The Predictive Validity of Aboriginal Offender Recidivism with a General Risk/Needs Assessment Inventory

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Abstract

Aboriginal people account for three percent of the Canadian population and 20% of custodial offenders; such over-representation highlights the importance of validating risk assessment tools on this population. This study examined the applicability of a general risk/need assessment tool, with a classification override component (LS/CMI) on a large cohort of provincial offenders. Aboriginal offenders (n=1,692) were significantly younger (35.7 vs. 38.1 years) than Nonaboriginal (n=24,758), had a higher proportion of females (24.7% vs. 17.8%), higher LSI-OR total scores (20.7 vs. 11.8), and higher rates of general (57.0% vs. 33.08%) and violent recidivism (15.0% vs. 12.4%). The application of the clinical override did not impact the predictive validity for the Aboriginal offenders, yet decreased predictive ability for Nonaboriginal offenders. Despite the demographic differences, the analyses in this study strengthen the argument that the LS family of risk assessment instruments can be used reliably and validly in the assessment of Aboriginal offenders: alpha levels (.92 vs. .91), ROCs (.70 vs. .74) and correlations between risk and recidivism (.36 vs. .41) were strong for Aboriginals. Comparisons between other offender groups, policy implications and future directions are discussed.

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The Debate about the Application of General Risk/Need Assessment to Aboriginal Offenders

It is important to ensure that risk assessment instruments are reliable and valid in all special populations they are used on. Of particular interest with respect to Canadian risk assessment tools is their applicability and utility with Aboriginal samples. In Canada, approximately 20% of offenders in custody are Aboriginal, yet Aboriginal people account for only three percent of the Canadian population (Brzozowski, Taylor-Butts & Johnson, 2006). This highlights the importance of ensuring that these tools are validated on offender samples of differing ethnicity. This is crucial in the criminal justice system since most of these tools are being administered on multiple samples, yet their validity in these samples is often not very well known.

Research has demonstrated a number of differences between Caucasians and Aboriginals in Canada. Aboriginal Canadians generally suffer from higher unemployment rates, lower incomes, and lower education when compared to Caucasian Canadians. They are also more likely to live in crowded conditions, relocate more frequently, and come from single parent families (Brzozowski et al., 2006). These differences again highlight the importance of ensuring reliable and valid risk assessments are being performed on both Aboriginal and Caucasian offenders.

Specifically, in looking at the Level of Service family of instruments, the original LSI was shown to accurately predict recidivism in an Aboriginal male sample as early as the 1980s. Bonta (1989) found that the average LSI scores and recidivism level was approximately the same for Native American and non-Native American male offenders. According to Coulson et al. (1996) the finding indicates that the LSI offers a bias-free prediction of criminal behaviour for different cultural groups. In another study, Tanasichuk and Wormith (2009) analyzed whether the LSI-OR could be used as a valid measure in a sample of Aboriginal offenders in the Ontario. Despite criticisms against using the LSI-OR for assessing the risk of ethnic minorities, these results suggested that the LSI-OR was valid in both male and female Aboriginal offenders for general and violent recidivism (Tanasichuk & Wormith, 2009). However, this study lacked a comparison group of Nonaboriginal offenders; therefore, the results must be interpreted cautiously. Regardless, the above noted studies provide promising results that add weight to the argument that the Level of Service family of instruments is acceptable for use in minority samples, or at least in the Aboriginal population. In their conclusion, Tanasichuk and Wormith (2009) suggest that their findings indicate that the LSI-OR should continue to be used in Ontario as an appropriate risk/need assessment tool for Aboriginal offenders, as it is empirically backed.

Holsinger et al. (2003) looked specifically into the predictive ability of the Level of Service Inventory – Revised (LSI-R) on an Aboriginal and Nonaboriginal sample. They found a significant difference between these two offender groups on the overall risk score and within several of the 10 risk domains. Although several differences emerged from their analyses, the authors acknowledged the need for further analyses as they had a relatively short follow-up time,

and could only use very basic demographic information on the offenders. When the authors revisited this data in more detail in 2006, they found more promising results by utilizing survival analyses (Holsinger, Lowenkamp & Latessa, 2006). They found good predictive validity for the LSI-R total risk score as supported by appropriate survival rates, even when race and sex were controlled for. However, predictive validity was better for Caucasian male and female offenders (Holsinger et al., 2006). These results were similar to those of Bonta (1989) who validated the LSI-R for Aboriginal offenders in Canada, yet still found that the tool was more predictive in the Nonaboriginal sample. Therefore, although these past validation studies have yielded positive findings, the differences in predictive validity shows a need for more research.

The Current Investigation

This study was designed to address two important questions about risk assessment of Aboriginal offenders; one to examine the utility of a general risk/need instrument (LS) with Aboriginal offenders on various kinds of outcome; and two, to investigate the use of professional judgement to augment the risk/need assessment. It did so by examining Aboriginal offenders who were extracted from a large cohort of Canadian provincial offenders (probationers and prisoners). Descriptive statistics were generated on a number of legal and demographic variables, the LS, and two kinds of recidivism outcome (any and violent). The predictive validity of the LS was determined for both types of recidivism both for Aboriginal offenders on probation and those who were released from custody. Supplementary professional judgment was investigated by means of the "override" feature of LS. The extent and circumstances of its use were examined as was its impact on the predictive validity of LS. All of the above analyses were also conducted on the remainder of the cohort, the Nonaboriginal offenders, primarily for comparison purposes.

Methodology

Sample

The sample was derived from a cohort of offenders who were under the responsibility of the province of Ontario, Canada. The original cohort included all male and female offenders who, during one calendar year (2004), were released from Ontario provincial correctional facilities after serving a sentence of at least one month,[1] were sentenced to a conditional sentence (to be served in the community), or began a term of probation with the Ministry of Community Safety and Correctional Services (MCSCS). The sample consisted of all offenders in the cohort who had been administered an LSI-OR in conjunction with their sentence. The Aboriginal Offender sample was made up of 1,692 offenders of whom 1,274 (75.3%) were male and 418 (24.7%) were female. Broken down by type of disposition, they included 603 (35.6%) inmates who were released from a prison sentence (559 males and 44 females), 198 (11.7%) offenders who were given a conditional sentence to be served in the community (132 males and 66 females), and 891 (52.7%) offenders who were given a term of probation (583 males and 308 females). Their mean age at the date of data extraction was 35.71 (SD = 10.08). Prisoners were sentenced to an average of 185.13 (SD = 126.85) days in custody and 139.75(SD = 157.61) days under community supervision. Those on a conditional sentence were sentenced to an average sentence of 223.57 (SD = 158.91) days. Probationers were sentenced to an average of 433.73 (SD = 218.90) days on probation.

[1] In Canada, all offenders who are sentenced to less than two years are placed under provincial responsibility.

The Nonaboriginal offender sample consisted of 24,758 offenders of whom 20,342 (82.2%) were male and 4,416 (17.8%) were female. Broken down by type of disposition, they included 4,347 (17.6%) inmates who were released from a custodial sentence (4096 males and 251 females), 3027 (12.2%) offenders who were given a conditional sentence to be served in the community (2,386 males and 641 females), and 17,384 (70.2%) offenders who were given a term of probation (13,860 males and 3,524 females). Their mean age at the date of data extraction was 38.09 (SD = 11.79). Prisoners were sentenced to an average of 197.64 (SD = 139.23) days in custody and 155.35(SD = 222.04) days under community supervision. Those on a conditional sentence were sentenced to an average of 280.74 (SD = 196.00) days. Probationers were sentenced to an average of 456.08 (SD = 236.03) days on probation.

Prediction and Outcome Measures

LSI-OR

The Level of Service Inventory - Ontario Revision (LSI-OR; Andrews, Bonta & Wormith, 1995) is described as a fourth generation risk assessment tool in that it goes beyond traditional risk and needs by including other clinically relevant factors and incorporating a case management portion (Andrews Bonta & Wormith, 2007), thus extending beyond its predecessor the Level of Service Inventory - Revised (LSI-R; Andrews & Bonta, 1995). The instrument includes a general risk/need section consisting of 43 items each of which is scored in a dichotomous fashion (0 = not present or 1 = present). The items are organized into the central eight (Andrews & Bonta, 2010) subscales: criminal history (8 items), education/employment (9 items), family/marital (4 items), leisure/recreation (2 items), companions (4 items), procriminal attitude/orientation (4 items), substance abuse (8 items), and antisocial pattern (4 items).

These items are totalled to create eight domain scores and a total general risk/need score, which is then used to determine the offender's initial risk level on a five-point ordinal scale ranging from very low risk to very high risk. The initial risk level may be overridden in either direction (i.e., from a lower to higher risk level or from a higher to a lower risk level) to create a final risk level. The two level variables were coded from 1 to 5 and an "override score" was calculated by subtracting the initial risk level score from the final risk level score. For example, a score of +2 would indicate that the override was used to increase the risk level by two levels, while a score of 0 would indicate that no change was made to the initial risk level. The total general risk/need score of the LSI-OR correlates very highly with the 54 item LSI-R (r = .96; Rowe, 1999; Andrews, Bonta & Wormith, 2004). The general risk/needs score has demonstrated predictive validity for general offenders and Aboriginal offenders for any recidivism (r = .39 and .41, respectively) and for violent recidivism, which includes sexual recidivism (r = .28 and .31, respectively; Wormith & Girard, 2004).

The specific risk/need section contains two subscales: personal problems with criminogenic potential (14 items) and history of perpetration (9 items), also scored dichotomously. These items are intended to identify additional risk factors and criminogenic needs, as well as guide the assessors in deciding whether the risk level should be adjusted or "overridden". The specific risk/need section correlated with general and violent recidivism for Nonaboriginal offenders (r = .43 and r = .30, respectively) and for Aboriginal offenders (r = .38 and r = .17). The LSI-OR consists of three additional sections intended to guide case management; institutional factors (10 items), which records problems and management issues during previous incarcerations, other client issues (18 items), which includes social, health and

mental health issues that are likely to deserve particular attention, and special responsivity considerations (8 items), which include characteristics such as ethnicity, cognitive disabilities and personality features that are relevant to how one works with an offender. The LSI-OR also includes a strength score, which is a simple summation of the number of central eight subscales that constitute a strength or protective factor for the offender (Andrews, Bonta & Wormith, 1995).

Recidivism

For the purpose of the current study, recidivism was defined as any criminal offense for which an offender was returned to MCSCS. These offenses are recorded in the Offender Tracking and Information System (OTIS), which is operated by MCSCS and documents all criminal offenses that occur in Ontario. However, there are some limitations to this data source. Any offenses committed outside the province of Ontario could not be included, nor were any convictions that lead to sentences other than incarceration or community supervision (e.g., fines, suspended sentences, and alternative measures).

Four measures of recidivism were constructed from offender file information. First, a dichotomous variable (yes = 1, no = 0) was created to identify those who did and did not recidivate during the follow-up period. The second recidivism variable was the time to recidivate, which was measured in the number of days that offenders were in the community and eligible to recidivate. Thus, for the custodial sample, the time to recidivate was represented by the number of days from their release date to the date of reoffense or re-entry into custody. In the community sample, this was the time between the LSI-OR assessment date and the data extraction date when files were reviewed for evidence of further contact with the criminal justice system. Hence, the follow-up period ran from offenders' release from custodial sentence or their admission to community supervision in 2004 to the extraction date in January, 2009.

The third recidivism variable included was the Offense Severity Scale (OSS; Stasiuk, Winter & Nixon, 1996), which was coded based on 26 categories that were rank ordered in accordance with the mean sentence length for each offense category (Ontario, 1983). This scale was originally developed by MCSCS from an analysis of 60,000 sentences given to offenders in Ontario over a period of one year, where the average sentence length determined offense severity (Stasiuk et al., 1996). Offense categories ranged from 0 (no reconviction) and 1 (municipal bylaw offences), to 24 (serious violent offences) and 25 (homicide). Offenses with unknown severity were coded as missing. The OSS categories were used to categorize offenders' index offenses as well as their recidivistic offenses (Appendix A). Finally, dichotomous violent recidivism consisted of six categories from the OSS (Assault and Related; Miscellaneous Offenses Against the Person; Weapons Offenses; Non-Violent Sexual Offenses; Serious Violent Offenses).

