recidivism, but also to increase the internal consistency measure of reliability (Cronbach's alpha) to the commonly acceptable level.

INTRODUCTION

Recidivism is defined as "a return to criminal activity, usually measured by arrest, after being convicted of a criminal offense" (Bartol & Bartol, 2008). Recidivism has been studied extensively, with areas of concern ranging from general recidivism to recidivism in specific types of offenses, to the reasons for recidivism and factors that exist to support it. In an effort to address the issue of recidivism in a practical setting, instruments have been developed to predict the likelihood of an offender reoffending. The Saskatchewan Primary Risk Assessment (SPRA) is one such prediction measure of general recidivism, and is used by the Ministry of Corrections and Policing, Ministry of Justice, formerly the Ministry of Corrections, Public Safety and Policing (CPSP) of Saskatchewan. It is important and useful for rehabilitative systems to have a measure of recidivism, as it not only predicts the possibility of reoffending, but it also indicates criminogenic needs of the offender.

The Saskatchewan Primary Risk Assessment (SPRA)

The Saskatchewan Primary Risk Assessment (SPRA; CPSP, 2009) is a 15-item assessment measure that was modeled after the principles of risk, need, and responsivity (RNR; Andrews, Bonta, & Hoge, 1990). For the full SPRA measure, see Appendix A. The SPRA was created as an assessment measure for general recidivism in both male and female adult offenders under the jurisdiction of the Ministry of Corrections and Policing, Ministry of Justice. The SPRA was developed from two previous risk assessment measures.

Created in Wisconsin in 1979, the Wisconsin Case Classification System (WCCS; CPSP, 2009) was created to predict general recidivism in adult offenders. It was later adopted and revised by the Manitoba Community and Youth Services becoming the Primary Risk Assessment (PRA), containing 15 of the 21 original WCCS items (CPSP, 2009). After it had been used in the Manitoba provincial corrections, the PRA was established as having better predictive validity than the original WCCS (Bonta, Pang, Parkinson, Barkwell, & Wallace-Capretta, 1994).

The PRA was then adopted by adult corrections in Saskatchewan in the late 1990s. A validation study found that the PRA was effective in predicting recidivism (O'Bourne, 2003). Although these preliminary results were promising for the future use of the PRA in Saskatchewan Corrections, some items were later discarded on account of a lack of theoretical or statistical basis (CPSP, 2009). As such, a revised version, the SPRA, was implemented in Community Corrections in 2007, and in one custody facility in 2009.

Since its implementation, the SPRA has been used primarily with provincial offenders requiring a Pre-Sentence Report and all provincial offenders sentenced to a community disposition (e.g., probation, conditional sentence). Starting in 2009, the SPRA has been used to assess future recidivism for all female offenders with a custodial sentence. The purpose of the SPRA is to provide information on the offender's risk level for future recidivism in addition to identifying the offender's criminogenic needs that will later be addressed in case planning. To complete the SPRA on an individual offender, an in-depth interview is conducted in addition to an extensive file review. Information regarding the offender's friends and relatives is also collected (CPSP, 2009).

Risk levels (i.e., low, medium, or high) are assigned to each offender based on their numerical score on the SPRA. The risk level applies to general recidivism, not to specific recidivism such as sexual offending or intimate partner violence. These ratings provide information for the type and intensity of treatment needed for the offender, as well as recidivism rates per category. Percentile ranks are used for reporting the results of the SPRA, indicating how the offender compares to other offenders previously assessed upon the SPRA (CPSP, 2009). Total scores on the SPRA from zero to five are categorized as low risk, total scores from six to 11 are categorized as medium risk, and total scores from 12 to 22 are categorized as high risk. Based on research with Saskatchewan offenders, recidivism rates for the risk levels are identified as: 20% for low risk, 50% for medium risk, and 80% for high risk over a three year period in the community (CPSP, 2009).

The Current Investigation

This study was commissioned by the Saskatchewan Ministry of Justice to address three points of interest: confirmation of the overall predictive validity of the SPRA; an exploration of the criminogenic needs assessed by the SPRA and their relationship to reoffending; and an exploration of whether additional risk categories can be determined. The scope of the study was therefore limited to these three points.

The study addressed these issues by examining offender information that was collected from Saskatchewan provincial offenders, both in community and in custody. Descriptive statistics were generated on several demographic and legal characteristics, including age groups, sex, classification (i.e., custody or community), ethnicity, level of education, custodial sentence lengths, community sentence types, risk levels, and recidivism sentence types. The overall predictive validity of the SPRA was determined in conjunction with other statistical analyses to explore the criminogenic needs assessed by the SPRA, as well as their relationship to reoffending. The three current risk levels were examined and exploratory analyses were completed to determine if a fourth risk level (i.e., very high risk) could be developed and whether it would be useful for rehabilitative services.

METHODOLOGY

Sample

The sample was derived from a cohort of offenders in Saskatchewan, Canada who were under the responsibility of the Ministry of Corrections and Policing, Ministry of Justice. The original cohort included all male and female offenders whose index sentence started in one calendar year (2009) and had a SPRA completed. Offenders were categorized as either probation-after-custody (PAC) or community/conditional (CC) offenders based on the nature of their index sentence: PAC offenders received a custodial sentence followed by a community sentence, while CC offenders either received a conditional or probation sentence for their offence. The data were extracted on June 21, 2012. All members of the cohort had been administered a SPRA in conjunction with their sentence. The sample initially contained 3,304 individuals. Twenty-six cases were removed due to errors regarding the time sequence between their custody and community start dates. Two further cases were removed due to incomplete SPRAs. The final sample contained 3,276 offenders.

The majority of offenders were male (2,522, 77.0%), with a smaller percentage of female offenders (752, 22.9%) and two offenders with missing gender information. The majority of all offenders were in the age group of 20 to 39 at the date of extraction (2,308, 70.5%), with fewer offenders in the age groups of 40 to 59 (879, 26.8%), 60 to 79 (84, 2.5%), and 80 to 99 (5, 0.2%). The ethnicities of the offenders were categorized into Status (1,541, 47.1%), Non-Status (148, 4.5%), and Métis (329, 10.0%), followed by Non-Aboriginal (986, 30.1%) and Unknown (272, 8.3%). For the highest level of education achieved, most offenders achieved less than high school (1,898, 57.9%), while others completed high school (891, 27.1%), continued their education past high school (264, 8.1%), or had unknown or missing information (223, 6.9%). As described above, the sample was split between PAC (202, 6.2%) and CC offenders (3,074, 93.8%). For the offenders who received a PAC sentence, the average custodial sentence length was 159.7 days, with a range of 4 to 982 days. Unexpectedly, there was one offender with a custodial sentence length of 982 days.

Prediction and Outcome Measures

The SPRA. The Saskatchewan Primary Risk Assessment (SPRA; Saskatchewan Ministry of Corrections, Public Safety, and Policing, 2009) is a 15-item measure designed to assess and predict the risk of general recidivism among provincial offenders in Saskatchewan, Canada. Before starting the assessment, there are five possible reasons for assessors to indicate why the SPRA was completed: court report, probation supervision, conditional sentence, bail, or jail. The items of the SPRA, representing both static and dynamic risk factors, are scored on a 0-1, 0-2, or 0-3 scale depending on the possible options. For the full list of items, see Appendix A. These items are summed to create a total score ranging from 0 to 22. The total scores are used to determine the individual's risk level for future recidivism. Low risk offenders can have a total score from 0 to 5, medium risk offenders can have a total score from 6 to 11, and high risk offenders can have a total score from 12 to 22.

In consultation with the Ministry of Corrections and Policing, Ministry of Justice, a fourth risk category, very high, was introduced in an exploratory manner to determine if there was empirical support for its use. The score ranges for low and medium risk offenders remained the same at 0 to 5 and 6 to 11, respectively. The score range for high risk offenders was changed to 12 to 16 and the very high risk comprised offenders with scores from 17 to 22. The proposed score cut-off of 17 was chosen as it is the halfway point between 12 and 22. Analyses were conducted first with the current risk levels (i.e., low, medium, and high) and then with the proposed risk levels (i.e., low, medium, high, and very high).

Recidivism. For the purpose of the current study, recidivism was defined as any criminal offence for which the offender was returned to the custody of the Ministry of Corrections and Policing, Ministry of Justice. Four measures of recidivism were created from the offender information on file with the Ministry of Corrections and Policing, Ministry of Justice. The first was a dichotomous variable (yes = 1, no = 0) to indicate whether or not the individual had recidivated. The second variable was the time to recidivate. For the CC offenders, this time was measured in days between their SPRA assessment date and the warrant start date for their recidivism offence. For the PAC offenders, this time was measured in days between release to the community following their custodial sentence and the warrant start date for their recidivism offence.

A third variable was created for the offenders who did not recidivate, representing their survival time in the community. For the CC offenders, this time was measured in days between their SPRA assessment date and the recidivism data extraction date for this study. For the PAC offenders, this time was measured in days between the start of their community sentence attached to their custodial sentence and the extraction date. A fourth (hybrid) variable was then created to combine information from the CC recidivists, CC non-recidivists, PAC recidivists, and PAC non-recidivists all in one variable, combining the values from the above two variables into one. As such, this variable contained the time to recidivate for both PAC and CC recidivists, and the total follow-up time for the PAC and CC non-recidivists. This variable was derived in order to conduct survival analyses.

Procedure

Offenders who started either a PAC or CC sentence and had a SPRA completed between January 1st and December 31st, 2009 were electronically identified by the Ministry of Corrections and Policing, Ministry of Justice's tracking and information system and were included in the study. Demographic information was obtained for age, ethnicity, sex, and their highest level of education achieved. Information on the offender's PAC sentence start date, CC sentence start date, CC sentence type, SPRA assessment date, SPRA total score, and SPRA risk level was also obtained. All SPRA assessments were completed in 2009. For PAC offenders, the SPRA was completed as part of their sentence via the Pre-Sentence Report or while in custody for female offenders. For CC offenders, the SPRA was completed as part of their sentence via a Pre-Sentence Report or after their probation start date. All SPRA assessment dates were verified as being completed prior to the recidivism offence start date. All offenders were followed up until the data extraction date, June 21, 2012, where information on the offenders' recidivism offences was obtained.

Data Analysis. The primary focus of this investigation was to determine the predictive validity of the SPRA for future recidivism for all offenders. Frequencies of demographic information were calculated and compared between all offenders. Internal consistency of the SPRA was determined using Cronbach's (1951) coefficient alpha. To determine the predictive validity of the SPRA, correlations, ROC curves (Hanley & McNeil, 1983), and survival graphs were conducted for all offenders. Predictive validity statistics were calculated for the SPRA raw scores, as well as the three- and four-level risk groups. Analyses were further broken down into groups by age, sex, ethnicity, recidivists and non-recidivists, and PAC or CC offenders.

RESULTS

Demographics

Sex and Age. The sample consisted of 3,276 offenders. Of that, 752 were female, 2,522 were males, and two offenders with missing information (see Table 1). All tables can be viewed in Appendix B. At the time of data extraction, the majority of the sample (70.5%) was between 20 and 39 years of age. There were 26.5% of offenders between the ages of 40 and 59, with the rest of the sample aged 60 and older (see Table 2). Approximately 70% of the 2,522 male offenders were between the ages of 20 and 39. Twenty seven percent of males were between 40 and 59 and the remaining males were aged 60 and older (see Table 3). Of the female offenders, 72% were between the ages of 20 and 39, 26% were between the ages of 40 and 59, and 2% were aged 60 or older (see Table 4).

Ethnicity. Offenders' ethnicities included Métis (10%), Non-Aboriginal (30.1%), Non-Status (4.5%), Status (47.1%), and Unknown (8.3%) (see Table 5). Table 6 shows that of the male offenders, approximately 10% were Métis, 34.1 % were Non-Aboriginal, 4.8% were Non-Status, 43.9% were Status, and the rest were unknown. Table 7 shows that of the female offenders, approximately 57.6% were Status, 17% were Non-Aboriginal, 12% were Unknown, 11% were Métis, and the rest were Non-Status. Of the 202 PAC offenders, approximately 58% were Status, 23.8% were Non-Aboriginal, 12% were Métis, 6.9% were Non-Status and 0.6% were Unknown (see Table 8). Of the 3,074 CC offenders, approximately 46.3% were Status, 30.6% were Non-Aboriginal, 9.9% were Métis, 8.8% were Unknown, and 4.4% were Non-Status (see Table 9).

Education. Of all offenders, 27% achieved grade 12, 22% achieved grade 10, 2.8% achieved Some University, 1% achieved each of grades two through to five, business school, technical school, and University Degree, and 6.7% of the offenders' highest education levels were unknown levels of education (see Table 10). Table 11 and Table 12 show the breakdown of education levels for male and female offenders, respectively.

Internal Consistency Reliability. The Cronbach's alpha for the 15 scored items of the SPRA was $\alpha = 0.627$, which would be considered a low level of internal consistency reliability.

Offender Location and Sentences

PAC and CC. Table 13 shows the frequencies of offenders categorized by their sentence types of PAC or CC, with the vast majority of the sample (93.8%) having CC sentences. Of the 202 offenders with PAC sentences, 92.5% were male (see Table 14), with fifteen or 7.4% being female (see Table 15). Frequencies of age groups with PAC and CC sentences are shown in Table 16. Table 17 shows the categorization of PAC and CC offenders using both the current SPRA risk levels and the proposed SPRA risk levels as developed in the current study. Using the current risk levels, there were 4.5% of PAC offenders in the low risk level, 37.6% in the medium risk level, and 57.9% in the high risk level. There were 15.9% of CC offenders in the low risk level, 54.8% in the medium risk level, and 29.3% in the high risk level. A Chi Square test of independence revealed that the difference in proportions between the current SPRA risk levels

for PAC and CC offenders was significant, χ^2 (2, N = 3,276) = 77.063, $p < .001$, with CC offenders more likely to be low and medium risk and probation-after–custody offenders more likely to be high risk.

Using the proposed risk levels, there were 4.5% of PAC offenders in the low risk level, 37.6% in the medium risk level, 47% in the high risk level, and 10.9% in the very high risk level. There were 15.9% of CC offenders in the low risk level, 54.8% in the medium risk level, 26.5% in the high risk level, and 2.8% in the very high risk level. A Chi Square test of independence revealed that the difference in proportions between the proposed SPRA risk levels for the PAC and CC offenders was also significant, χ^2 (3, N = 3,276) = 94.522, $p < .001$, with CC offenders more likely to be low and medium risk and probation-after–custody offenders more likely to be high and very high risk.

Index PAC Sentence Lengths. Custodial sentence lengths were at a minimum of one month and a maximum of two to three years (see Table 18). The most frequent custodial sentence length was between six months and one year (24%), followed by two months (17%) and one month (13%). The length of custodial sentences for males and females are shown in Tables 19 and 20, respectively.

Index CC Sentence Types. All offenders had one of four types of CC sentences: PR Community Service (probation order with a community service condition), Conditional Sentence, PR Reporting (probation order with a report to Probation Officer condition), and PR Restitution (probation order with a restitution condition) (see Table 21). PR Reporting was the most frequent index CC type (68.4%), followed by Conditional Sentence (27.4%). Table 22 shows the breakdown of CC sentence types for males and females. A Chi Square test of independence on CC sentence types revealed a significant difference between males and females, χ^2 (3, N = 3,274) = 37.923, $p < .001$, with males receiving more conditional sentences.

SPRA Risk Levels: Frequencies Overall and by Gender and Ethnicity

The current SPRA risk levels consist of low, medium, and high risk levels. This study sought to develop a fourth very high level. This section shows the results of the two categorizations of the sample, current and proposed SPRA risk levels. Table 23 shows that with the current SPRA risk levels there was 15.2% of the sample in the low risk level, 53.8% of the sample in the medium risk level, and 31% in the high risk level. A Chi Square test of independence revealed that the difference in proportions of males and females in the current SPRA risk levels was significant, χ^2 (2, N = 3,274) = 24.213, $p < .001$, with females more likely to be low and medium risk and males more likely to be high risk. With the proposed SPRA risk levels, the score cutoffs for the low and medium risk levels did not change. Whereas the current high risk level contained 31% of the sample, the proposed high risk level contained 27.7% of the sample, and the very high risk level contained 3.3% of the sample (see Table 24). A Chi Square test of independence revealed that the difference in proportions of males and females in the proposed SPRA risk levels was significant, χ^2 (3, N = 3,274) = 24.233, $p < .001$, with females more likely to be low and medium risk and males more likely to be high and very high risk. The breakdowns of male and female offenders in the current and proposed risk levels are displayed in Table 25.

There were five divisions of ethnicities in the sample: Métis, Non-Aboriginal, Non-Status, Status, and Unknown. Table 26 shows the breakdown of ethnicities across the current and proposed risk levels. A Chi Square test of independence revealed that the difference in proportions of offenders with different current SPRA risk levels was significant by ethnicity, χ^2 (8, N = 3,276) = 299.995, $p < .001$, with Non-Aboriginal offenders being more likely to be low risk, and Status, Non-Status and Métis offenders being more likely to be high risk. A further Chi Square test of independence was run and the difference in proportions between the proposed SPRA risk levels and ethnicity was again significant, χ^2 (12, N = 3,276) = 308.641, $p < .001$, with Non-Aboriginal offenders being more likely to be low risk, and Status, Non-Status and Métis offenders being more likely to be high risk.

Recidivists and Non-Recidivists

Table 27 shows the proportion of the sample that recidivated as opposed to those who did not. A total of 2,240 offenders in the sample (68.4% of the sample) did not recidivate, while 1,036 offenders (31.6%) did. Table 28 shows that of the 3,074 CC offenders, 916 (29.8%) recidivated and 2,158 (70.2%) did not recidivate. Likewise, of the 202 PAC offenders, 120 (59.4%) recidivated and 82 (40.6%) did not recidivate. A Chi Square test of independence revealed that the difference in proportions of PAC recidivists, PAC non-recidivists, CC recidivists, and CC non-recidivists are all significantly different χ^2 (1, N = 3,276) = 76.842, $p < .001$, with PAC offenders reoffending in shorter time periods than CC offenders. Table 29 shows the average follow-up time and range for the overall sample. As shown, CC offenders who recidivated had an average follow-up time of 1,108 days, with a range of 903 to 1,266 days. CC offenders who did not recidivate had an average follow-up time of 1,001 days with a range of 85 to 1,261 days. PAC offenders who recidivated had an average follow-up time of 1,237 days with a range of 931 to 2,103 days. PAC offenders who did not recidivate had an average follow-up time of 1,083 days, with a range of 909 to 1,266 days.

Overall, 33% of all male offenders and 27% of all female offenders recidivated (see Table 30). A Chi Square test of independence revealed that the difference in proportions of recidivists and non-recidivists was significant by gender, χ^2 (1, N = 3,274) = 9.508, $p = .002$, with males being more likely to recidivate and females being more likely not to recidivate. Table 31 shows that 40.8% of Status offenders, 36.5% of Métis offenders, 27% of Non-Status offenders, 22.4% of Non-Aboriginal offenders, and 9.9% of Unknown offenders recidivated. A Chi Square test of independence revealed that the difference in proportions between recidivists' and non-recidivists' ethnicity was significant by ethnicity, χ^2 (4, N = 3,276) = 162.316, $p < .001$, with Non-Aboriginal and Non-Status offenders being less likely to recidivate, and Status and Métis offenders being more likely to recidivate.

Table 32 shows the frequencies of recidivists and non-recidivists across the current and proposed SPRA risk levels. Using the current risk levels, 10.6% of the low risk level, 26.8% of the medium risk level, and 50.2% of the high risk level offenders recidivated. A Chi Square test of independence revealed that the proportions of recidivists and non-recidivists who fell in the current SPRA risk levels was significant, χ^2 (2, N = 3,276) = 282.081, $p < .001$, with non-recidivists more likely to fall in the low and medium risk categories and the recidivists being more likely to fall in the high risk category. Using the proposed risk levels, the frequencies of

recidivists in the low and medium risk levels did not change; however, 48.6% of the high risk level and 64.2% of the very high risk level recidivated. A Chi Square test of independence revealed that the difference in proportions of recidivists and non-recidivists who fell in the proposed SPRA risk levels was significant, χ^2 (3, N = 3,276) = 292.739, $p < .001$, with non-recidivists more likely to fall in the low and medium risk categories and the recidivists being more likely to fall in the high and very high risk categories.

Table 33 shows the distribution of recidivists for CC and PAC offenders analyzed by the current and proposed SPRA risk levels. Table 33 shows that when using the current SPRA risk levels, 47% of CC offenders and 65.8% of PAC offenders who recidivated were in the high risk level. Table 33 also shows that when considering the proposed SPRA risk levels, 41.5% of CC offenders who recidivated were in the high risk level and 5.5% were in the very high risk level, while 51.7% of PAC offenders who recidivated were in the high risk level, and 14.1% were in the very high risk level. The range and average time to recidivate for recidivists was also investigated with the current and proposed SPRA risk levels. Table 34shows the frequency of recidivists and the range and average time to recidivate for offenders who recidivated by their risk level using the current SPRA risk levels. Fifty-three offenders in low risk level, 473 offenders in the medium risk level, and 510 offenders in the high risk level recidivated. As shown in the table, the medium risk level shows the highest average time to recidivate with approximately 532 days, followed by the high risk level with approximately 490 days, and then lastly the low risk level with approximately 478 days. Table 34 also shows the frequency of recidivists and the range and average time to recidivate for recidivists by the proposed SPRA risk levels. The average time to recidivate for the low and medium risk levels shown in Table 38 for the proposed risk levels remained the same. The average time to recidivate for offenders in the high risk level was 493 days, and the average time to recidivate for offenders in the very high risk level was 470 days.