Procedure

Offenders who were released from a custodial sentence or who were admitted to a conditional sentence or to probation in 2004 were identified electronically from the Ministry's Offender Tracking and Information System (OTIS). Descriptive information was obtained from OTIS including age, gender, and self-reported racial background [Aboriginal (i.e., First Nation, Metis and Inuit) and Nonaboriginal]. An automated version of the LSI-OR was introduced into the organization in 1997 allowing field staff to enter all details of their assessment into an electronic record for scoring and record keeping. The LSI-OR is administered to all adult

inmates who are sentenced to at least one-month custody and to all probationers and parolees in Ontario (Wormith, 1997). Therefore, a computer search on the LSI-OR database was then conducted to identify all inmates of the cohort who had been administered an LSI-OR during their period of incarceration in 2004 and all community offenders in the cohort who had been administered an LSI-OR at the outset of their community supervision, also in 2004.

Any evidence of recidivism, as indicated by a reconviction, was then recorded for each offender and saved in the derived database in January, 2009. Aboriginal offenders and Nonaboriginal offender groups were created based on the self reported race extracted from the OTIS database. General and violent recidivism was coded according to the offense categories described previously. The data from the two data files were then merged by offender identification number into a single file for data analyses. Consequently, the final data file included descriptive legal and demographic information about the offender, including variables to identify Aboriginal and Nonaboriginal offenders and the type of sentence that was being served (prison, conditional sentence or probation), the LSI-OR total and item scores, and the measures of recidivism.

Data Analysis

Although the prime focus of this investigation was on Aboriginal offenders, many of the following analyses were conducted on both Aboriginal offenders and Nonaboriginal offenders in order to compare the performance of the LSI-OR with Aboriginal offenders to the larger overall offender population. By making these comparisons from a common cohort, one avoids the difficulty of making comparisons from different agencies with data collected at different times, assessments conducted by different assessors, and measured against different operational definitions of the outcome variable.

A variety of statistical procedures were performed on the data set. Descriptive statistics were obtained on the sample of Aboriginal offenders and comparisons made to the remainder of the cohort the Nonaboriginal offenders as well as comparisons within the Aboriginal offenders by type of sentence. Reliability analysis was limited to assessments of internal consistency using Cronbach's (1951) coefficient alpha. Predictive validity was assessed with correlations, ROC curves (Hanley & McNeil, 1983), and survival analysis. Given the size of the data set, it was also decided to examine the predictive validity of individual items from the LS and compare these correlations between the Aboriginal offender and Nonaboriginal offender sample to determine whether there was any particular pattern suggesting some items or kinds of items were more or less predictive of recidivism among Aboriginal offenders compared to the Nonaboriginal offender population. The impact of the override on predictive validity was assessed by comparing the magnitude of the difference in survival across risk levels before and after the override feature was exercised (i.e., initial and final risk level). Correlation and multiple regression analyses were used to identify offender characteristics that were related to the use of the override feature.

Results

Aboriginal offenders and Nonaboriginal offenders on Demographic Characteristics, LSI-OR and Recidivism

Descriptive and demographic characteristics were calculated for Aboriginal offenders and Nonaboriginal offenders and compared to each other in Table 1. Aboriginal offenders were significantly younger and more likely to be female than Nonaboriginal offenders. There was no

significant difference in the offence severity of Aboriginal and Nonaboriginal offenders. Aboriginal and Nonaboriginal offenders were also compared on a number of LSI-OR measures. Aboriginal offenders scored significantly higher on all LSI-OR summary measures, except strengths, on which there was no significant difference. These measures included the LSI-OR general risk/need total score and corresponding risk level, both before and after the uses of the override function, and the specific risk/need score. However, they scored significantly lower on the measure of risk level change indicating that assessors used the override feature to increase the risk level of the Nonaboriginal offenders significantly more than they did for Aboriginal offenders.

The recidivism rates of Aboriginal and Nonaboriginal offenders were compared. Aboriginal offenders had a higher rate of both general and violent reoffending than Nonaboriginal offenders and when they did reoffend did so more quickly. Recidivism (general and violent) of the Aboriginal offender sample was then investigated in more detail. First, the general recidivism rate of Aboriginal offenders (57.0%), was examined by gender, and type of sentence in Table 2. A one-way ANOVA revealed a significant main effect for disposition, F (2, 1689) = 63.59, p <.001. Since Levene's test was significant, F (2, 1689) = 63.59, p <.01, the Dunnett's C post hoc was performed. In terms of the disposition, those placed on a custodial sentence were more likely to recidivate (74.6%) than those placed on probation (47.0%) and those placed on a conditional sentence (48.5%). There was no significant difference in recidivism rates between those on probation and a conditional sentence. In addition, males (60.7%) were found to recidivate significantly more than females (45.9%), F (1,1690) = 28.35, p <.001.

Secondly, the violent recidivism rate of Aboriginal offenders (15.0%) was also examined by gender and type of sentence in Table 2. A one-way ANOVA revealed a significant main effect for disposition, F (2, 1689) = 23.67, p <.001. Since Levene's test was significant, F (2, 1689) = 97.07, p <.001, the Dunnett's C post hoc was performed. In terms of the disposition, the only significant difference was between those in custody (22.39%) and those on probation (9.65%). Those on a conditional sentence (16.16%) did not differ in terms of violent reconviction rate from the other dispositions. There was no significant difference between the violent recidivism rates of females (15.4%) and males (14.8%), F (1, 1690) = 0.06, p = .81.

Internal Consistency

Internal consistency of the LSI-OR was examined using Cronbach's alpha. This analysis was conducted on the total sample as well as the two main subgroups, Aboriginal offenders and Nonaboriginal offenders to assess whether the scale performed differently between the two offender groups. Since three of the LSI-OR items are actually calculated in part based on offenders' scores on previous items, the Alpha calculation was repeated without these three items. Analysis revealed strong alpha levels for both the 43-item LSI-OR (□ = .92) and the 40-item LSI-OR (□ = .91) on the full sample. As expected and reported previously (Andrews, Bonta, & Wormith, 2004), the alpha coefficient was lower and quite varied for the eight domains of the general risk/need section. Small coefficients were systematically related to domains having few (two or four) items. When examined by offender type, there was actually a slight, but consistent, increase in alpha coefficients with the Aboriginal offender sample. These alpha rates, as well as the alpha rates for all of the subscales, are presented for Aboriginal offenders, Nonaboriginal offenders and the total sample in Table 3.

Predictive Validity of the LSI-OR

The correlations between the LSI-OR and general and violent recidivism were examined for the complete sample, as well as the Aboriginal offenders and Nonaboriginal offenders to assess the applicability of the LSI-OR to a Aboriginal offender population. These correlations were calculated for the general risk/need total score, as well as the eight domain scores and the additional sections of the LSI-OR, specifically the specific risk/need section and its two subsections (personal problems and perpetration history), other noncriminlogenic needs, responsivity, and strengths. The general risk/needs score was highly correlated with general recidivism ($r = .44$, $p < .001$) on the full sample and on the Aboriginal offender sample ($r = .38$, $p < .001$). Correlations on the full sample were lower for the prediction of violent recidivism ($r = .29$, $p < .001$) and even more so for Aboriginal offenders ($r = .17$, $p < .001$). Sources of the LSI-OR's predictive validity for general recidivism on the complete sample and the Aboriginal offenders are reflected in the coefficients from the central eight domains. The correlations with general recidivism were higher for Nonaboriginal offenders than Aboriginal offenders on the general risk/needs score, criminal history, education/employment, family/marital, leisure/recreation, companions, specific/risk needs, and prison experience. Aboriginal offenders were higher on procriminal attitudes, total strengths, barrier to release, and responsivity. In terms of predicting violent recidivism, Nonaboriginal offenders had higher correlations on all sections of the LSI-OR.

Concerning the less frequently examined section of the LSI-OR, the specific risk/need section, and both of its subscales were highly correlated with general recidivism for the full sample ($r = .33$, $p < .001$) and for the Aboriginal offenders ($r = .30$, $p < .001$). However, their correlations with violent recidivism for both Aboriginal and Nonaboriginal offenders, although significant, were substantially lower. Interestingly, noncriminogenic needs were also correlated with general recidivism both for Aboriginal offenders ($r = .30$, $p < .001$) and Nonaboriginal offenders ($r = .31$, $p < .001$), but less so for violent recidivism. Similarly, responsivity displayed modest correlation with general recidivism amongst Aboriginal offenders ($r = .22$, $p < .001$) and Nonaboriginal offenders ($r = .197$ $p < .001$), but less so with violent recidivism. As expected, strengths were negatively correlated with recidivism, although the coefficients were low both for Aboriginal offenders and Nonaboriginal offenders on general ($r = -.14$, $p < .001$, $r = -.12$, $p < .001$) recidivism and lower on violent recidivism.

Analyses of subgroups of Aboriginal offenders revealed similar patterns. For example, the general risk/need score correlated highly with general recidivism for both Aboriginal males and females ($r = .38$, $p < .001$ and $r = .31$, $p < .001$, respectively; Table 5), but less so for violent recidivism, ($r = .17$, $p < .001$ and $r = .20$, $p < .001$, respectively). All general risk/need subsections of the LSI-OR correlated well with general recidivism for Aboriginal males, but did not correlated for the females on the family/marital subscale ($r = .09$, *n.s.).*

When the Aboriginal offenders were grouped by type of sentence (custody, conditional sentence or probation), the correlations reflected the overall pattern (Table 7). The LSI-OR and its sections and domains predicted general recidivism very reliably for the custody and probation sample, but few correlations were significant for the conditional sentence sample, or in predicting violent recidivism. For example, the general risk/needs total score predicted general recidivism amongst custody offenders ($r = .33$, $p < .001$), conditionally sentenced offenders ($r = .28$, $p < .001$), and probationers, ($r = .26$, $p < .001$). The central eight domains and the other LSI-OR sections also predicted general recidivism well, but less so for both violent and sexual

recidivism, although specific risk/need section perpetration history was notably correlated with sexual recidivism among conditionally sentenced offenders ($r = .20$, $p < .001$).

Finally, a series of correlations was conducted to examine the LSI-OR risk levels with general and violent recidivism to examine the possible decrement in predictive validity when one collapses from a raw score (0 to 43) to a simple risk level (1 to 5) and when practitioners are allowed to override the score derived risk level based on other pieces of information and their professional judgment. The initial risk level is the score-derived level and the final risk level is the risk level after the override option has been applied. Results are presented for all offender groups on general and violent recidivism in Table 7. The correlations between the initial LSI-OR risk level for general and violent recidivism for the entire sample of Aboriginal offenders and the various subgroups mirror the correlations derived from the total score although, as one would expect, they consistently show a slight decrement in predictive validity. The initial risk level correlated $r = .36$, $p < .001$ with general recidivism, followed by $r = .17$, $p < .001$. The same pattern was found for Aboriginal offender subgroups defined by gender and type of sentence. For example, initial risk level correlated with general and violent recidivism among Aboriginal male offenders ($r = .35$, $p < .001$, and $r = .17$, $p = .059$, respectively), as it did with Aboriginal female offenders ($r = .30$, $p < .001$, and $r = .18$, $p < .001$).

When these analyses were repeated using the final risk level, the same pattern was found, with similar correlations across all Aboriginal offender subgroups and across the measures of recidivism. The final risk level correlated with general recidivism $r = .34$, $p < .001$, and violent recidivism $r = .15$, $p < .001$, on the complete sample of Aboriginal offenders. The same pattern was found for Aboriginal offender subgroups defined by gender and type of sentence. For example, final risk level correlated with general and violent recidivism among Aboriginal male offenders ($r = .34$, $p < .001$, $r = .16$ and $p < .001$), as it did with Aboriginal female offenders ($r = .30$, $p < .001$ and $r = .17$, $p < .001$).

ROC curves

A series of ROC analyses were conducted to examine the LSI-OR total and section scores with general and violent recidivism. As one would expect, the Areas Under the Curve (AUC) closely mirrored the pattern of correlations. AUC values are presented in Table 8. For example, the general risk/need total score produced an ROC of AUC = .76 for all offenders on general recidivism and virtually the same predictive ROC for Aboriginal offenders (AUC = .72) and Nonaboriginal offenders (AUC = .75). In terms of violent recidivism, the general risk/need total score produced an ROC of AUC = .73 for all offenders virtually the same predictive ROC for Aboriginal offenders (AUC = .64) and Nonaboriginal offenders (AUC = .74). The majority of coefficients for the domain scores and other section scores fell in the AUC = .60, $p < .001$, to .70, $p < .001$, range, indicating that the LSI-OR and its subscales are able to predict recidivism in both Aboriginal offenders and Nonaboriginal offenders.

Survival Analyses

Survival analyses (Kaplan-Meier) were performed on general and violent recidivism using both the initial risk levels and the final risk levels (i.e. after the override decision was applied) for both Aboriginal offenders and Nonaboriginal offenders. Mean survival times and the 95 percent confidence intervals for Aboriginal offenders and Nonaboriginal offenders using the initial risk levels and final risk levels are presented for general recidivism in Table 9, and for violent recidivism in Table 10. The overall comparison between risk levels and pair-wise

comparisons between all pairs of risk level are presented as Log Rank (Mantel-Cox) Chi-square analysis in Table 11.

In all cases, survival curves varied systematically and in the expected direction by risk level. The overall Log Rank (Mantel-Cox) Chi-Square (1) linear trend statistic was significant, $p < .001$, for all survival functions using both the initial and final risk level categories on both Aboriginal offenders and Nonaboriginal offenders. Some minimal evidence for the decrement in predictive validity that was found with the introduction of the override function in previous analyses was also found in the survival analyses for Aboriginal offenders and Nonaboriginal offenders. The general pattern of findings was that there was a small, but systematic reduction in Chi Square values for the prediction of both general and violent recidivism on both Aboriginal and Nonaboriginal offenders. However, with a couple of exceptions (low vs. moderate risk and moderate vs. high risk when predicting violent recidivism among aboriginal offenders) the level of p-values (ie, .05, 01 and .001) did not change (Table 11). For Nonaboriginal offenders, all comparisons between final risk levels remained highly significant, $p < .001$ because of the extremely high sample size. Survival curves for general and violent recidivism using the initial and final (override) risk levels are portrayed for Aboriginal offenders and Nonaboriginal offenders in Figure 1 through 8.

These findings raise questions about the value of the override feature and the apparent loss of predictive validity when this option is afforded to practitioners. It appears as though this problem is less pronounced in the Aboriginal offender sample. However, since the application of the override is designed to allow for clinical judgement, in order to hopefully increase predictive validity, these findings require more analysis. For example, in what situations are assessors more likely to invoke the override with Aboriginal offenders and, if so, in what direction do they apply it? Secondly, how does its use affect the predictive validity of the instrument and what factors precipitate its use?

Item Analysis of LSI-OR Items

Correlations between all items found in each of General Risk/Needs (Section A), Specific Risk/Needs(Section B), Social, Health and Mental Health (Section D), and Responsivity (Section G) were computed with the three measures of recidivism, general, violent and sexual. Due to the magnitude of this output, results are presented in Appendix B.

As individual (binary) items are not expected to generate large correlations with the criterion variable, hence the creation of scales with multiple, diverse items, the current results are encouraging. Most items correlated with general recidivism, both for Aboriginal offenders and Nonaboriginal offenders. This finding is encouraging for the applicability of a general risk/need assessment tool, like LSI-OR, to the Aboriginal offender population.

Use of the Override

A number of analyses were performed to determine when the override was used and how its use impacted on the predictive validity of the instrument. As can be seen in Table 12, both the correlations and the AUC values are routinely higher for the initial risk level than the final (override) risk levels in the prediction of general and violent recidivism on the complete sample. For Nonaboriginal offenders, the original risk levels provide a better predictor than those derived after the professional override is applied as correlations decrease from $r = .41$, $p < .001$, to $r = .35$, $p < .001$, for general recidivism, and from $r = .28$, $p < .001$, to $r = .23$, $p < .001$, for violent recidivism. For Aboriginal offenders there were decrements from $r = .36$, $p < .001$, to $r = .34$, p

<.001, for general recidivism, from $r = .17$, $p < .001$, to $r = .15$, $p < .001$. Moreover, it is noted that the override option was exercised much more frequently to increase risk (14.9%) than to decrease (1.6%) risk. This difference was much less pronounced in the adjustment to Aboriginal offender risk level (5.4 % increase and 3.8 % decrease in risk level) compared to Nonaboriginal offenders (15.5 % increase and 1.4 % decrease; χ (2) = 178.23, $p < .001$).

In an effort to determine what may have contributed to the decrement in predictive validity with the use of the override function, two additional analyses were performed. First, the Aboriginal offender sample was assigned to an initial-by final risk level matrix and recidivism rates within each cell were examined (Table 12). The small sample size in some cells precluded statistical analysis. However, inspection of the recidivism rates across the initial-final risk level cells is consistent with a slight decrement in predictive validity of the assessment process. Although it appears as though those offenders decreased in risk level were done so appropriately, as evident by the lower recidivism rates for those below the diagonal line representing those with no change. However, it appears as though those who had been increased, shown above the diagonal, there were lower recidivism rates than those who were not increased. Generally speaking, the relatively few Aboriginal offenders (n = 64) who were overridden to a lower risk level, collectively, seem to have been done appropriately as their recidivism rates were lower than their unadjusted counterparts. For example, the recidivism rate of the 29 very high risk Aboriginal offenders whose risk levels were reduced was considerably lower (69.0%) than their unadjusted counterparts (82.2%).

A second strategy was to examine the relationship between the risk category change score and a number of demographic and LSI-OR variables. However, since changes in risk level by means of the override were highly related to the LSI-OR total score (Table 14) simply because of the asymmetry of the override process (i.e. high risk offenders are already high risk and close to the ceiling and therefore are more likely to be overridden downward, while low risk offenders have much more room available to be overridden upwards), partial correlations controlling for risk level were computed (Table 14). For Aboriginal offenders, controlling for risk, increases in risk level by means of the override was not correlated with age, although it was negatively related to being female (r = -.05, $p = .04$). Among LSI-OR scales, it was correlated with Total Specific Risk/Needs ($r = .18$, $p < .001$) and its subscales personal problems with criminogenic potential ($r = .18$ $p < .001$) and history of perpetration ($r = .11$, $p < .001$), prison experience ($r = .08$, $p < .001$), social, health and mental health problems ($r = .05$, $p = .03$) and responsivity considerations ($r = .14$, $p < .001$). It was also correlated with four general risk/need subscales; education/employment ($r = -.08$, $p < .001$), companions ($r = -.07$, $p = .006$), substance abuse ($r = .06$, $p = .018$), and antisocial pattern ($r = .06$, $p = .019$).

For Nonaboriginal offenders, controlling for risk, increases in risk level was correlated with age ($r = .10$, $p < .001$) and negatively with being female ($r = -.10$. $p < .001$). Among LSI-OR scales, it was correlated with Total Specific Risk/Needs ($r = .20$, $p < .001$) and its subscales personal problems with criminogenic potential ($r = .19$, $p < .001$) and history of perpetration ($r = .12$, $p < .001$), prison experience ($r = .06$, $p < .001$), strengths ($r = -.03$, $p < .001$), social, health and mental health problems ($r = .04$, $p < .001$) and responsivity considerations ($r = .15$, $p < .001$). It was also correlated with six of the eight general risk/need subscales; education/employment ($r = -.06$, $p < .001$), family/marital ($r = .06$, $p < .001$), companions ($r = -.07$, $p < .001$), procriminal attitudes ($r = .10$, $p < .001$), substance abuse ($r = -.02$, $p < .001$) and antisocial pattern ($r = .09$, $p < .001$). These findings were then used in the next set of analyses.

Demographic and LSI-OR variables that were correlated with change in risk in either sample were included in multiple regression analyses on change in risk for Aboriginal and Nonaboriginal offenders. For Aboriginal offenders, after entering LSI-OR total score in block one (R^2 = .079; F (1,1690) = 145.00, p < .001), the remaining demographic and LSI-OR measures in block two improved the regression analysis (R^2 = .128; F(15,1676) = 16.425, p < .001) in a significant way, (change in R^2 = .05); F_{change} (14, 1676) = 6.75, p < .001). Measures that were related to change in risk level, independent of risk score included substance abuse (B = .023, p = .006), antisocial pattern (B = .043, p = .028), personal problems with criminogenic potential (B = .034, p < .001), history of perpetration (B=.020, p<.001) and responsivity (B = .035, p = .036) being significant factors (Table 15).

For Nonaboriginal offenders, after entering LSI-OR total score in block one (R^2 = .092; F (1, 24755) = 2504.84, p < .001), the remaining demographic and LSI-OR measures in block two (R^2 =.154; F (15,24741) = 299.86, p < .001) increased R^2 in a minimal (change in R^2 = .062) but significant way, F_{change} (14, 24741) = 129.38, p < .001), with age at data extraction (B=.003, p<.001), gender (B=-.123, p<.001), total strength score (B=-.009, p<.001), education/employment (B = .010, p<.001), family/marital (B = .035, p<.001), procriminal attitude/orientation (B = .017, p = .001), substance abuse (B = .009, p = .002), antisocial pattern (B = .062, p < .001), personal problems with criminogenic potential (B = .063, p < .001), history of perpetration (B = .037, p < .001), and responsivity (B = .047, p < .001) being significant factors (Table 16).

In order to assess the wisdom of using the above noted demographic and LSI-OR variables in exercising the override function, the predictor variables from the preceding multiple regressions were then applied to general recidivism as the dependent variable. As was the case in the previous analyses, the general risk/need score was applied in the first block, followed by the remaining demographic and other LSI-OR measures and the analyses were performed separately on the Aboriginal offender and Nonaboriginal offender samples. These results were most revealing in that variables that contributed incrementally, beyond the general risk/need score, to the predicted recidivism were frequently not the same as those that contributed incrementally, beyond the general risk/need score, to the use of the override and vice versa. For Aboriginal offenders, only education/employment (B=-.034, p<.001), family marital (B = -0.46, p <.001, companions (B = -.033, p =.034, substance abuse (B =-.019, p < .001), antisocial pattern (B = -.055, p = .011), and age (B = -.008, p < .001) contributed incrementally beyond the general risk/need score to the prediction of general recidivism (Table 17).

For Nonaboriginal offenders, education/employment (B = -.035, p <.001), family marital (B=-.037, p<.001), companions (B=-.021, p <.001), procriminal attitude/orientation (B = -.040, p <.001), substance abuse (B = -.032, p < .001), antisocial pattern (B = -.022, p < .001), gender-female (B = -.019, p = .011), personal problems with criminogenic potential (B = .018, p < .001), prison experience (B = .016, p = .001), strengths (B = -.004, p = .029) and age (B = -.004, p < .001) contributed incrementally beyond the general risk/need score to the prediction of recidivism (Table 18).

Discussion

This study examined the applicability of the LSI-OR on Aboriginal offenders. It did so by comparing the predictive validity of the instrument over an average follow-up of 3.8 years, on a large cohort of Ontario provincial Aboriginal offenders and compared the results to those from

the balance of the cohort, the Nonaboriginal offenders. Two measures of recidivism were employed general and violent, as well as an offense (recidivism) severity scale, developed by the ministry. The predictive validity of individual items in the context of the current investigation was also explored as was the role of structured professional judgement (SPJ) in augmenting the risk/need assessment and the occasions of its usage.