Recidivism Sentence Types

There were six categories of sentence types: Custody, PR Community Service, Conditional Sentence, Intermittent, PR Reporting, and PR Restitution. As seen in Table 35, the most frequent recidivism sentence type was Custody sentence (38.9%), followed by PR Reporting (30.8%), then Conditional Sentence (24.2%), PR Community Service (2.7%), PR Restitution (2.2%), and finally Intermittent (1.2%). Table 36 shows the categorization of the recidivism sentence types for males and females. A Chi Square test of independence revealed that the difference in proportions of types of recidivism sentences for males and females was significant, χ^2 (6, N = 3,274) = 24.817, $p < .001$, with males receiving more custody and conditional sentences and females receiving more PR community service and PR reporting.

Relationship between SPRA Score and the Current and Proposed Risk Levels

For all offenders, Table 37 shows that the current SPRA risk levels and total score are highly and significantly correlated ($r = 0.896$, $p < 0.01$). As seen in Table 38, the proposed SPRA risk levels are also highly and significantly correlated with the SPRA total score ($r = 0.918$, $p < 0.01$).

PAC Offenders with Current and Proposed Risk Levels. Table 39 shows the correlations of PAC offenders with the current SPRA risk levels. Table 39 shows significant correlations between the SPRA total score and current SPRA risk levels ($r = 0.872$, $p < 0.01$). In Table 40, a stronger correlation was found between the proposed SPRA risk levels and SPRA total score ($r = .918$, $p < .01$).

CC Offenders with Current and Proposed Risk Levels. Table 41 shows the correlations of CC offenders with the current SPRA risk levels. The current SPRA risk level correlated strongly with the SPRA total score ($r = 0.895$, $p < 0.01$). Table 42 shows a significant correlation between the proposed SPRA risk levels and SPRA total score for CC offenders ($r = 0.916$, $p < 0.01$).

Predictive Validity of SPRA: T-test, Correlations with Recidivism, ROC, and Survival Analyses

T-test. Table 43 shows the results of the *t*-test of the differences between the current and proposed SPRA risk levels, specifically between the high and very high risk levels. As shown, there is a significant difference between the high and very high risk levels ($t = -3.047$, $p < 0.01$), justifying the division of the original high risk group into high and very high risk groups.

Correlations. The current SPRA risk levels are significantly correlated with the dichotomous recidivism variable ($r = 0.291$, $p < 0.01$). A slightly stronger correlation was found between the SPRA total score and the dichotomous recidivism variable ($r = 0.319$, $p < 0.01$). The proposed SPRA risk levels also significantly correlated with the dichotomous recidivism variable ($r = 0.297$, $p < 0.01$). For PAC offenders, significant correlations were found between the dichotomous recidivism variable and the SPRA total score ($r = 0.279$, $p < 0.01$) and between the dichotomous recidivism variable and the current SPRA risk levels ($r = 0.223$, $p < 0.01$). The correlation between the dichotomous recidivism variable and the proposed SPRA risk levels was slightly stronger ($r = 0.231$, $p < 0.01$). For CC offenders, significant correlations were found between the dichotomous recidivism variable and the SPRA total score ($r = 0.302$, $p < 0.01$) and between the dichotomous recidivism variable and the current SPRA risk levels ($r = 0.278$, $p < 0.01$). Again, the correlation between the dichotomous recidivism variable and the proposed SPRA risk levels was slightly stronger ($r = 0.283$, $p < 0.01$). Table 44 shows that all of the individual SPRA items have significant, albeit weak, correlations with the dichotomous recidivism variable.

Cross-tabulating the Current and Proposed SPRA Risk Levels. Table 45 shows the total SPRA scores cross-tabulated with the current SPRA risk levels, while Table 46 shows the total SPRA scores cross-tabulated with the proposed SPRA risk levels. Between the current and proposed SPRA risk levels, the distribution of offenders in the low and medium levels did not change. With the proposed SPRA risk levels, the high level now contains scores from 12 to 16, and the very high level contains scores from 17 to 22.

Average Scores. The mean SPRA score for recidivists was 11.35 while for non-recidivists it was 8.78 (see Table 47). A *t*-test was conducted and it was found that the SPRA

total scores was significantly different between recidivists and non-recidivists (t (3,274) = -19.226, $p < 0.001$).

ROC Curves. Figure 1 shows the ROC curve predicting recidivism for all offenders. The area under the curve (AUC) is AUC = 0.695, which means that the probability of a recidivist scoring higher than a non-recidivist is 69.5%. Figure 2 and Figure 3 show the ROC curves for the PAC (AUC = 0.658) and CC offenders (AUC = 0.688), respectively. Figure 4 and Figure 5 show the ROC curves and the AUC values for male (AUC = 0.698) and female offenders (AUC = 0.678), respectively. Figure 6 shows the ROC curve predicting recidivism for offenders with the current SPRA risk levels. The AUC is 0.664, which means that the probability of a recidivist scoring higher than a non-recidivist is 66.4%. Figure 7 shows the ROC curve predicting recidivism for offenders with the proposed SPRA risk levels (AUC = 0.667), which means that the probability of a recidivists scoring higher than a non-recidivist is 66.7%. As such, the proposed SPRA risk levels slightly add to the predictive validity of the SPRA.

Survival Analyses. Figure 8 shows the survival curve for all offenders for general recidivism, with 1,036 recidivists and 2,240 non-recidivists in the sample. Survival analyses were completed on different sample categorizations, specifically sex (Figure 9), age groups (Figure 10), ethnicity (Figure 11), education (Figure 12), current SPRA risk levels (Figure 13), and proposed SPRA risk levels (Figure 14). According to the survival analyses for sex, 73% of female offenders and 67% of male offenders did not recidivate. According to the survival analyses for ethnicity, approximately 59% of Status offenders, 78% of Non-Aboriginal offenders, 64% of Métis offenders, 90% of Unknown offenders, and 73% of Non-Status offenders did not recidivate. Across the current SPRA risk levels, 89% of the low risk level, 73% of the medium risk level, and 50% of the high risk level did not recidivate. Across the proposed SPRA risk levels, recidivism rates for the low and medium risk levels remained constant, while 51% of the proposed high risk level and 36% of the proposed very high risk level did not recidivate. These recidivism rates across the proposed SPRA risk levels indicate that the very high risk level captures a more specific group of offenders that recidivate faster and with higher frequency than all other risk levels.

Item Analyses

While the internal reliability coefficient for the SPRA is $\alpha = 0.627$, Table 48 shows that the highest internal consistency coefficient possible to attain through deleting any of the 15 items is $\alpha = 0.641$. According to Table 49 however, factor analyses showed that the 15 items load onto six factors. Factor 1 comprises employment stability, unemployed at the time of the sentence, and academic and vocational stability, conceptualized as “work and school”. Factor 2 comprises prior criminal code convictions and age, conceptualized as “criminal history”. Factor 3 comprises self-management, attitude, and family/marital relationships, conceptualized as “criminal attitude lacking insight”. Factor 4 comprises drug and alcohol abuse, peers and companions, age, and residence stability, conceptualized as “youthful delinquency”. Factor 5 comprises residence stability, financial situation, and antisocial behaviour, conceptualized as “lack of stability”. Finally, Factor 6 comprises age, gender and family/marital relationships, conceptualized as “males with family support”. It can be seen that “family/marital relationships”

loads onto both Factor 3 and Factor 6, “age” loads onto Factor 2, Factor 4, and Factor 6, and “residence stability” loads onto Factor 4 and Factor 5.

Table 48 shows that removing “residence stability” and “family/marital relationships” decreases the internal consistency reliability and as such there is nothing to be gained from doing so. Removing the age and gender items would increase the internal consistency reliability, but since it would gain only a minimal increase and because the items are integral to the offender’s case and assessment, it is not suggested they are removed. Table 50 shows the frequencies and percentages of offenders who scored 0 (no) and 1 (yes) or 0 (no), 1 (partly) and 2 (yes) on each of the SPRA items.

DISCUSSION

The present study was commissioned to investigate three aspects of the SPRA: the psychometric properties and predictive validity of the SPRA, the possible addition of a fourth risk level, and the relationship between criminogenic needs (Andrews, Bonta, & Hoge, 1990) and the likelihood of reoffending as measured by the SPRA.

Psychometric Properties of the SPRA

Reliability. Cronbach's alpha determines how closely related a set of items are as a group. The commonly used acceptable level of agreement is $\alpha = 0.70$ or higher (Cronbach, 1951). The reliability of the SPRA was found to be $\alpha = 0.627$. This value suggests that the reliability of the SPRA is below what is considered an acceptable level and is lower than comparable instruments. For example, The Level of Service Inventory – Revised (LSI-R: Andrews & Bonta, 1995) and the Level of Service/Case Management Inventory (LS/CMI; Andrews, Bonta & Wormith, 2004) generated mean alpha coefficients of .84 and .89, respectively, across multiple (13 and 9) studies (Andrews, Bonta & Wormith, 2010).

As can be seen in Table 63, the removal of items from the instrument does not increase the reliability above the acceptable level. Therefore the low alpha is not due to any particular item. A Cronbach's alpha of $\alpha = 0.70$ or higher usually means that the instrument is measuring an underlying or latent construct and is doing so reliably. This suggests that the items on the SPRA may not be measuring or capturing the underlying construct (propensity to recidivate) well. It is possible that the items are too broad and are therefore not capturing the different aspects of any of the criminogenic needs. The relatively small number of items may also contribute to the low reliability coefficient. As only one assessment was conducted on each offender, inter-rater agreement between assessors could not be calculated.

Predictive Validity. The predictive validity is a measure of how well the SPRA predicts recidivism. The predictive validity of the current SPRA was good, but with the addition of the fourth, very high risk level, it increased. For all offenders, Table 52 shows a significant correlation between the dichotomous recidivism variable and the current SPRA risk levels ($r = 0.291$, $p < 0.01$), whereas Table 55 shows a slightly stronger correlation between the dichotomous recidivism variable and the proposed SPRA risk levels ($r = 0.297$, $p < 0.01$). For PAC offenders, Table 53 shows a significant correlation between the dichotomous recidivism variable and the current SPRA risk levels ($r = 0.223$, $p < 0.01$), while Table 56 shows a slightly stronger correlation between the dichotomous recidivism variable and the proposed SPRA risk levels ($r = 0.231$, $p < 0.01$). For the CC offenders, Table 54 shows a significant correlation between the dichotomous recidivism variable and the current SPRA risk levels ($r = 0.278$, $p < 0.01$), while Table 57 shows a slightly stronger correlation between the dichotomous recidivism variable and the proposed SPRA risk levels ($r = 0.283$, $p < 0.01$). In addition, the correlation between the individual SPRA items and recidivism showed that while all had a significant relationship with recidivism, all had a weak relationship. This means that the individual items do not seem to be predicting recidivism as well as would be preferred.