LSI-ORs Predictive Validity with Aboriginal Offenders

There were some reported differences in demographics between the Aboriginal and Nonaboriginal offenders. In this study, Aboriginal offenders were significantly younger, and had a higher proportion of females in comparison to the Nonaboriginal offenders. There was no significant difference between the Aboriginal and Nonaboriginal offenders on index offense severity. In examining the LSI-OR variables, Aboriginal offenders had a significantly higher LSI-OR total score and specific risk/needs. In addition, Nonaboriginal offenders scored higher on level of risk change, indicating that the assessors used the override feature to increase the risk level of Nonaboriginal offenders significantly more than Aboriginal offenders. In terms of recidivism, it was found that Aboriginal offenders had a higher rate of both general and violent reoffending, and they reoffended more quickly than Nonaboriginal offenders.

Despite these demographic differences, the analyses in this study have strengthened the argument that the LS family of risk assessment instruments can be used reliably and validly in the assessment of Aboriginal offenders. The high rate of general recidivism found for the Aboriginal offender sample, as well as the similar findings between the Aboriginal offender and Nonaboriginal offender samples in examining the LS and recidivism have helped to illustrate the ability of the LS in Aboriginal offender risk assessment. Alpha levels were strong for analyzing internal consistency for all offender groups. In fact, there were slightly, but consistently stronger alpha coefficients with the Aboriginal offender sample. Correlations with the LSI-OR were strongest for general recidivism, followed by violent recidivism. Sources of the LSI-OR's predictive validity for general recidivism on the complete sample and the Aboriginal offenders are reflected in the coefficients from the central eight domains. The correlations with general recidivism were higher for Nonaboriginal offenders than Aboriginal offenders on the domains of criminal history, education/employment, family/marital, leisure/recreation and companions. Aboriginal offenders had a higher correlation for procriminal attitudes. There was no difference between Aboriginal and Nonaboriginal offenders on the substance abuse or antisocial pattern subscales. However, Nonaboriginal offenders had higher correlations on all subscales for the prediction of violent recidivism.

Analyses of subgroups of Aboriginal offenders revealed similar patterns. For example, the general risk/need score correlated highly with general recidivism for both male and female Aboriginal offenders. The central eight domains and the other LSI-OR sections also predicted general recidivism well, but less so for violent recidivism. All eight domains were significant for the Aboriginal males, and only the family/marital correlation was not significant for the Aboriginal females.

Structured Professional Judgment with the LSI-OR

The effect of the override was examined by comparing the predictive validity of the initial and final risk levels. There was a consistent decrease in predictive validity across all comparisons. This included Aboriginal offenders and Nonaboriginal offenders over both outcome measures (general recidivism and violent recidivism) and in both the correlation and

ROC analyses. However, the decrement was larger for the Nonaboriginal offender sample on both measures of recidivism. In fact, in examining the 95% confidence intervals, the nonoverlapping intervals for the Nonaboriginal sample show that the decrement was significant. As the confidence intervals overlapped for the Aboriginal offenders, there was no significant difference between the original and override risk levels. Although the AUC and correlations were lower after the application of the override.

These findings triggered further investigation into the nature of the override as it was used with this sample of Aboriginal offenders. First, the pattern of initial and final risk level revealed that very few Aboriginal offenders were moved to a lower risk level, specifically 5.6% of high risk Aboriginal offenders and 7.7% of very high risk offenders. However, many Aboriginal offenders were raised to a higher risk level. This included 16.7% of very low risk offenders and 19.3% low risk offenders, 6.5% of medium risk offenders, and 1.4% of high risk offenders.

Further analyses attempted to determine possible sources or at least contributing factors to the use of the override. Because there was a strong correlation between the LSI-OR total score and use of the override (low scores were associated with increases in risk level), statistical measures were invoked to control for the LSI-OR total score, which generated some intriguing findings that may give some glimpse into how practitioners accommodate their own particular 'theories' about Aboriginal offender risk. In particular, while controlling for over all risk, education/employment and companions were negatively associated with increases in risk, substance abuse and antisocial pattern were positively associated with increases in risk. However, this pattern was even more pronounced for the Nonaboriginal offenders.

Both subsections of the Special Risk/Needs, Personal problems and History of Perpetration, were also correlated with overriding to a higher risk level, as they were with Nonaboriginal offenders. This finding is quite expected as the LSI-OR manual indicates that these factors are possible reasons for exercising the override feature. However, it was somewhat surprising that the Special Responsivity section was also positively correlated with the override function, although it was for Nonaboriginal offenders as well, as was the Social, Health and Mental Health Section. These findings were augmented by a multiple regression analysis of the LSI-OR section risk scores on the override change variable, with very comparable results, indicating that, after the total risk/need score is taken into consideration, substance abuse, antisocial pattern, personal problems, history of perpetration, and responsivity all contribute positively to assessors' decisions to increase offender risk level. In defence of this practice, one is reminded of the substantial correlations that that these sections had with recidivism. What is curious is that they were still considered to be contributing to risk even after the LSI-OR total score was determined. With respect to demographic characteristics, age and gender were unrelated to use of the override. Interestingly, for Nonaboriginal, controlling for risk, increases in risk level by means of the override was positively correlated with age and negatively related to being female.

Next, in looking into which items significant added to the prediction of recidivism, after controlling for risk, age, education/employment, family/marital, companions, substance abuse, and antisocial patterns were significant for Aboriginal offenders. These results were most revealing in that variables that contributed incrementally, beyond the general risk/need score, and independent of each other, to the use of the override were not always the same as those that contributed to the prediction of recidivism. In our view, these findings illustrate the potential

shortcomings of using structured clinical judgment to augment a statistically based risk/need assessment scheme.

There may be some special circumstances to consider when performing interviews with Aboriginal offenders. Holsinger et al. (2006) argue that extra consideration is required when interviewing Aboriginal offenders. This is important since the one-on-one interview between the offender and the assessor are crucial to the assessment process for the LS instruments. In particular, the assessor must take extra care with respect to relational expectations, communication styles, cultural heritage and customs, including jargon and dialect.

Limitations and Further Directions

Three limitations of the current investigation merit consideration. Two relate to measurement issues and two relate to inferences which may or may not be drawn from this study. First, since the LS data were derived from an existing database of the agency, it was impossible to determine the accuracy of LS as the predictor variable. Considering the fact that numerous probation officers and correctional staff with various years of service and familiarity with the LS instruments were responsible for conducting and recording the LS raw data, one can only assume there was some unknown amount of measurement error in the LS assessments. The fact that the LS data were entered into an electronic database using specially designed LS software guarantees only that no logical or arithmetic errors were made in scoring the instrument. Some offenders did have multiple assessments, sometimes by a second assessor. However, this was typically after some delay period (e.g. six months). Given the dynamic nature of LS and the agency policy that changes in offenders' circumstances should trigger a re-assessment, such a comparison would not be an accurate reflection of inter-rater reliability.

Secondly, the assessment of criminal recidivism as an outcome in the predictive analysis was based on internal agency re-contact with the cohort of offenders. This included all reconvictions in the province in which the agency was located. Consequently out of province reconvictions were not captured. The fact that Ontario covers a very large geographic area (one million square kilometres) and the majority of the population of 11.5 million resides in the central portions of the province (Attractions Canada, 2011), it is assumed that vast majority of reconvictions were captured in the agency's database. Regardless, the net effect of these two limitations in the data is to decrease the predictive validity estimates from their true value as they introduce some unknown portion of error variance into the predictor and outcome variables respectively.

Finally, the cohort was limited to provincial Aboriginal offenders meaning that Aboriginal who were sentenced to two years or more in custody were not included. As sentence length can be interpreted as a general measure of the severity of an offense (Quirk, Nutbrown & Renolds, 1991) the most serious offenders were not included. Elsewhere, in an examination of offenders generally, not simply Aboriginal offenders, we found that including both federal and provincial offenders, inmates and probationers, increased the variance of the LS scores (Wormith, Olver, Stevenson & Girard, 2007).

Conclusion

This study was undertaken to assess the appropriateness and value of using a general risk/need assessment, such as the LSI-OR, on a specialized offender population, namely Aboriginal offenders. Results from the current study have supported the use of the LS family of

instruments on Aboriginal offenders as demonstrated through the predictive validity correlations and AUC values on a large extraction of Aboriginal offenders and comparing them to the remaining Nonaboriginal offenders from the same cohort. Consequently Aboriginal offenders should not be perceived or treated as being unique from the offender population. Rather, they have many of the same criminogenic risks and needs as Nonaboriginal offender and thus, would benefit from similar risk/need assessment as Nonaboriginal offenders would.

Secondly, in examining the practice of structured professional judgement as offered to users of the LSI-OR by means of assessor override, it was revealed that the override did not improve risk prediction. In fact, it led to slight deterioration in the instrument's predictive validity. Therefore, caution, perhaps more specific guidelines for continued use, and a written justification when it is used, are all recommended. Hopefully, these results will encourage assessors to be more cognizant of the impact of their assessments and provide appropriate rationale for applying an override. In terms of next steps, additional research is recommended, especially on the override or use of professional judgment to augment statistical/empirical based prediction.

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Table 1. Comparisons of Aboriginal offenders and Nonaboriginal offenders on demographic characteristics, LSI-OR, and recidivism

	Aboriginal offender (SD)	**Nonaboriginal offenders (SD)**	**t-tests and Chi Squares**
	Mean (SD) or N (%)	Mean (SD) or N (%)	
Demographic Variables			
Age	35.71 (10.08)	38.09 (11.79)	t (2021.08) = 9.29, $p < .001$
Offense Severity	15.58 (3.74)	15.62 (4.04)	t (1965.41) = .519, *ns.*
Male	1274 (75.3%)	20342 (82.2%)	$\chi^2(1) = 50.02 = p < .001$
Female	418(24.7%)	4416 (17.8%)	
LSI-OR Variables			
General Risk/Needs	20.66 (9.62)	11.85 (8.42)	t (1871.98) = -36.74, $p < .001$
Specific Risk/Needs	4.38 (3.23)	2.36 (2.21)	t (1800.78) = -25.24, $p < .001$
Strength	0.89 (1.65)	0.89 (1.64)	t (26448) = -0.04, ns.
Initial Risk Level	3.54 (1.09)	2.49 (1.10)	t (26448) = -38.07 $p < .001$
Final Risk Level	3.55 (1.04)	2.69 (1.06)	t (23448) = -32.23, $p < .001$
Risk Level Change	0.01 (.44)	0.20 (0.59)	t (2142.35) = 16.99, $p < .001$
Recidivism Variables			
General Reoffense	57.03 (0.50)	33.08 (0.47)	t (1905.64) = -19.31, $p < .001$
Violent Reoffense	14.95 (0.36)	12.45 (0.33)	t (1894.33) = -2.81, $p = .005$
Lapse Time	1115.11 (697.93)	1415.62 (634.31)	t (1886.90) = 17.23, $p < .001$

T-test, in most cases, equal variance not assumed.

Table 2. Aboriginal offender general and violent recidivism rates by gender and disposition

	General Recidivism (%)	**Violent Recidivism (%)**
Total	57.0%	15%
Male	60.7%	14.8%
Female	45.9%	15.3%
Custodial	74.6%	22.4%
Male	75.1%	21.8%
Female	68.2%	29.5%
Conditional	48.5%	16.2%
Male	48.5%	12.9%
Female	48.5%	22.7%
Probation	47.0%	9.7%
Male	49.6%	8.6%
Female	42.2%	11.7%

Aborig. = Aboriginal

Table 3. Alpha coefficients for total LSI-OR and subcomponents for Aboriginal offenders, Nonaboriginal offenders and all offenders

Scale (number of items)	**Aboriginal-Offender (n=1692)**	**Nonaboriginal Offender (n=24758)**	**Total (n=26450)**
General Risk/Needs (43)	.92	.91	.92
General Risk/Needs (40)	.91	.90	.91
Criminal History (8)	.86	.87	.87
Education / Employment (9)	.83	.83	.84
Family / Marital (4)	.42	.38	.39
Leisure / Recreation (2)	.44	.42	.43
Companions (4)	.64	.62	.63
Procriminal Attitudes (4)	.69	.59	.60
Substance Abuse (8)	.81	.83	.84
Antisocial Pattern (4)	.60	.49	.51

Number in (brackets) indicated number of items.