The Addition of a Fourth Risk Level

The predictive validity analyses provided support for the addition of a fourth risk level, specifically, the very high risk level. A very high risk level was selected for examination instead of a very low risk level to maximize the cost efficiency of distributing resources to offenders who are at the greatest risk to reoffend, in accordance with the theory of Risk, Need, and Responsivity (RNR; Andrews, Bonta, & Hoge, 1990). According to the RNR theory, risk levels are used in institutional and community correctional settings to allocate resources. That is, more intensive resources and conditions are allocated to those offenders who need it most, specifically higher risk offenders, to fulfill cost-efficient conventions. The high and very high risk levels have been shown to be significantly different based on the *t*-test comparing the two levels (Table 51), the recidivism rates for the two levels, and the ROC curves (Figures 6 and 7) which show that there is a slight increase in the prediction of recidivists' scores versus non-recidivists' scores, although not a large difference as the confidence intervals of the two AUC values overlap. Survival graphs comparing the current and proposed SPRA risk levels clearly demonstrate that the offenders in the very high risk level are distinct from the other three groups of offenders, specifically in terms of how frequently and how fast they recidivate. The addition of this fourth risk level is therefore not only supported by the statistical analyses and the theory on offender treatment, but also supports the functional reality of the allocation of finite resources. It should be noted, however, that the very high risk group constituted a very small percentage of the complete sample (3.3 %).

The Relationship between Criminogenic Needs and Recidivism

The criminogenic needs as identified by Andrews et al. (1990) are criminal history, education/employment, family/marital, leisure/recreation, companions, procriminal attitude/orientation, substance abuse, and antisocial pattern. Of the 15 items in the SPRA, seven of the eight criminogenic needs are represented, the exceptions being leisure/recreation. While seven of the eight criminogenic needs are represented by the items on the SPRA, it is important to note that they do not match as cleanly to the eight needs as is considered acceptable (Andrews et al., 1990). The items on the SPRA (Appendix A) seem to have face validity with the empirically identified domains of criminogenic needs. However, both the Cronbach's Alpha of $\alpha = 0.627$ and the predictive validity coefficients ($r = .319$ and ROC = .695) are comparable to those often found with comparable instruments, but are not exceptional. ROC curve predictions for risk assessment measures are generally considered acceptable with a minimum of an AUC of 0.70. There are a few possible reasons for these modest findings, including the number and comprehensiveness of the prediction items to the quality of administration of the instrument by trained staff. Therefore, it is suggested that the Ministry of Corrections and Policing, Ministry of Justice consider the possibility of further revision to the instrument, possibly including items that capture untapped criminogenic needs and other sources of offender recidivism.

Limitations

An examination of individual offenders' raw data revealed a number of irregularities in the data file prepared by the Ministry of Corrections and Policing, Ministry of Justice. First, there was one PAC offender whose custodial sentence length (i.e., the time between the custodial

sentence start date and the community sentence start date) totalled 982 days, longer than the allowed two-years-less-a-day regulation for provincial offenders. While the dates provided are technically correct, this offender went unlawfully at large (UAL) one month after beginning a custody order and was at large for approximately two years. The offender was subsequently apprehended and returned to custody serving 310 days in custody before his release to serve his probation order, which allowed the offender to be selected for the current sample. Hence, although the calculated dates for time in custody were reported to be 938, the offender was sentenced to 310 days in custody. Second, there were five offenders whose SPRAs were completed under the reason of "bail", although these offenders were part of the Domestic Violence Treatment Option and therefore were not necessarily on bail when these assessments were completed. The code of "bail" was entered as it was the most accurate term for their situations, if not completely accurate.

Third, there were 10 offenders whose SPRAs were completed under the reason of "jail," although the majority were cases where the offender started on probation/conditional sentence but ended up in custody prior to the SPRA's completion. Therefore, offenders were classified in the PAC group although the offenders were from the CC group to begin with where their SPRAs were completed. However, it is reasonable to believe that these few cases of unusual coding have not had any impact on the overall findings, in part because of the large sample size and in part because the unusual coding occurred on non-critical, descriptive variables and not on essential SPRA and outcome (i.e., recidivism) variables. There were two further limitations related to the collection of recidivism information, such that any offenses committed outside of Saskatchewan were not recorded, and it was unknown if any offender had died during the follow up period. Lastly, this sample of offenders was largely comprised of community offenders, thereby restricting the generalizability to offender samples with more custodial sentences due to the differences in risk level and recidivism rates between the two groups.

Conclusion

The overall predictive validity of the SPRA was adequate compared to other established risk/need instruments. The addition of a fourth, very high risk level is both theoretically and empirically supported, and should also increase the cost effectiveness of resource allocation for the Ministry. However, the internal consistency of the SPRA is relatively poor and lower than that of other instruments (e.g., versions of the Level of Service Inventory [LSI]). This in itself is not inherently bad as it may reflect the fact that the SPRA taps into a wide array of risk items that are quite independent of one another.

We recommend that future research explores the inclusion of more items that are explicitly related to the empirically based criminogenic needs as discussed by Andrews et al. (1990). Ideally, the SPRA items should reflect a full range of criminogenic needs and predict recidivism as accurately as possible with a sufficient number of items on the various domains reflecting the Central Eight criminogenic needs such that subscales representing the Central Eight may be used for correctional planning and case management. We also recommend that the findings of this review be used to augment current training of staff on the SPRA. In particular, the predictive validity findings, as reflected in Table 36 and Figures 13 and 14, would be helpful for trainees who will be using the SPRA in their daily work.

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Appendix A: The SPRA Scoring Sheet

1. Age	40 or over = 0 39 or less =1
2. Gender	Male = 1 Female = 0
3. Number of Prior Criminal Code Convictions	No Priors = 0 1 Convictions = 1 2 or More = 2
4. Convictions for	Not Applicable = 0 Fraud, Forgery, Worthless Cheques=1 Theft , Break and Enter, Robbery = 2 Convictions for both 1 and 2 = 3
5. Residence Stability	None = 0 One =1 Two or More = 2
6. Academic and Vocational Skills	Completed Grade 10 or marketable skill =0 Has Less Than Grade 10 and no marketable skill = 1
7. Unemployed at time of offence	Employed at time of offence = 0 Unemployed at time of offence = 1
8. Employment Stability	Employed 50% or more over last 12 months = 0 Unemployed 50% or more over last 12 months = 1
9. Financial Situation	No Serious Problems = 0 Evidence of Serious Problems =1
10. Family/Marital Relationships	Pro-social support = 0 Antisocial support/lack of pro-social support =1
11. Peers and Companions	No Known Problems With Peers = 0 Some Problems With Some Peers = 1 Associates Mainly With Negative Peers = 2
12. Drug and Alcohol Use	No Evidence of impact = 0 Evidence of impact in one area = 1 Evidence of impact in two or more areas = 2

If 1 or 2 Specify Primary Type of Abuse: _____

13. Antisocial Behavior	No evidence of a pattern of antisocial behaviour = 0 Evidence of a pattern of antisocial behaviour = 1
14. Attitude	Attitudes Pro-social and supportive of justice system = 0 Either some pro-criminal attitudes or not supportive of justice system = 1 Pro-criminal attitude and not supportive of justice system = 2
15. Self-Management	Good insight and strategies = 0 Lack of insight and strategies = 1

Risk Levels and Cut Off Ratings: Low (5 and Lower) Medium (6-11) High (12 and Higher)

Total Risk Rating ____

Risk Level _____

Appendix B: Tables

Table 1. Frequencies of all offenders categorized by sex.

	Frequency	Percent	Cumulative Percent
Female	752	22.9%	22.9%
Male	2,522	77.0%	99.9%
Missing	2	0.1%	100%
Total	3,276		

Table 2. Frequencies of all offenders categorized by age group.

	Frequency	Percent	Cumulative Percent
20 – 39	2,308	70.5%	70.5%
40 – 59	879	26.8%	97.3%
60 – 79	84	2.5%	99.8%
80 – 99	5	0.2%	100%
Total	3,276		

Table 3. Frequencies of male offenders categorized by age group.

	Frequency	Percent	Cumulative Percent
20 – 39	1,763	69.9%	69.9%
40 – 59	682	27.0%	96.9%
60 – 79	72	2.9%	99.8%
80 – 99	5	0.2%	100%
Total	2,522		

Table 4. Frequencies of female offenders categorized by age group.

	Frequency	Percent	Cumulative Percent
20 – 39	544	72.3%	72.3%
40 – 59	196	26.1%	98.4%
60 – 79	12	1.6%	100%
Total	752		

Table 5. Frequencies of all offenders categorized by ethnicity.

	Frequency	Percent	Cumulative Percent
Métis	329	10.0%	10.0%
Non-Aboriginal	986	30.1%	40.1%
Non-Status	148	4.5%	44.6%
Status	1,541	47.1%	91.7%
Unknown	272	8.3%	100%
Total	3,276		

Table 6. Frequencies of male offenders categorized by ethnicity.

	Frequency	Percent	Cumulative Percent
Métis	248	9.8%	9.8%
Non-Aboriginal	861	34.1%	44.0%
Non-status	122	4.8%	48.8%
Status	1,107	43.9%	92.7%
Unknown	184	7.3%	100%
Total	2,522		

Table 7. Frequencies of female offenders categorized by ethnicity.

	Frequency	Percent	Cumulative Percent
Métis	80	10.6%	10.6%
Non-Aboriginal	125	16.6%	27.2%
Non-status	26	3.5%	30.7%
Status	433	57.6%	88.3%
Unknown	88	11.7%	100%
Total	752		

Table 8. Frequencies of PAC offenders categorized by ethnicity.

	Frequency	Percent	Cumulative Percent
Métis	24	11.8%	11.8%
Non-Aboriginal	46	22.8%	34.6%
Non-status	14	6.9%	41.5%
Status	117	57.9%	99.4%
Unknown	1	0.6%	100%
Total	202		

Table 9. Frequencies of CC offenders categorized by ethnicity.

	Frequency	Percent	Cumulative Percent
Métis	305	9.9%	9.9%
Non-Aboriginal	940	30.6%	40.5%
Non-status	134	4.4%	44.9%
Status	1,424	46.3%	91.2%
Unknown	271	8.8%	100%
Total	3,074		

Table 10. Frequencies of all offenders categorized by the highest level of education achieved.