Table 4. Correlations between LSI-OR total and section scores with general and violent recidivism for all offenders, Aboriginal offenders and Nonaboriginal offenders

	General Recidivism			Violent Recidivism		
LSI-OR Section	All Offenders (n=26450)	Aboriginal-Offender (n=1692)	Nonaboriginal offender (n=24758)	All Offenders (n=26450)	Aboriginal-Offender (n=1692)	Nonaboriginal offender (n=24758)
General Risk/Needs	.44***	.38***	.43***	.29***	17***	.30***
Criminal History	.42***	.35***	.41***	.28***	.22***	.29***
Education/Employment	.31***	.27***	.30***	.22***	.13**	.23***
Family/Marital	.18***	.14***	.16***	.10***	.05	.10***
Leisure/Recreation	.25***	.23***	.25***	.17***	.12***	.17***
Companions	.32***	.24***	.31***	.22***	.11***	.23***
Procriminal Attitudes	.25***	.26***	.24***	.15***	.11***	.16***
Substance Abuse	.30***	.28***	.28***	.16***	.07**	.17***
Antisocial Patterns	.34***	.32***	.32***	.23***	.16***	.23***
Total Strengths	-.12***	-.14***	-.12***	-.07***	-.07**	-.08***
Specific risk/Needs	.33***	.30***	.31***	.16***	.10***	.16***
Personal Problems	.31***	.30***	.30***	.16***	.10***	.17***
Perpetration History	.25***	.23***	.23***	.10***	.07**	.10***
Prison Experience	.28***	.25***	.28***	.21***	.16***	.22***
Social, Health, Mental Health	.19***	.17***	.17***	.13***	.09***	.13***
Barrier to Release	.23***	.25***	.21***	.16***	.10***	.17***
Responsivity	.19***	.22***	.17***	.10***	.08***	.10***

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

Table 5. Aboriginal offender correlations between LSI-OR total and section scores and recidivism by gender

	General Recidivism		Violent Recidivism	
LSI-OR Section	Male (n=1274)	Female (n=418)	Male (n=1274)	Female (n=418)
General Risk/Needs	.38***	.31***	.17***	.20***
Criminal History	.35***	.28***	.22***	.28***
Education/Employment	.27***	.24***	.14***	.12*
Family/Marital	.16***	.09	.05	.04
Leisure/Recreation	.23***	.17***	.14***	.07
Companions	.24***	.21***	.12***	.11*
Procriminal Attitudes	.28***	.14**	.11***	.10*
Substance Abuse	.27***	.25***	.05	.13**
Antisocial Patterns	.34***	.18***	.16***	.18***
Total Strengths	-.12***	-.17***	-.05	-.12*
Specific risk/Needs	.30***	.21***	.09***	.15**
Personal Problems	.30***	.22***	.10***	.15**
Perpetration History	.23***	.14**	.07*	.11*
Prison Experience	.26***	.11*	.18***	.14**
Social, Health, Mental Health	.21***	.11*	.08**	.12*
Barrier to Release	.25***	.16*	.11***	.12*
Responsivity	.24***	.06	.10***	.04

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

Table 6. Aboriginal offender correlations between LSI-OR total and section scores and recidivism by type of sentence

	General Recidivism			Violent Recidivism		
LSI-OR Section	Custody (n=603)	Conditional (n=198)	Probation (n=823)	Custody (n=603)	Conditional (n=198)	Probation (n=891)
General Risk/Needs	.33***	.28***	.26***	.06	.21**	.11***
Criminal History	.37***	.28***	.20***	.16***	.17*	.15***
Education/Employment	.24***	.12	.17***	.05	.20**	.06
Family/Marital	.09*	.14	.06	-.01	.12	.00
Leisure/Recreation	.19***	.15*	.10**	.04	.02	.07*
Companions	.17***	.19**	.17***	.04	.21**	.06
Procriminal Attitudes	.16***	.23***	.16***	.02	.05	.06
Substance Abuse	.23***	.13	.20***	-.04	.07	.03
Antisocial Patterns	.26***	.28***	.18***	.06	.20**	.10**
Total Strengths	.03	-.14	-.11**	-.03	-.09	-.03
Specific risk/Needs	.20***	.28***	.17***	-.04	.03	.06
Personal Problems	.16***	.32***	.19***	-.05	.06	.08*
Perpetration History	.19***	.12	.08*	-.01	-.02	.00
Prison Experience	.16***	.11	.07*	.10*	.06	.04
Social, Health, Mental Health	.13***	.09	.09**	.02	.10	.07*
Barrier to Release	.11**	.22**	.08*	-.02	.08	.02
Responsivity	.14***	.05	.11***	-.00	-.078	.05

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

Table 7. Correlations between LSI-OR initial and final risk level with general and violent recidivism for Aboriginal offenders

	General Recidivism		Violent Recidivism	
Sample	**Initial Risk Level**	**Final Risk Level**	**Initial Risk Level**	**Final Risk Level**
Entire Sample	.36***	.34***	.17***	.15***
Males	.35***	.34***	.17***	.16***
Females	.30***	.30***	.18***	.17***
Conditional	.30***	.31***	.19**	.14*
Sentence				
Males	.26**	.27**	.14	.09
Females	.38**	.39***	.31*	.26*
Probation	.24***	.24***	.10**	.09**
Males	.24***	.23***	.09*	.08*
Females	.23***	.25***	.12*	.11
Custody	.28***	.26***	.06	.06
Males	.28***	.27***	.07	.07
Females	.29	.18	-.12	-.10

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

Table 8. ROC coefficients for LSI-OR total and section scores with general and violent recidivism for Aboriginal offenders and Nonaboriginal offenders[1,2]

	General Recidivism			Violent Recidivism		
LSI to OR Section	Aboriginal Offender (n=1692)	Nonaboriginal offender (n=24758)	Total (n=26450)	Aboriginal Offender (n=1692)	Nonaboriginal offender (n=24758)	Total (n=26450)
General Risk/Needs	.72*** (.69 to .74)	.75*** (.75 to .76)	.76*** (.75 to .77)	.64*** (.62 to .68)	.74*** (.73 to .75)	.73*** (.72 to .74)
Criminal History	.71*** (.69 to .74)	.73*** (.73 to .74)	.74*** (.73 to .74)	.68*** (.64 to .71)	.72*** (.71 to .73)	.72*** (.71 to .73)
Education/Employment	.66*** (.63 to .68)	.68*** (.67 to .68)	.68*** (.68 to .69)	.60*** (.57 to .64)	.69*** (.68 to .70)	.68*** (.67 to .69)
Family/Marital	.58*** (.55 to .60)	.59*** (.59 to .60)	.60*** (.59 to .61)	.54*** (.50 to .58)	.58*** (.57 to .60)	.58*** (.57 to .59)
Leisure/Recreation	.63*** (.60 to .66)	.64*** (.63 to .65)	.64*** (.64 to .65)	.59*** (.56 to .63)	.64*** (.63 to .65)	.64*** (.63 to .65)
Companions	.63*** (.60 to .66)	.68*** (.67 to .68)	.68*** (.67 to .69)	.59 (.56 to .62)	.69*** (.68 to .70)	.68*** (.67 to .69)
Procriminal Attitudes	.65*** (.62 to .68)	.63*** (.62 to .64)	.63*** (.63 to .64)	.59*** (.55 to .63)	.62*** (.61 to .63)	.62*** (.61 to .63)
Substance Abuse	.66*** (.64 to .69)	.66*** (.65 to .67)	.67*** (.66 to .68)	.56*** (.52 to .59)	.63*** (.62 to .64)	.63*** (.62 to .64)
Antisocial Patterns	.68*** (.65 to .70)	.67*** (.66 to .67)	.67*** (.66 to .68)	.63*** (.59 to .66)	.66*** (.65 to .68)	.66*** (.65 to .67)
Total Strengths[3]	.58*** (.55 to .60)	.56*** (.55 to .57)	.56*** (.55 to .57)	.55*** (.51 to .58)	.56*** (.55 to .57)	.56*** (.55 to .57)
Specific risk/Needs	.68*** (.65 to .70)	.67*** (.67 to .68)	.68*** (.68 to .69)	.59*** (.55 to .63)	.62*** (.61 to .64)	.62*** (.61 to .63)
Personal Problems	.68*** (.65 to .70)	.67*** (.66 to .67)	.67*** (.67 to .68)	.59*** (.55 to .63)	.64*** (.62 to .65)	.63*** (.62 to .64)
Perpetration History	.63*** (.60 to .65)	.61*** (.60 to .62)	.62*** (.61 to .63)	.56*** (.52 to .60)	.56*** (.54 to .57)	.56*** (.55 to .57)
Prison Experience	.64*** (.61 to .66)	.62*** (.61 to .63)	.62*** (.62 to .63)	.62*** (.58 to .65)	.63*** (.62 to .64)	.63*** (.62 to .64)
Social, Health, Mental Health	.60*** (.57 to .62)	.60*** (.60 to .61)	.61*** (.60 to .62)	.58*** (.54 to .62)	.62*** (.60 to .63)	.61*** (.60 to .62)
Barrier to Release	.61*** (.58 to .64)	.56*** (.55 to .57)	.57*** (.56 to .58)	.56*** (.52 to .60)	.57*** (.56 to .58)	.57*** (.56 to .58)
Responsivity	.63*** (.60 to .65)	.60*** (.59 to .60)	.60*** (.60 to .61)	.57*** (.53 to .60)	.58*** (.56 to .59)	.58*** (.57 to .59)

[1] All *p*'s < .001.[2] Confidence intervals are in brackets; [3] The coding of recidivism was reversed for Total Strengths in order to predict success as opposed to recidivism.

Table 9. Mean survival time (days), standard error, and 95% confidence interval for general recidivism presented by initial and final risk level for Aboriginal offenders and Nonaboriginal offenders

	Mean survival time	Standard Error	95% confidence Interval
Aboriginal offenders (N = 1692)			
Initial Risk Level			
Very Low	1631.903	53.204	1527.62 to 1736.18
Low	1468.345	40.224	1389.51 to 1547.18
Medium	1296.413	27.316	1242.88 to 1349.95
High	1044.272	30.390	984.71 to 1103.84
Very High	666.857	32.752	602.66 to 731.05
	1115.105	16.962	1081.86 to 1148.35
Final Risk Level			
Very Low	1632.443	57.243	1520.25 to 1744.64
Low	1466.166	44.015	1379.90 to 1552.44
Medium	1288.788	26.418	1237.01 to 1340.57
High	1050.567	30.286	991.21 to 1109.93
Very High	666.733	33.290	601.48 to 731.98
	1115.105	16.962	1081.86 to 1148.35
Nonaboriginal offenders (N = 24758)			
Initial Risk Level			
Very Low	1698.966	5.300	1688.58 to 1709.35
Low	1586.019	5.786	1574.68 to 1597.36
Medium	1348.322	7.563	1333.50 to 1363.15
High	996.035	12.058	972.40 to 1019.67
Very High	612.901	19.815	574.06 to 651.74
Final Risk Level			
Very Low	1694.383	6.158	1682.31 to 1706.45
Low	1587.515	6.590	1574.60 to 1600.43
Medium	1416.758	6.323	1404.37 to 1429.15
High	1090.798	11.055	1069.13 to 1112.47
Very High	679.719	21.099	638.36 to 721.07

Table 10. Mean survival time (days), standard error, and 95% confidence interval for violent recidivism presented by initial and final risk level for Aboriginal offenders and Nonaboriginal offenders