	Frequency	Percent	Cumulative Percent
Grade 2	8	0.2%	0.2%
Grade 3	2	0.1%	0.3%
Grade 4	7	0.2%	0.5%
Grade 5	26	0.8%	1.3%
Grade 6	47	1.4%	2.7%
Grade 7	58	1.8%	4.5%
Grade 8	164	5.0%	9.5%
Grade 9	462	14.1%	23.6%
Grade 10	714	21.8%	45.4%
Grade 11	410	12.5%	57.9%
Grade 12	891	27.2%	85.1%
Business School	29	0.9%	86.0%
Technical School	118	3.6%	89.6%
Unknown	219	6.7%	96.3%
University Degree	24	0.7%	97.0%
University (some)	93	2.8%	99.8%
Missing	4	0.2%	100%
Total	3,276		

Table 11. Frequencies of male offenders categorized by the highest level of education achieved.

	Frequency	Percent	Cumulative Percent
Grade 2	8	0.3%	0.3%
Grade 3	2	0.1%	0.4%
Grade 4	7	0.3%	0.7%
Grade 5	18	0.7%	1.4%
Grade 6	39	1.5%	2.9%
Grade 7	48	1.9%	4.8%
Grade 8	131	5.2%	10.0%
Grade 9	351	13.9%	23.9%
Grade 10	549	21.8%	45.7%
Grade 11	329	13.0%	58.7%
Grade 12	689	27.3%	86.0%
Business School	15	0.6%	86.6%
Technical School	99	3.9%	90.5%
Unknown	153	6.1%	96.6%
University Degree	19	0.8%	97.4%
University (some)	62	2.5%	99.9%
Missing	3	0.1%	100%
Total	2,522		

Table 12. Frequencies of female offenders categorized by the highest level of education achieved.

	Frequency	Percent	Cumulative Percent
Grade 5	8	1.1%	1.1%
Grade 6	8	1.1%	2.2%
Grade 7	10	1.3%	3.5%
Grade 8	33	4.4%	7.9%
Grade 9	111	14.8%	22.7%
Grade 10	165	21.9%	44.6%
Grade 11	81	10.8%	55.4%
Grade 12	200	26.6%	82.0%
Business School	14	1.9%	83.9%
Technical School	19	2.5%	86.4%
Unknown	66	8.8%	95.2%
University Degree	5	0.6%	95.8%
University (some)	31	4.1%	99.9%
Missing	1	0.1%	100%
Total	752		

Table 13. Frequencies of all offenders categorized by PAC or CC designation.

	Frequency	Percent	Cumulative Percent
PAC	202	6.2%	6.2%
CC	3,074	93.8%	100%
Total	3,276		

Table 14. Frequencies of male offenders categorized by PAC or CC designation.

	Frequency	Percent	Cumulative Percent
PAC	187	7.4%	7.4%
CC	2,335	92.6%	100%
Total	2,522		

Table 15. Frequencies of female offenders categorized by PAC or CC designation.

	Frequency	Percent	Cumulative Percent
PAC	15	2.0%	2.0%
CC	737	98.0%	100%
Total	752		

Table 16. Frequencies of age groups categorized by PAC or CC designation.

	20 – 39	40 – 59	60 – 79	80 – 99
PAC	143	56	3	0
CC	2,165	823	81	5
Total	2,308	879	84	5

Table 17. Frequencies of current and proposed SPRA risk levels of PAC and CC offenders.

	PAC Offenders	CC Offenders
Current Risk Levels		
Low	9 (4.5%)	489 (15.9%)
Medium	76 (37.6%)	1,686 (54.8%)
High	117 (57.9%)	899 (29.3%)
Total	202	3,074
Proposed Risk Levels		
Low	9 (4.5%)	489 (15.9%)
Medium	76 (37.6%)	1,686 (54.8%)
High	95 (47.0%)	816 (26.5%)
Very High	22 (10.9%)	84 (2.8%)
Total	202	3,074

Table 18. Frequencies of all PAC offenders categorized by custodial sentence length.

	Frequency	Percent	Cumulative Percent
One month	27	13.4%	13.4%
Two months	35	17.4%	30.8%
Three months	23	11.4%	42.2%
Four months	23	11.4%	53.6%
Five months	17	8.4%	62.0%
Six months	9	4.4%	66.4%
Six months – one year	49	24.2%	90.6%
One – two years	18	8.9%	99.5%
Two – three years	1	0.5%	100%
Total	202		

Table 19. Frequencies of male PAC offenders categorized by custodial sentence length.

	Frequency	Percent	Cumulative Percent
One month	22	11.8%	11.8%
Two months	31	16.6%	28.4%
Three months	22	11.8%	40.2%
Four months	21	11.2%	51.4%
Five months	16	8.6%	60.0%
Six months	9	4.8%	64.8%
Six months – one year	49	26.2%	91.0%
One – two years	16	8.6%	99.6%
Two – three years	1	0.4%	100%
Total	187		

Table 20. Frequencies of female PAC offenders categorized by custodial sentence length.

	Frequency	Percent	Cumulative Percent
One month	5	33.3%	33.3%
Two months	4	26.7%	60.0%
Three months	1	6.7%	66.7%
Four months	2	13.3%	80.0%
Five months	1	6.7%	86.7%
One – two years	2	13.3%	100%
Total	15		

Table 21. Frequencies of CC sentence types for all offenders.

	Frequency	Percent	Cumulative Percent
PR Reporting	2,240	68.4%	68.4%
Conditional Sentence	898	27.4%	95.85
PR Community Service	74	2.2%	98.0%
PR Restitution	64	2.0%	100%
Total	3,276		

Table 22. Frequencies of CC sentence types for male and female offenders.

	Males	Females
PR Reporting	1,713 (67.9%)	526 (69.9%)
Conditional Sentence	726 (28.7%)	171 (22.7%)
PR Community Service	38 (1.5%)	36 (4.7%)
PR Restitution	45 (1.9%)	19 (2.7%)
Total	2,522	752

Table 23. Frequencies of current SPRA risk levels for all offenders.

	Frequency	Percent	Cumulative Percent
Low	498	15.2%	15.2%
Medium	1,762	53.8%	69.0%
High	1,016	31.0%	100%
Total	3,276		

Table 24. Frequencies of proposed SPRA risk levels for all offenders.

	Frequency	Percent	Cumulative Percent
Low	498	15.2%	15.2%
Medium	1,762	53.8%	69.0%
High	910	27.7%	96.7%
Very High	106	3.3%	100%
Total	3,276		

Table 25. Frequencies of current and proposed SPRA risk levels for male and female offenders.

	Males	Females
Current Risk Levels		
Low	345 (13.7%)	153 (20.3%)
Medium	1,359 (53.8%)	402 (53.4%)
High	818 (32.5%)	197 (26.3%)
Total	2,522	752
Proposed Risk Levels		
Low	345 (13.7%)	153 (20.3%)
Medium	1,359 (53.8%)	402 (53.4%)
High	732 (29.0%)	177 (23.5%)
Very High	86 (3.5%)	20 (2.8%)
Total	2,522	752

Table 26. Frequencies of current and proposed SPRA risk levels for all offenders by ethnicity.

	Métis	Non-Aboriginal	Non-Status	Status	Unknown
Current Risk Levels					
Low	33 (10.0%)	243 (24.6%)	18 (12.1%)	114 (7.3%)	90 (33.1%)
Medium	181 (55.0%)	537 (54.4%)	73 (49.3%)	815 (52.8%)	156 (57.4%)
High	115 (35.0%)	206 (21.0%)	57 (38.6%)	612 (39.9%)	26 (9.5%)
Total	329	986	148	1,541	272
Proposed Risk Levels					
Low	33 (10.0%)	243 (24.6%)	18 (12.1%)	114 (7.3%)	90 (33.1%)
Medium	181 (55.0%)	537 (54.4%)	73 (49.3%)	815 (52.8%)	156 (57.4%)
High	106 (32.2%)	192 (19.5%)	53 (35.8%)	534 (34.6%)	25 (9.2%)
Very High	9 (2.8%)	14 (1.5%)	4 (2.8%)	78 (5.3%)	1 (0.3%)
Total	329	986	148	1,541	272

Table 27. Frequency, range, and average follow-up time of recidivists vs. non-recidivists.

	Frequency	Percent	Average follow-up time	Range of follow-up time
Recidivists	1,036	31.6%	1,173.06	903 – 2,103
Non-recidivists	2,240	68.4%	2,084.72	85 – 1,266
Total	3,276			

Note. Follow-up time is measured in days.

Table 28. Frequencies of recidivists and non-recidivists categorized by PAC or CC designation.

	PAC	CC
Recidivists	120 (59.4%)	916 (29.8%)
Non-recidivists	82 (40.6%)	2,158 (70.2%)
Total	202	3,074

Table 29. Follow-up time average and range for all offenders.

	Number of Offenders	Mean (SD)	Minimum	Maximum	Range
Recidivists					
CC	916	1,108.54 (103.35)	903	1,266	363
PAC	120	1,237.58 (173.54)	931	2,103	1,172
Non-Recidivists					
CC	2,158	1,001.49 (140.263)	85	1,261	1,176
PAC	82	1,083.23 (104.064)	909	1,266	357

Note. Mean, minimum, maximum, and range values all measured in days.

Table 30. Frequencies of recidivists and non-recidivists by sex.

	Males	Females
Recidivists	831 (32.9%)	203 (26.9%)
Non-Recidivists	1,691 (67.1%)	549 (73.1%)
Total	2,522	752

Table 31. Frequencies of recidivists and non-recidivists by ethnicity.

	Métis	Non-Aboriginal	Non-Status	Status	Unknown
Recidivists	120 (36.5%)	221 (22.4%)	40 (27.1%)	628 (40.8%)	27 (9.9%)
Non-Recidivists	209 (63.5%)	765 (77.6%)	108 (72.9%)	913 (59.2%)	245 (90.1%)
Total	329	986	148	1,541	272

Table 32. Frequencies of recidivists and non-recidivists by the current and proposed SPRA risk levels.

	Recidivists	Non-Recidivists	Total
Current Risk Levels			
Low	53 (10.6%)	445 (89.4%)	498
Medium	473 (26.8%)	1,289 (73.2%)	1,762
High	510 (50.2%)	506 (49.8%)	1,016
Proposed Risk Levels			
Low	53 (10.6%)	445 (89.4%)	498
Medium	473 (26.8%)	1,289 (73.2%)	1,761
High	442 (48.6%)	468 (51.4%)	910
Very High	68 (64.2%)	38 (35.8%)	106

Table 33. Distribution of recidivists for CC and PAC offenders by current and proposed SPRA risk levels.

	CC	PAC
Current Risk Levels		
Low	51 (5.6%)	2 (1.7%)
Medium	434 (47.4%)	39 (32.5%)
High	431 (47.0%)	79 (65.8%)
Total	916	120
Proposed Risk Levels		
Low	51 (5.6%)	2 (1.7%)
Medium	434 (47.4%)	39 (32.5%)
High	380 (41.5%)	62 (51.7%)
Very High	51 (5.5%)	17 (14.1%)
Total	916	120

Table 34. Average and range of time to recidivate for recidivists by the current and proposed SPRA risk levels.