	Mean survival time	Standard Error	95% confidence Interval
Aboriginal offenders (N = 1692)			
Initial Risk Level			
Very Low	1800.056	24.771	1751.50 to 1848.61
Low	1746.688	22.679	1702.24 to 1791.14
Medium	1665.536	19.153	1629.00 to 1703.08
High	1558.774	26.330	1507.17 to 1610.38
Very High	1333.070	44.112	1246.61 to 1419.53
Final Risk Level			
Very Low	1795.557	29.200	1738.32 to 1852.79
Low	1737.299	26.143	1686.06 to 1788.54
Medium	1658.647	18.774	1621.85 to 1695.44
High	1572.687	25.638	1522.44 to 1622.94
Very High	1332.930	45.141	1244.45 to 1421.41
Nonaboriginal offenders (N = 24758)			
Initial Risk Level			
Very Low	1782.797	3.226	1776.47 to 1789.12
Low	1745.952	3.640	1738.82 to 1753.09
Medium	1637.241	5.752	1625.97 to 1648.51
High	1380.959	12.195	1357.06 to 1404.86
Very High	1016.432	27.576	962.38 to 1070.48
Final Risk Level			
Very Low	1777.676	3.893	1770.05 to 1785.30
Low	1738.735	4.327	1730.25 to 1747.22
Medium	1668.432	4.610	1659.40 to 1677.47
High	1455.285	10.370	1434.96 to 1475.61
Very High	1102.648	27.341	1049.06 to 1156.24

Table 11. Summary of survival analyses initial and final risk levels (Log Rank (Mantel-Cox) overall and pairwise comparisons) for Aboriginal offenders on general and violent recidivism

	Aboriginal Offender (n=1692)		Nonaboriginal offender (n=24758)	
	Initial Risk	Final Risk	Initial Risk	Final Risk
General Recidivism				
Overall [1]	272.68***	254.52***	5184.24***	3557.53***
VL vs. L	5.75*	4.47*	212.83***	150.35***
VL vs. M	18.77**	16.47***	1221.30***	690.81***
VL vs. H	41.50***	34.53***	3032.46***	1922.74***
VL vs. VH	84.78***	73.52***	4490.69***	3176.59***
L vs. M	11.05***	11.34***	631.54***	301.81***
L vs. H	51.64***	49.94***	2369.76***	1510.16***
L vs. VH	145.89***	129.87***	3541.97***	2593.41***
M vs. H	35.43***	32.94***	662.15***	731.92***
M vs. VH	188.76***	190.66***	1466.31***	1577.39***
H vs. VH	63.67***	65.88***	274.42***	309.47***
Violent Recidivism				
Overall[1]	97.30***	85.06***	2773.33***	1781.09***
VL vs. L	2.72	2.29	61.13***	48.94***
VL vs. M	8.73**	7.38 **	432.11***	224.00***
VL vs. H	16.08***	12.55***	1473.38***	865.10***
VL vs. VH	27.52***	23.20***	2580.45***	1675.41***
L vs. M	6.94**	5.83*	257.86***	97.29***
L vs. H	21.91***	18.19***	1366.46***	766.59***
L vs. VH	49.76***	41.57***	2458.63***	1575.72***
M vs. H	11.58***	8.56**	470.46***	478.54***
M vs. VH	59.25***	58.38***	1117.92***	1119.88***
H vs. VH	19.48***	21.96***	187.96***	198.91***

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

L = Very Low; L = Low; M = Medium; H = High; VH = Very High; vs. = versus

[1] Log Rank (Mantel-Cox) Linear trend: Chi-Square (1). Vector of trend weights is -2, -1, 0, 1, 2.

Table 12. Pearson correlations and ROCs for original and final (override) risk levels for general and violent recidivism on the Aboriginal offender and Nonaboriginal offender samples

	General Recidivism		Violent Recidivism	
Risk Level	Aboriginal Offender (n=1692)	Nonaboriginal offender (n=24758)	Aboriginal Offender (n=1692)	Nonaboriginal offender (n=24758)
Correlation				
Original	.36***	.41***	.17***	.28***
Final	.34***	.35***	.15***	.23***
Area Under Curve				
Original	.70 *** (CI: .67-.72)	.74 *** (CI: .74-.75)	.63 *** (CI: .59-.66)	.72 *** (CI: .72 - .74)
Final	.69 *** (CI: .67-.72)	.70 *** (CI: .70-.71)	.62 *** (CI: .58 - .65)	.69 *** (CI: .68 - .70)

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

Table 13. Distribution of Aboriginal offenders Placement by Initial and Final (after override) Risk Level and Within Cell Recidivism Rate

		Final Risk Level					
		Very Low	**Low**	**Medium**	**High**	**Very High**	**Total**
Initial Risk Level	**Very Low**	60 18.3%	2 0%	10 20.0%	0 n/a	0 n/a	72 (4.3%) 18.1%
	Low	0 n/a	159 34.6%	28 25.0%	9 33.3%	1 100.0%	197 (11.6%) 33.5%
	Med.	0 n/a	8 0%	499 47.9%	33 45.5%	2 100.0%	542 (32.0%) 47.2%
	High	1 0%	0 n/a	27 51.9%	468 65.0%	7 42.9%	503 (29.7%) 63.8%
	Very High	0 n/a	0 n/a	29 69.0%	0 n/a	349 82.8%	378 (22.3%) 81.7%
	Total	61(3.6%) 18.0%	169(10.0%) 32.5%	593(35.0%) 47.6%	510(30.1%) 63.1%	359(21.2%) 82.2%	1692 (100.0%) 57.0%

Med. = Medium; na = not applicable.

Note. Cell percents represent within cell recidivism rates. Bracketed row and column percents represent percent of Aboriginal offenders in the respective initial and final (override) risk level categories. Unbracketed row and column percents represent recidivism rates in the respective initial and final (override) risk level categories.

Table 14. Partial correlation matrix with LSI-OR section scores and override score controlling for total general risk/needs score (Section A) on the complete sample, Aboriginal offenders, and Nonaboriginal offenders

LSI-OR section	Aboriginal offenders (n=1689)	Nonaboriginal offenders (n=24754)	Total (n=26446)
Total Section A[1]	-.28***	-.30***	-.31***
Age	.01	.10***	.10***
Gender (Female)	-.05*	-.10***	-.10***
Total Strengths	-.04	-.03***	-.03***
Criminal History	.02	-.00	-.00
Education/Employment	-.08***	-.06***	-.06***
Family/Marital	.02	.06***	.06***
Leisure/Recreation	-.01	.01	.01
Companions	-.07**	-.07***	-.07***
Procriminal Attitudes	.02	.10***	.10***
Substance Abuse	.06*	-.02***	-.02***
Antisocial Patterns	.06*	.09***	.09***
Total Section B	.18***	.20***	.20***
Personal Problems	.18***	.19***	.19***
Perpetration History	.11***	.12***	.12***
Prison Experience	.08***	.06***	.06***
Social, Health, Mental Health	.05*	.04***	.04***
Special Responsivity	.14***	.15***	.15***

- $p < .05$, ** $p < .01$, *** $p < .001$

Note:

[1] Zero order correlation for the control variable (Total Section A) with outcome (Override score)

Table 15. Multiple Regression of LSI-OR sections on Risk Level Change Score (Final Risk Level minus Initial Risk Level) for Aboriginal offenders

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero order	Partial	Part
Step 1										
(Constant)	.275	.024		11.381	.000	.228	.322			
Total LSI-OR Score	-.013	.001	-.281	-12.041	.000	-.015	-.011	-.281	-.281	-.281
Step 2										
(Constant)	.405	.063		6.403	.000	.281	.528			
Total LSI-OR Score	-.030	.006	-.664	-5.203	.000	-.041	-.019	-.281	-.126	-.119
Age At Data Extraction	-.001	.001	-.018	-.703	.482	-.003	.001	.050	-.017	-.016
Gender	-.030	.026	-.030	-1.175	.240	-.081	.020	.014	-.029	-.027
Total Strength Score	-.009	.006	-.034	-1.398	.162	-.022	.004	.044	-.034	-.032
Education Employment	.001	.008	.003	.068	.946	-.015	.016	-.264	.002	.002
Family Marital	.015	.012	.040	1.262	.207	-.008	.037	-.135	.031	.029
Companions	-.018	.014	-.042	-1.257	.209	-.046	.010	-.234	-.031	-.029
Procriminal Attitude/Orientation	-.015	.013	-.046	-1.147	.252	-.040	.011	-.187	-.028	-.026
Substance Abuse	.023	.008	.125	2.737	.006	.007	.040	-.171	.067	.062
Antisocial Pattern	.043	.020	.113	2.199	.028	.005	.082	-.204	.054	.050
Personal Problems with Criminogenic Potential	.034	.008	.163	4.195	.000	.018	.050	-.078	.102	.096
History of Perpetration	.020	.009	.068	2.094	.036	.001	.038	-.081	.051	.048
Prison Experience	.000	.014	.000	.001	.999	-.027	.027	-.101	.000	.000
Social Health and Mental Health	-.001	.005	-.005	-.172	.864	-.010	.009	-.101	-.004	-.004
Special Responsivity considerations	.035	.011	.103	3.165	.002	.013	.057	-.055	.077	.072

Table 16. Multiple Regression of LSI-OR sections on Risk Level Change Score (Final Risk Level minus Initial Risk Level) for Nonaboriginal offenders

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
Step 1										
(Constant)	.456	.006		73.453	.000	.444	.468			
Total LSI-OR Score	-.021	.000	-.303	-50.048	.000	-.022	-.021	-.303	-.303	-.303
Step 2										
(Constant)	.464	.018		25.119	.000	.428	.500			
Total LSI-OR Score	-.046	.002	-.651	-22.545	.000	-.050	-.042	-.303	-.142	-.132
Age At Data Extraction	.003	.000	.068	10.506	.000	.003	.004	.116	.067	.061
Gender	-.123	.010	-.079	-12.688	.000	-.142	-.104	-.067	-.080	-.074
Total Strength Score	-.009	.002	-.024	-3.931	.000	-.013	-.004	.047	-.025	-.023
Education Employment	.010	.003	.046	3.658	.000	.005	.016	-.264	.023	.021
Family Marital	.035	.004	.064	8.123	.000	.026	.043	-.095	.052	.048
Companions	-.005	.005	-.009	-1.020	.308	-.015	.005	-.246	-.006	-.006
Procriminal Attitude/Orientation	.017	.005	.031	3.198	.001	.007	.028	-.110	.020	.019
Substance Abuse	.009	.003	.036	3.142	.002	.004	.015	-.226	.020	.018
Antisocial Pattern	.062	.008	.087	7.833	.000	.046	.077	-.175	.050	.046
Personal Problems with Criminogenic Potential	.063	.003	.162	19.167	.000	.056	.069	-.045	.121	.112
History of Perpetration	.037	.004	.063	8.420	.000	.028	.045	-.058	.053	.049
Prison Experience	.006	.006	.008	1.052	.293	-.006	.019	-.124	.007	.006
Social Health and Mental Health	.000	.002	.001	.069	.945	-.004	.004	-.109	.000	.000
Special Responsivity considerations	.047	.005	.072	9.673	.000	.037	.056	-.007	.061	.057

Table 17. Multiple Regression of LSI-OR sections on general recidivism for Aboriginal offenders

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
Step 1										
(Constant)	.170	.026		6.423	.000	.118	.222			
Total LSI-OR Score	.019	.001	.377	16.720	.000	.017	.022	.377	.377	.377
Step 2										
(Constant)	.547	.069		7.889	.000	.411	.683			
Total LSI-OR Score	.039	.006	.768	6.217	.000	.027	.052	.377	.150	.137
Age At Data Extraction	-.008	.001	-.172	-7.010	.000	-.011	-.006	-.191	-.169	-.155
Gender	-.017	.028	-.015	-.616	.538	-.073	.038	-.128	-.015	-.014
Total Strength Score	-.011	.007	-.036	-1.521	.128	-.025	.003	-.139	-.037	-.034
Education Employment	-.034	.009	-.197	-3.989	.000	-.051	-.018	.268	-.097	-.088
Family Marital	-.046	.013	-.111	-3.639	.000	-.071	-.021	.135	-.089	-.080
Companions	-.033	.016	-.068	-2.123	.034	-.064	-.003	.240	-.052	-.047
Procriminal Attitude/Orientation	-.019	.014	-.052	-1.350	.177	-.047	.009	.264	-.033	-.030
Substance Abuse	-.019	.009	-.092	-2.091	.037	-.038	-.001	.280	-.051	-.046
Antisocial Pattern	-.055	.022	-.126	-2.549	.011	-.097	-.013	.318	-.062	-.056
Personal Problems with Criminogenic Potential	.017	.009	.071	1.880	.060	-.001	.034	.298	.046	.042
History of Perpetration	.002	.010	.005	.157	.875	-.019	.022	.229	.004	.003
Prison Experience	.004	.015	.008	.278	.781	-.025	.034	.251	.007	.006
Social Health and Mental Health	.000	.005	.002	.061	.951	-.010	.011	.171	.001	.001
Special Responsivity considerations	-.012	.012	-.030	-.966	.334	-.035	.012	.221	-.024	-.021