	Frequency of Recidivists	Mean (SD)	Range	Minimum	Maximum
Current Risk Levels					
Low	53	477.58 (228.180)	1,025	39	1,064
Medium	473	531.45 (263.290)	1,118	11	1,199
High	510	489.78 (255.744)	1,172	20	1,192
Proposed Risk Levels					
Low	53	477.58 (228.180)	1,025	39	1,064
Medium	473	531.45 (263.290)	1,118	11	1,199
High	442	492.76 (251.783)	1,172	20	1,192
Very High	68	470.43 (281.381)	1,048	94	1,142

Note. Mean, range, minimum, and maximum values are measured in days.

Table 35. Frequencies of all recidivists categorized by recidivism sentence type.

	Frequency	Percent	Cumulative Percent
Custody	405	38.9%	38.9%
Community Service	28	2.7%	41.6%
Conditional Sentence	251	24.2%	65.8%
Intermittent	12	1.2%	67.0%
Probation	318	30.8%	97.8%
Restitution	22	2.2%	100.0%
Total	1,036		

Table 36. Frequencies of recidivism sentence types for all recidivists by sex. 203

	Males	Females
Custody	342 (41.2%)	62 (30.5%)
Community Service	16 (1.9%)	11 (5.4%)
Conditional Sentence	203 (24.4%)	48 (23.7%)
Intermittent	10 (1.2%)	2 (0.9%)
Probation	241 (29.0%)	77 (37.9%)
Restitution	19 (2.3%)	3 (1.6%)
Total	831	203

Table 37. Correlations for all offenders with the current SPRA risk levels.

	Current SPRA Risk Levels	Recidivism Yes/No
SPRA Total Score	.896**	.319**
Current SPRA Risk Levels		.291**

*Note. ** = $p < .01$, two-tailed.*

Table 38. Correlations for all offenders with the proposed SPRA risk levels.

	Proposed SPRA Risk Levels	Recidivism Yes/No
SPRA Total Score	.918**	.319**
Proposed SPRA Risk Levels		.297**

*Note. ** = $p < .01$, two-tailed.*

Table 39. Correlations for PAC offenders with the current SPRA risk levels.

	Current SPRA Risk Levels	Recidivism Yes/No
SPRA Total Score	.872**	.279**
Current SPRA Risk Levels		.223**

*Note. ** = p < .01, two-tailed.*

Table 40. Correlations for PAC offenders with the proposed SPRA risk levels.

	Proposed SPRA Risk Levels	Recidivism Yes/No
SPRA Total Score	.918**	.279**
Proposed SPRA Risk Levels		.231**

*Note. ** = p < .01, two-tailed.*

Table 41. Correlations for CC offenders with the current SPRA risk levels.

	Current SPRA Risk Levels	Recidivism Yes/No
SPRA Total Score	.895**	.302**
Current SPRA Risk Levels		.278**

*Note. * = p < .05 (2-tailed) ** = p < .01 (2-tailed).*

Table 42. Correlations for CC offenders with the proposed SPRA risk levels.

	Proposed SPRA Risk Levels	Recidivism Yes/No
SPRA Total Score	.916**	.302**
Proposed SPRA Risk Levels		.283**

*Note. * = p < .05 (2-tailed) ** = p < .01 (2-tailed).*

Table 43. T-test of the difference in recidivism between the high and very high levels of the proposed SPRA risk levels.

		t	df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
					Lower	Upper
Recidivism	Equal variances assumed	-3.047	1,014	.002	-.256	-.055
	Equal variances not assumed	-3.138	132.76	.002	-.254	-.058

Note. Levene's test indicated that equal variances are to be assumed.

Table 44. Correlations between the individual SPRA items and recidivism.

Item Number	Correlation
1. Age	0.121**
2. Gender	0.056**
3. Number of Prior Criminal Code Convictions	0.202**
4. Convictions for	0.170**
5. Residence Stability	0.093**
6. Academic and Vocational Skills	0.125**
7. Unemployed at Time of Offence	0.164**
8. Employment Stability	0.205**
9. Financial Situation	0.067**
10. Family/Marital	0.057**
11. Peers and Companions	0.226**
12. Drug and Alcohol Abuse	0.183**
13. Antisocial Behaviour	0.068**
14. Attitude	0.091**
15. Self-Management	0.043*

*Note. * = $p < .05$ (2-tailed), ** = $p < .01$ (2-tailed).*

Table 45. Distributions for all offenders using SPRA total scores and the current SPRA risk levels.

	Low	Medium	High
0	1 (0.2)		
1	11 (2.2)		
2	58 (11.6)		
3	93 (18.7)		
4	136 (27.3)		
5	199 (40.0)		
6		237 (13.5)	
7		267 (15.2)	
8		314 (17.8)	
9		303 (17.2)	
10		321 (18.2)	
11		320 (18.2)	
12			258 (25.4)
13			233 (22.9)
14			196 (19.3)
15			120 (11.8)
16			103 (10.1)
17			48 (4.7)
18			34 (3.3)
19			18 (1.8)

20	3 (0.9)
21	2 (0.2)
22	1 (0.1)

Note. Brackets contain the percentages of each total score's representation of the risk level.

Table 46. Distributions for all offenders using SPRA total scores and the proposed SPRA risk levels.

	Low	Medium	High	Very High
0	1 (0.2)			
1	11 (2.2)			
2	58 (11.6)			
3	93 (18.7)			
4	136 (27.3)			
5	199 (40.0)			
6		237 (13.5)		
7		267 (15.2)		
8		314 (17.8)		
9		303 (17.2)		
10		321 (18.2)		
11		320 (18.2)		
12			258 (28.4)	
13			233 (25.6)	
14			196 (54.4)	
15			120 (33.3)	
16			103 (11.3)	
17				48 (45.3)
18				34 (32.1)
19				18 (17.0)

20	3 (2.8)
21	2 (1.9)
22	1 (0.9)

Note. Brackets contain the percentages of each total score's representation of the risk level.

Table 47. Means of total SPRA scores categorized by recidivists and non-recidivists.

	Frequency	Mean SPRA Score
Recidivists	1,036	11.35
Non-Recidivists	2,240	8.78

Table 48. Item-total statistics.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Age	8.83	13.734	.071	.083	.631
Gender	8.82	14.030	-.022	.058	.641
Prior Convictions	8.12	11.276	.385	.289	.584
Convictions For	8.50	10.679	.311	.266	.608
Residence Stability	8.73	12.136	.219	.085	.620
Academic/Vocational	9.39	13.247	.254	.120	.613
Unemployed	9.16	12.641	.355	.441	.598
Employment Stability	9.18	12.542	.389	.462	.594
Financial Situation	9.49	13.728	.141	.059	.624
Family/Marital	9.32	13.335	.186	.083	.619
Peers/Companions	8.81	11.433	.452	.270	.573
Drugs/Alcohol	8.32	11.444	.356	.212	.590
Antisocial Behaviour	9.54	13.782	.187	.054	.623
Attitude	8.93	12.469	.262	.202	.609
Self-Management	9.11	13.169	.198	.163	.618

Table 49. Factor analysis of SPRA items.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Employment Stability	.850					
Unemployed	.837					
Academic/Vocational	.567					
Prior Convictions		.810				
Convictions For		.791				
Self-Management			.772			
Attitude			.766			
Drugs/Alcohol				.673		
Peers/Companions				.664		
Age		-.339		.547		.342
Residence Stability				.537	.423	
Financial Situation					.682	
Antisocial Behaviour					.630	
Gender						.719
Family/Marital			.402			-.570

Table 50. Frequency and percentages of SPRA items endorsed for all offenders.

	Frequency	Percent
Age		
40 or over (0)	773	23.6%
39 or less (1)	2,503	76.4%
Gender		
Male (1)	2,521	77.0%
Female (0)	755	23.0%
Number of Prior Criminal Code Convictions		
None (0)	738	22.5%
1 conviction (1)	276	8.4%
Two or more (2)	2,262	69.0%
Convictions For		
Not applicable (0)	1,572	48.0%
Fraud, forgery, worthless cheques (1)	119	3.6%
Theft, break and enter, robbery (2)	1,301	39.7%
Convictions for both of the above (3)	284	8.7%
Residence Stability		
None (0)	1,425	43.5%
One (1)	881	26.9%
Two or more (2)	970	29.6%
Academic and Vocational Skills		
Completed grade 10 or marketable skill (0)	2,638	80.5%
Has less than grade 10 and no marketable skill (1)	638	19.5%
Unemployed at Time of Offence		
Employed at time of offence (0)	1,859	56.7%
Unemployed at time of offence (1)	1,417	43.3%
Employment Stability		
Employed 50% or more over last 12 months (0)	1,940	59.2%
Unemployed 50% or more over last 12 months (1)	1,376	40.8%
Financial Situation		
No serious problems (0)	2,941	89.8%
Evidence of serious problems (1)	335	10.2%
Family/Marital Relationships		
Pro-social support (0)	2,383	72.7%
Antisocial support/lack of pro-social support (1)	893	27.3%
Peers and Companions		
No known problems with peers (0)	1,276	38.9%
Some problems with some peers (1)	1,440	44.0%
Associates mainly with negative peers (2)	560	17.1%
Drug and Alcohol Use		
No evidence of impact (0)	813	24.8%
Evidence of impact in one area (1)	782	23.9%
Evidence of impact in two or more areas (2)	1,681	51.3%

Antisocial Behaviour		
No evidence of a pattern of antisocial behaviour (0)	3,108	94.9%
Evidence of a pattern of antisocial behaviour (1)	168	5.1%
Attitude		
Attitudes Pro-social and supportive of justice system (0)	1,481	45.2%
Either some pro-criminal attitudes or not supportive of justice system (1)	1,443	44.0%
Pro-criminal attitude and not supportive of justice system (2)	352	10.7%
Self-Management		
Good insight and strategies (0)	1,716	52.4%
Lack of insight and strategies (1)	1,560	47.6%

Note. Item value in brackets next to item description.

Appendix C: Figures

Figure 1. ROC curve predicting recidivism for all offenders (AUC = .695, CI = .676 – .714).