Table 18. Multiple Regression of LSI-OR sections on general recidivism for Nonaboriginal offenders

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Correlations		
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Zero-order	Partial	Part
Step 1										
(Constant)	.046	.005		9.781	.000	.036	.055			
Total LSI-OR Score	.024	.000	.431	75.083	.000	.023	.025	.431	.431	.431
Step 2										
(Constant)	.242	.014		17.165	.000	.215	.270			
Total LSI-OR Score	.046	.002	.822	29.518	.000	.043	.049	.431	.184	.166
Age At Data Extraction	-.004	.000	-.106	-16.931	.000	-.005	-.004	-.132	-.107	-.095
Gender	-.019	.007	-.015	-2.546	.011	-.033	-.004	-.076	-.016	-.014
Total Strength Score	-.004	.002	-.013	-2.181	.029	-.007	.000	-.117	-.014	-.012
Education Employment	-.035	.002	-.195	-15.913	.000	-.039	-.031	.297	-.101	-.090
Family Marital	-.037	.003	-.084	-11.157	.000	-.043	-.030	.161	-.071	-.063
Companions	-.021	.004	-.045	-5.294	.000	-.029	-.013	.308	-.034	-.030
Procriminal Attitude/Orientation	-.040	.004	-.091	-9.641	.000	-.048	-.032	.239	-.061	-.054
Substance Abuse	-.032	.002	-.155	-14.022	.000	-.036	-.027	.279	-.089	-.079
Antisocial Pattern	-.042	.006	-.076	-7.012	.000	-.054	-.030	.325	-.045	-.040
Personal Problems with Criminogenic Potential	.018	.003	.058	7.144	.000	.013	.023	.298	.045	.040
History of Perpetration	-.005	.003	-.010	-1.433	.152	-.011	.002	.230	-.009	-.008
Prison Experience	.016	.005	.024	3.379	.001	.007	.025	.277	.021	.019
Social Health and Mental Health	-.002	.002	-.011	-1.483	.138	-.006	.001	.172	-.009	-.008
Special Responsivity considerations	-.006	.004	-.012	-1.679	.093	-.013	.001	.168	-.011	-.009

Figure 1. Survival curves for Aboriginal offenders' general recidivism by initial risk level

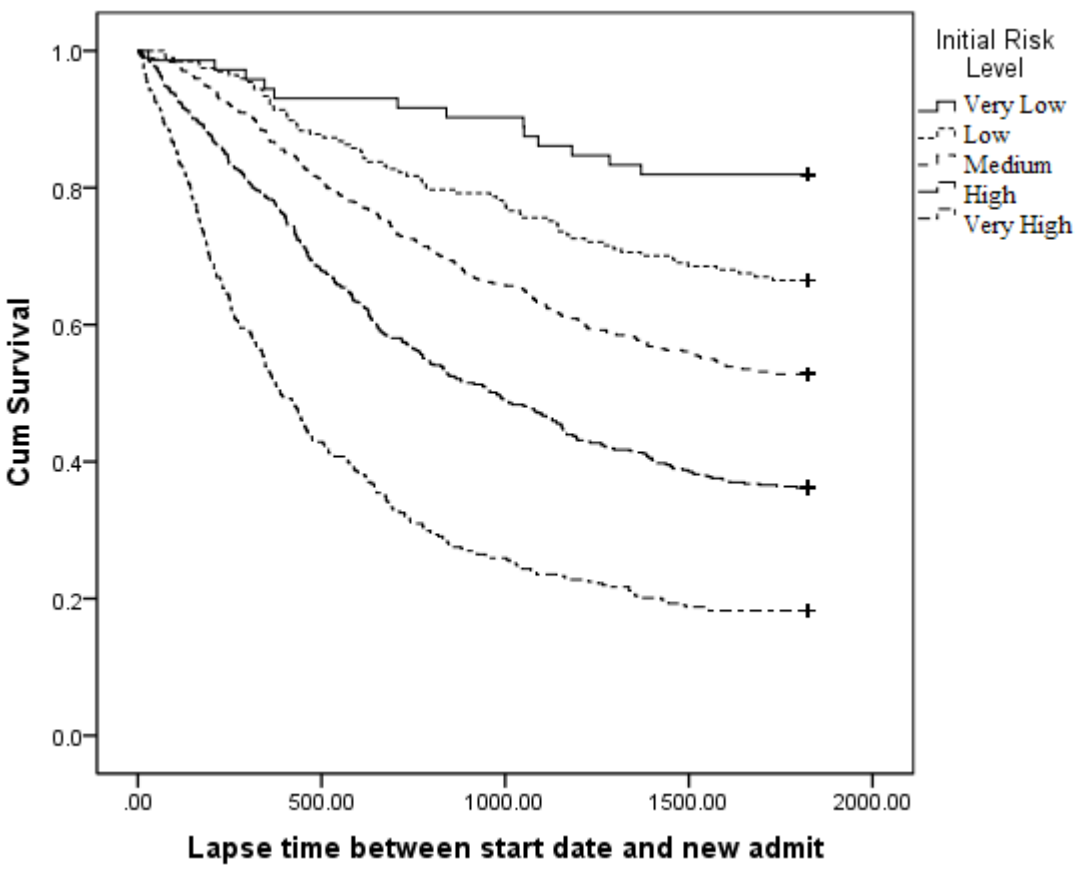


Figure 2. Survival curves for Aboriginal offenders' general recidivism by final risk level

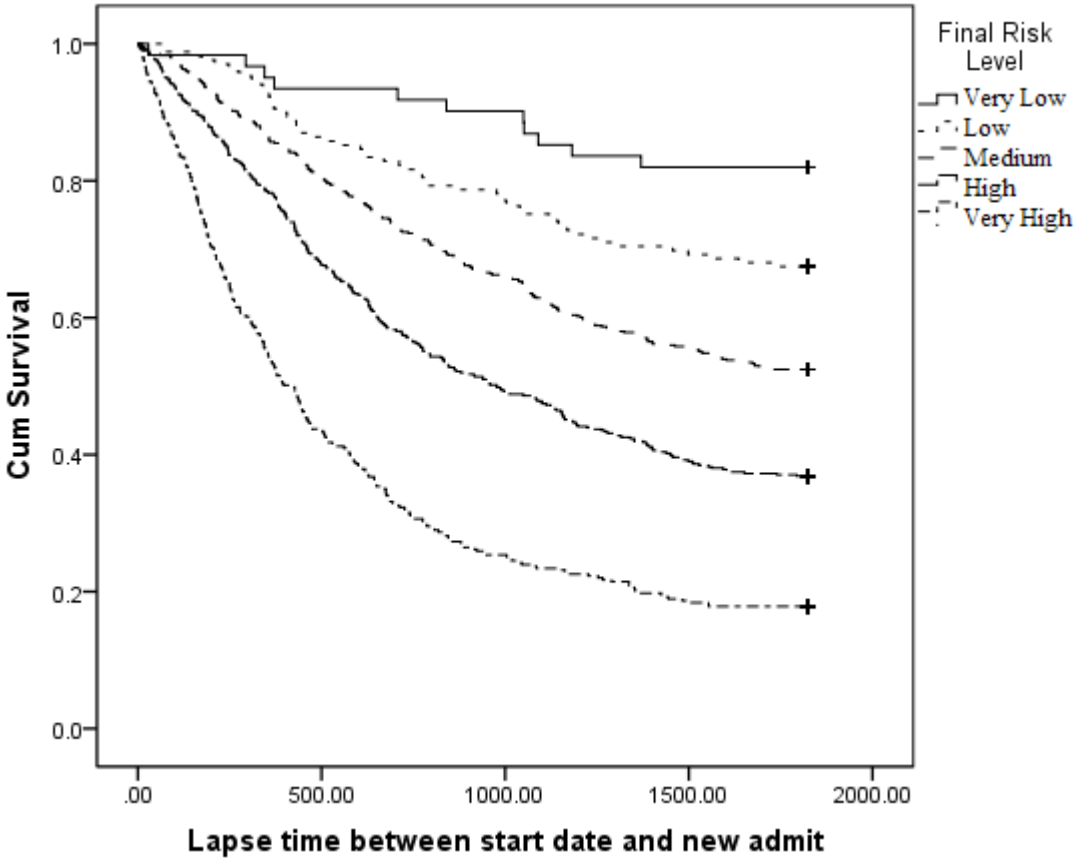


Figure 3. Survival curves for Nonaboriginal offenders' general recidivism by initial risk level

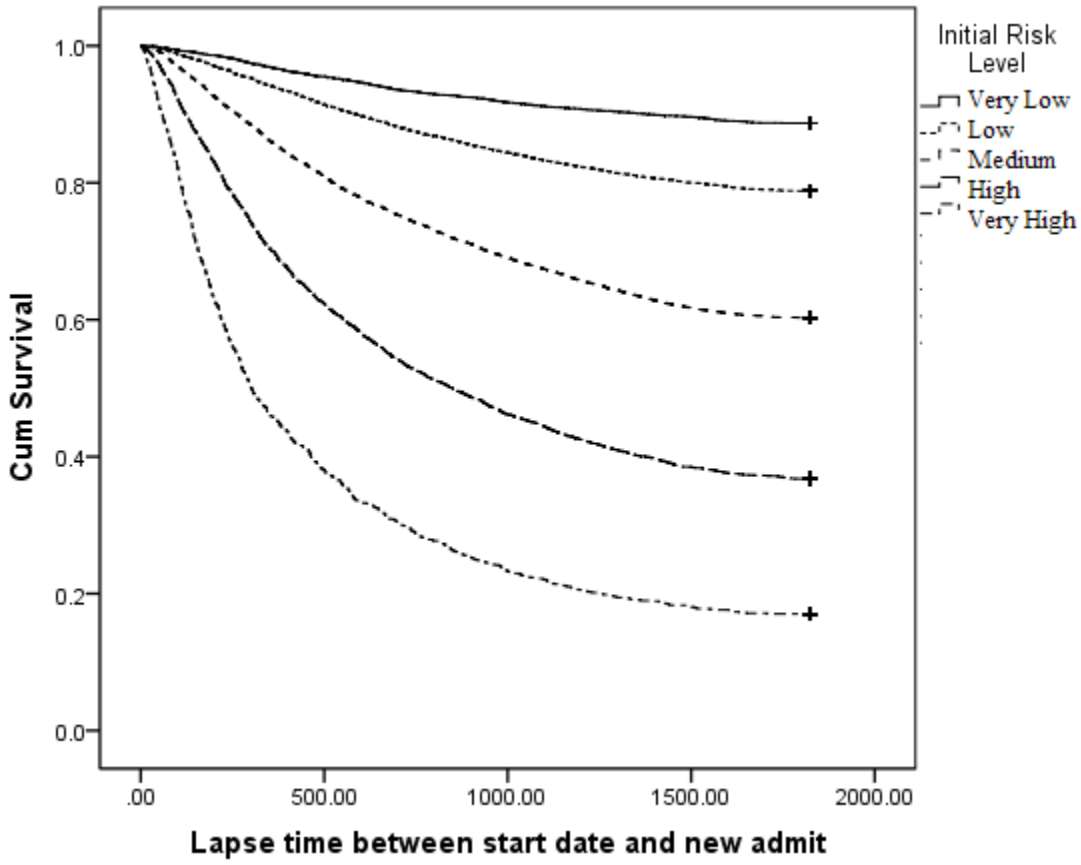


Figure 4. Survival curves for Nonaboriginal offenders' general recidivism by final risk level