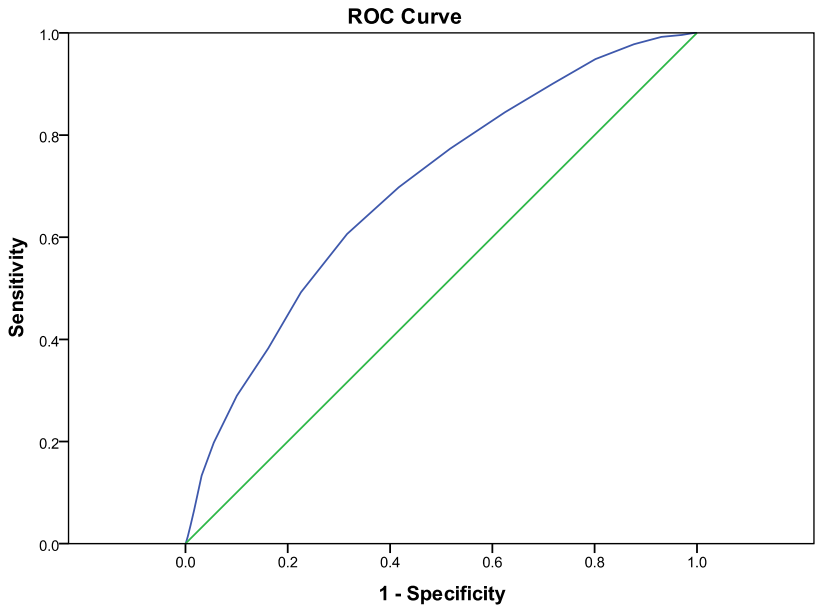

Figure 2. ROC curve predicting recidivism for PAC offenders (AUC = .658, CI = .582 – .735).

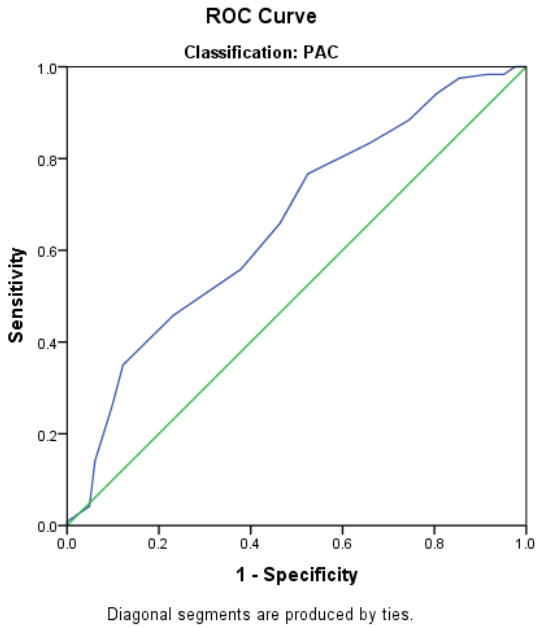

Figure 3. ROC curve predicting recidivism for CC offenders (AUC = .688, CI = .667 – .708).

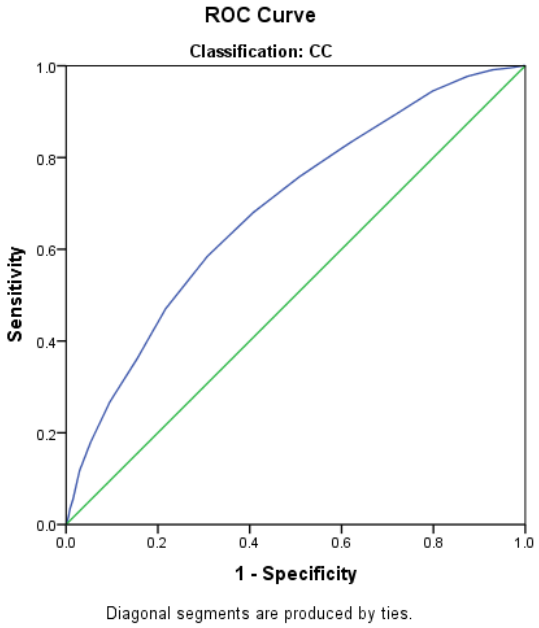

Figure 4. ROC curve predicting recidivism for male offenders (AUC = .698, CI = .677 – .720).

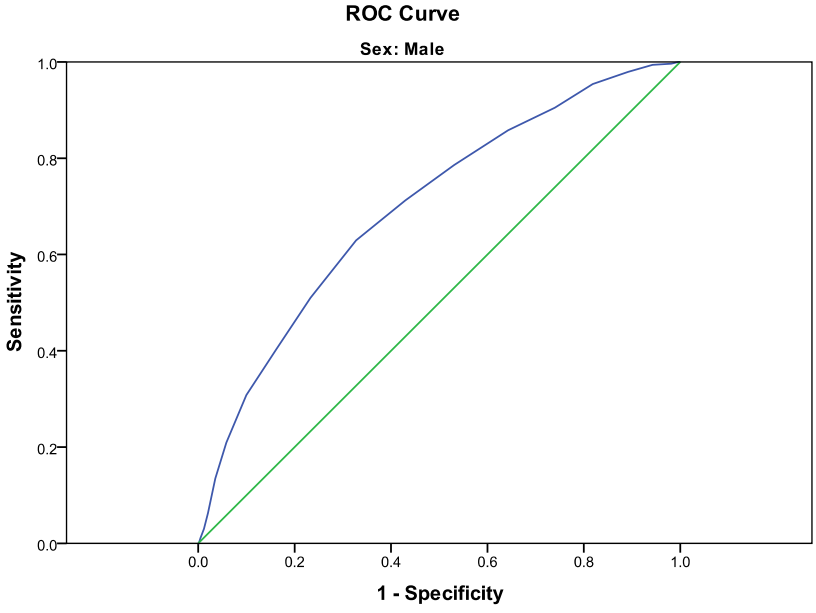

Figure 5. ROC curve predicting recidivism for female offenders (AUC = .678, CI = .637 – .719).

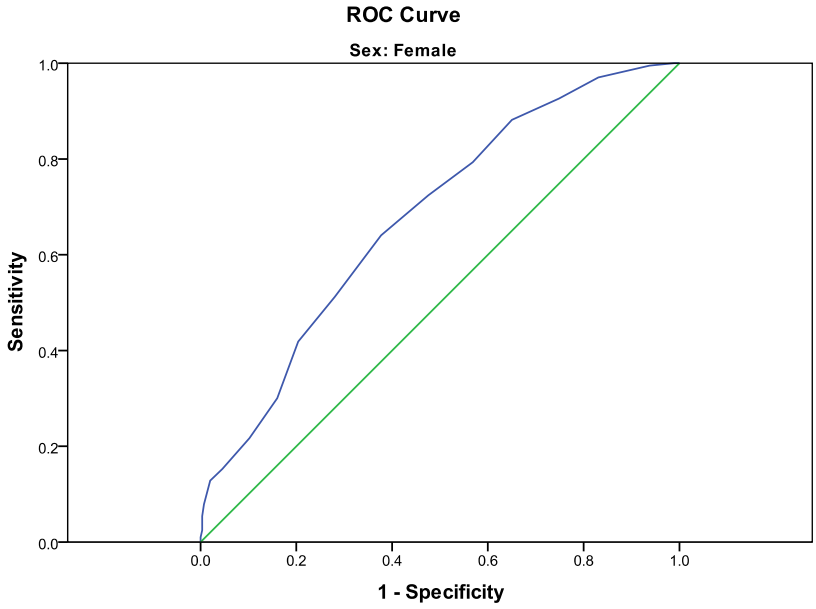

Figure 6. ROC curve predicting recidivism for all offenders with current SPRA risk levels (AUC = .664, CI = .644 - .684).

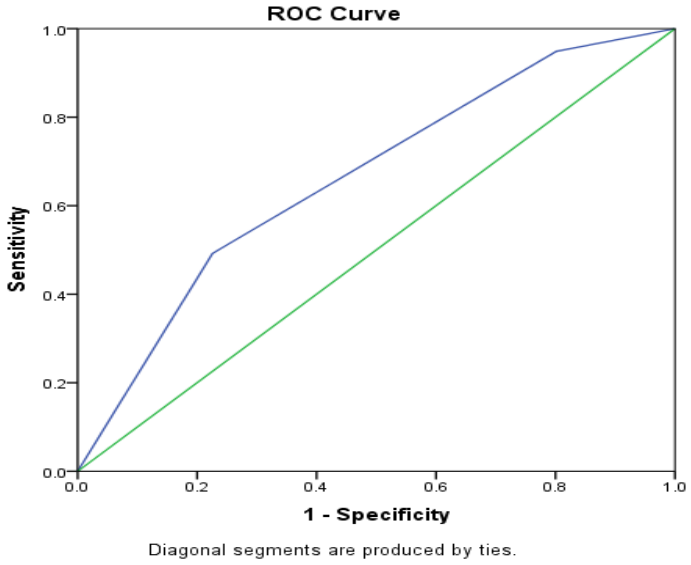

Figure 7. ROC curve predicting recidivism for all offenders with proposed SPRA risk levels (AUC =.667, CI = .647 - .687).

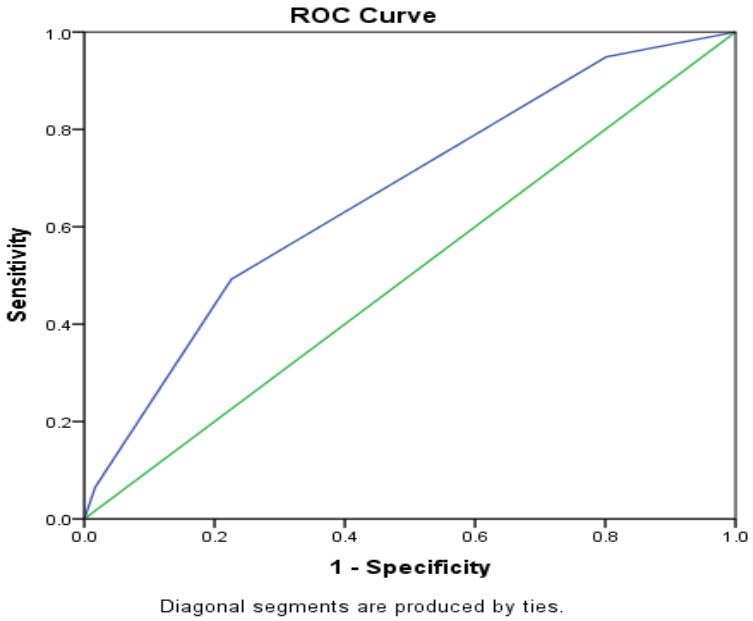

Figure 8. Survival curve for all offenders' general recidivism.

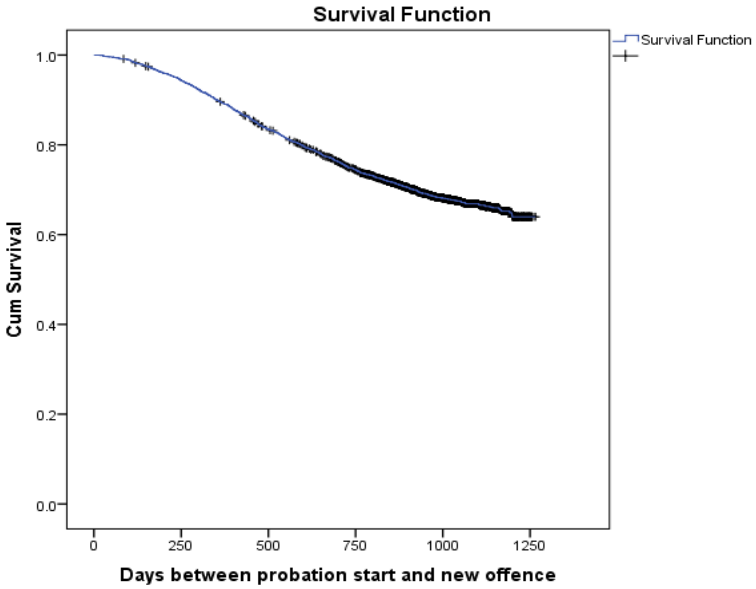

Figure 9. Survival curves for all offenders' general recidivism categorized by sex.

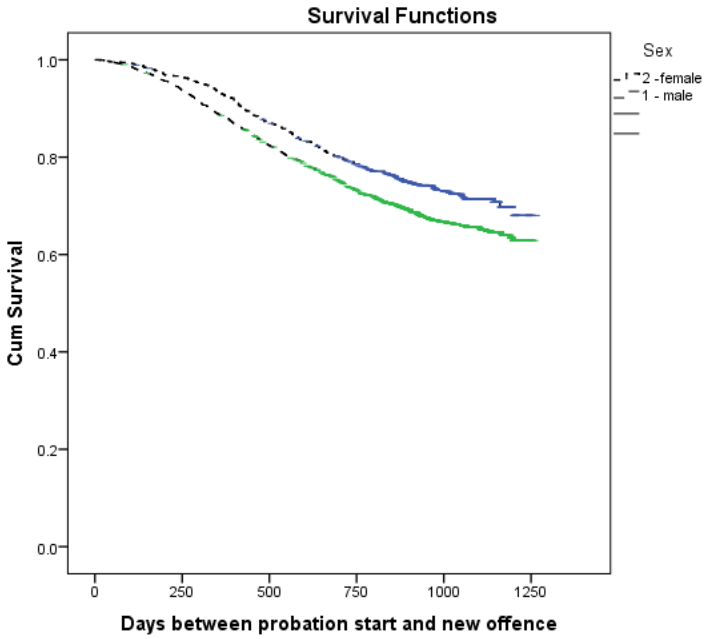

Figure 10. Survival curves for all offenders' recidivism categorized by age groups.

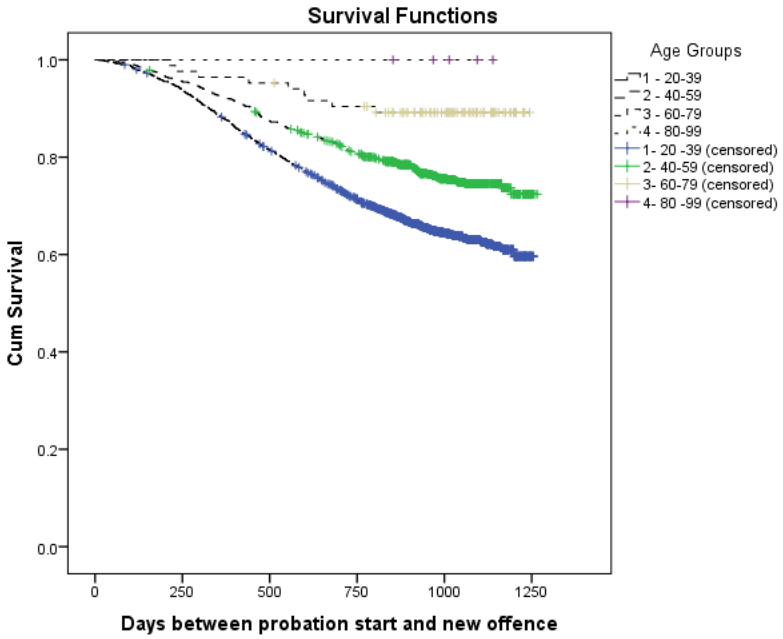

Figure 11. Survival curves for all offenders' recidivism categorized by ethnicity.

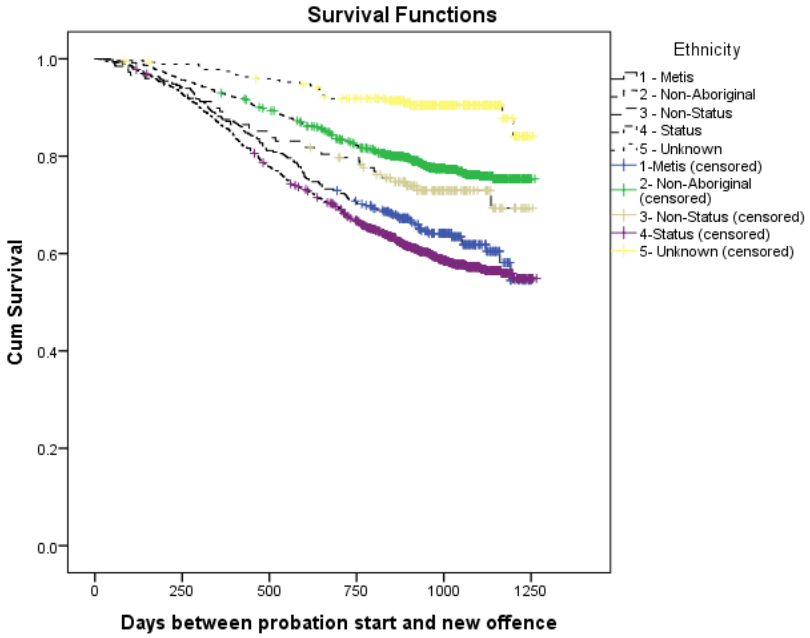

Figure 12. Survival curves for all offenders' recidivism categorized by education.

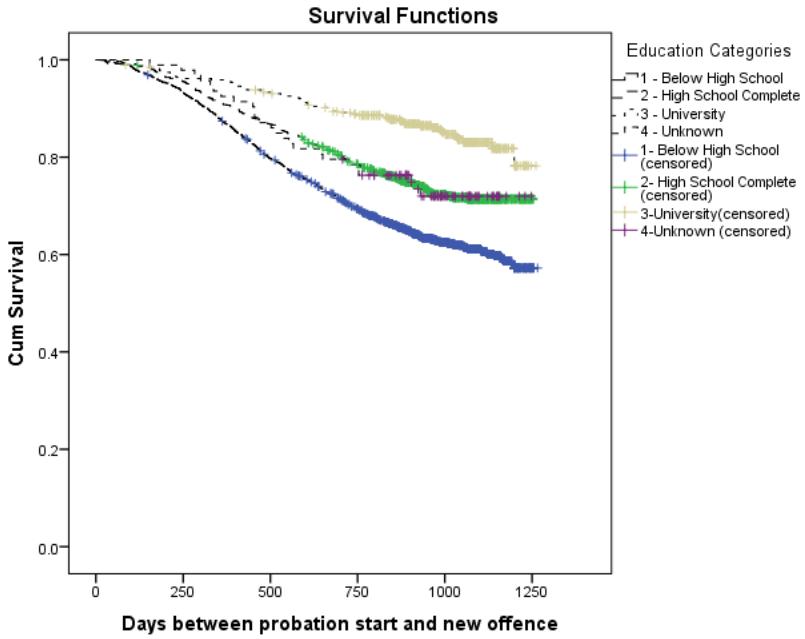

Figure 13. Survival curves for all offenders' recidivism categorized by current SPRA risk levels.

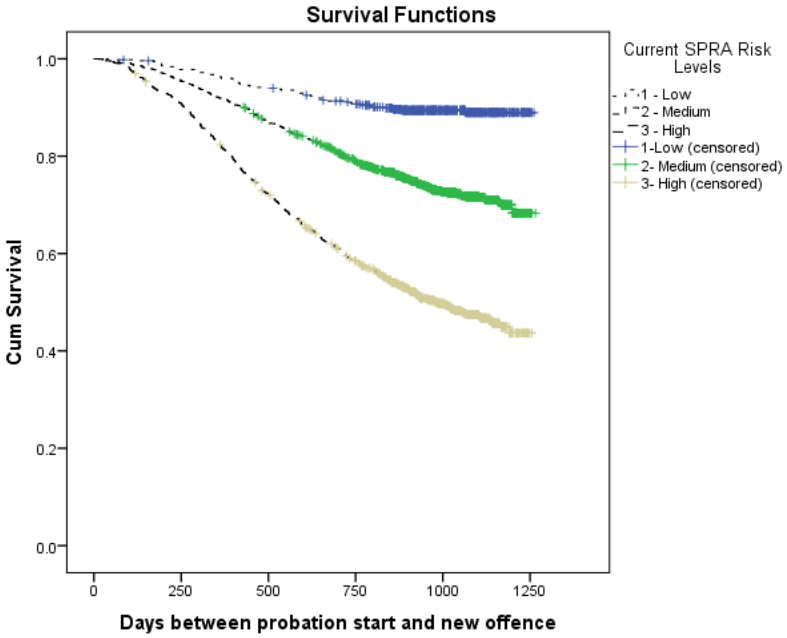

Figure 14. Survival curves for all offenders' recidivism categorized by proposed SPRA risk levels.

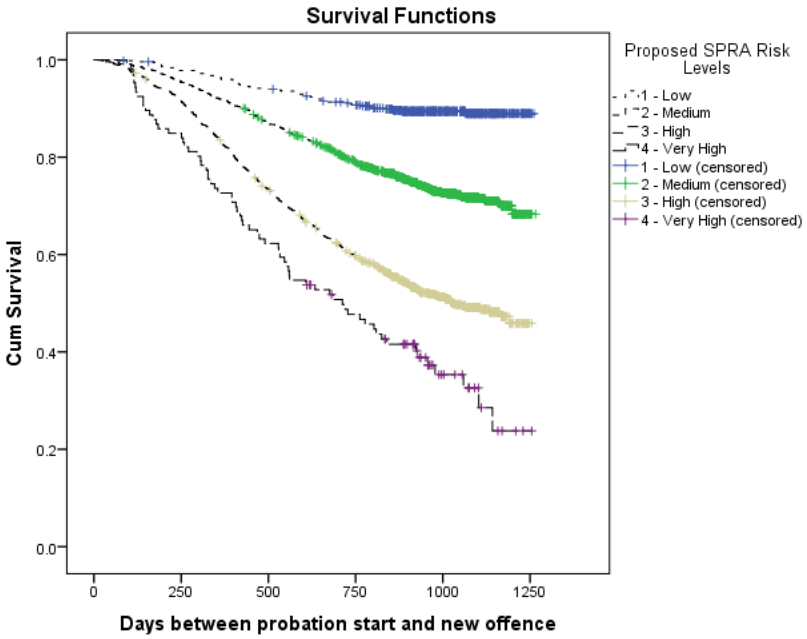

Figure 15. Frequencies of all offenders by SPRA total score.