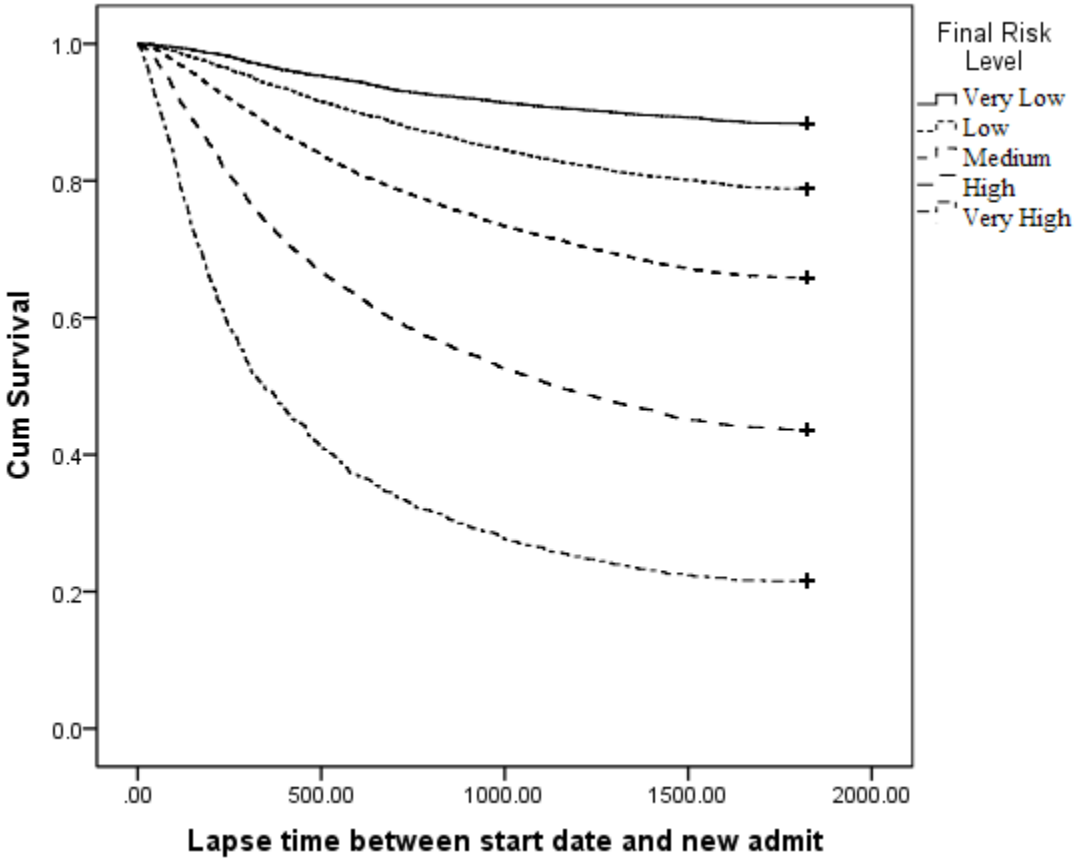


Figure 5. Survival curves for Aboriginal offenders' violent recidivism by initial risk level

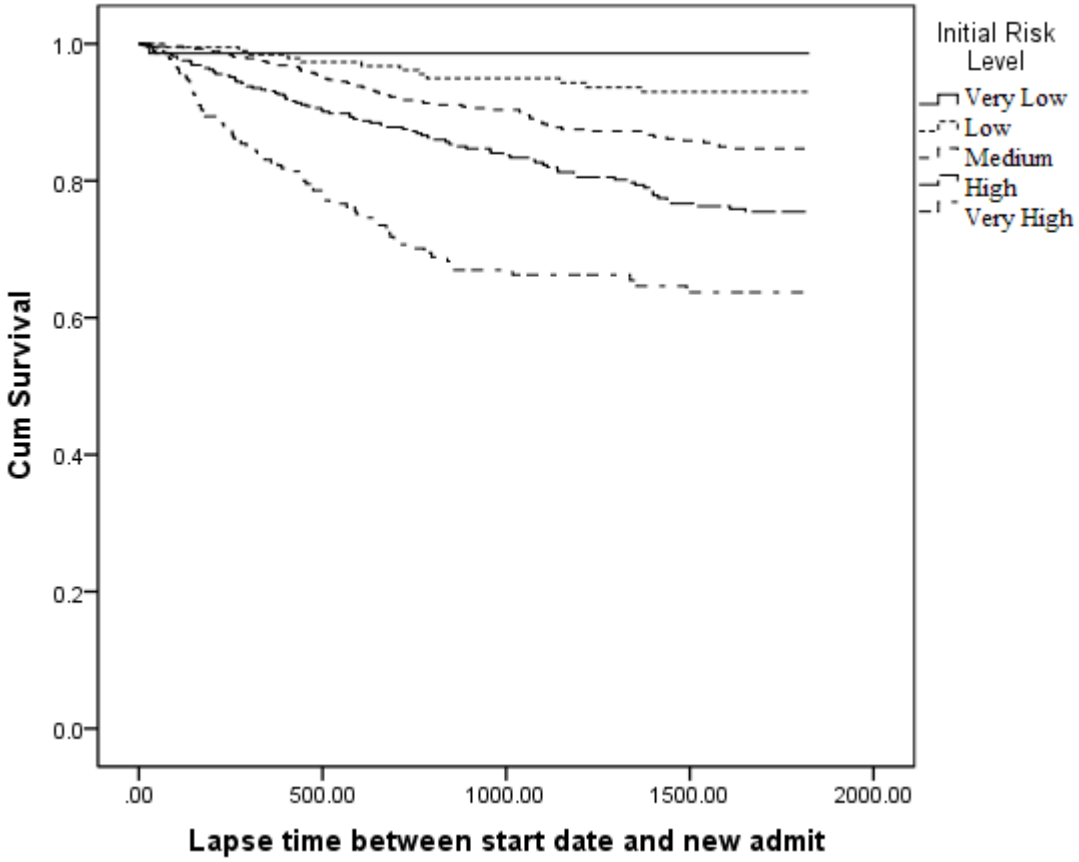


Figure 6. Survival curves for Aboriginal offenders' violent recidivism by final risk level

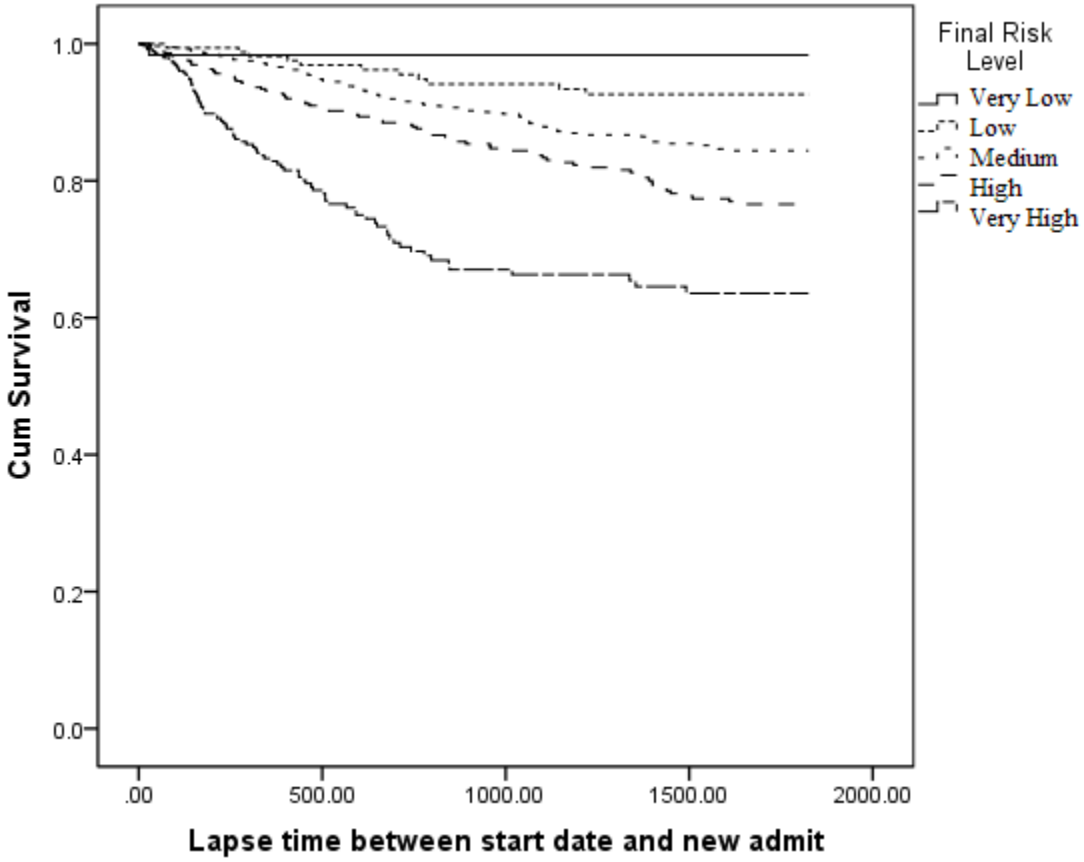


Figure 7. Survival curves for Nonaboriginal offenders' violent recidivism by initial risk level

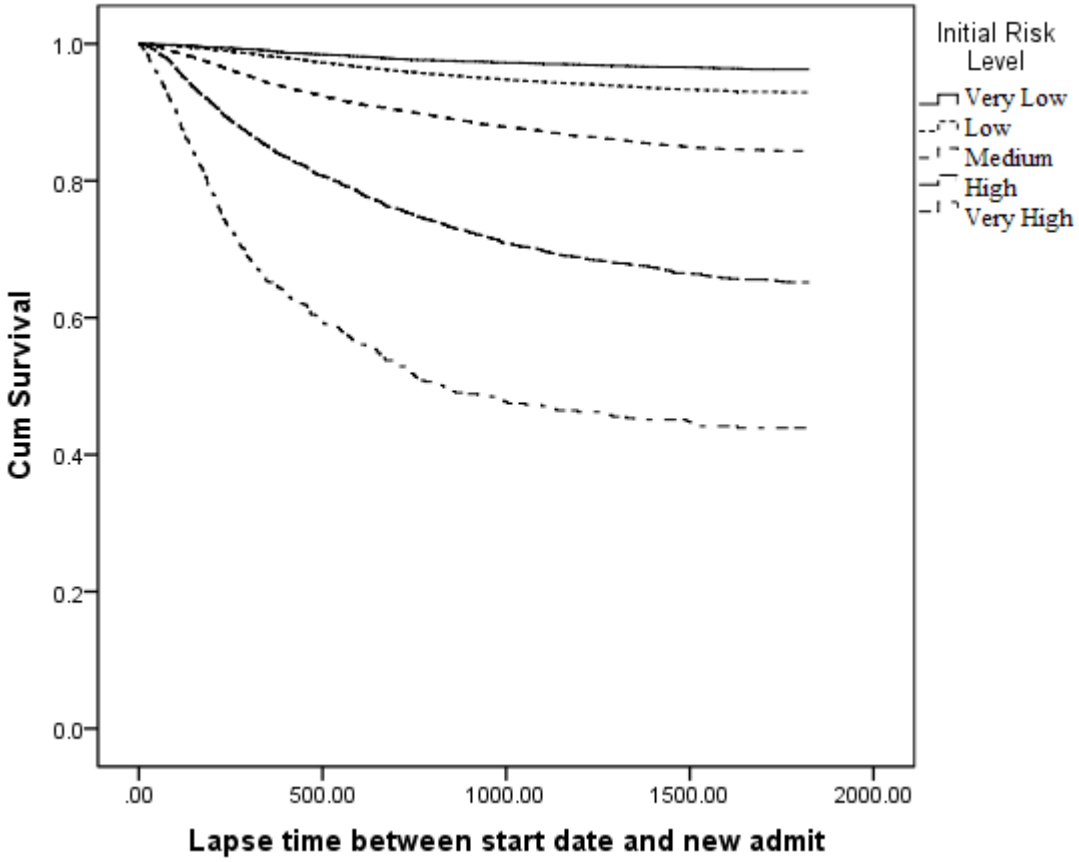
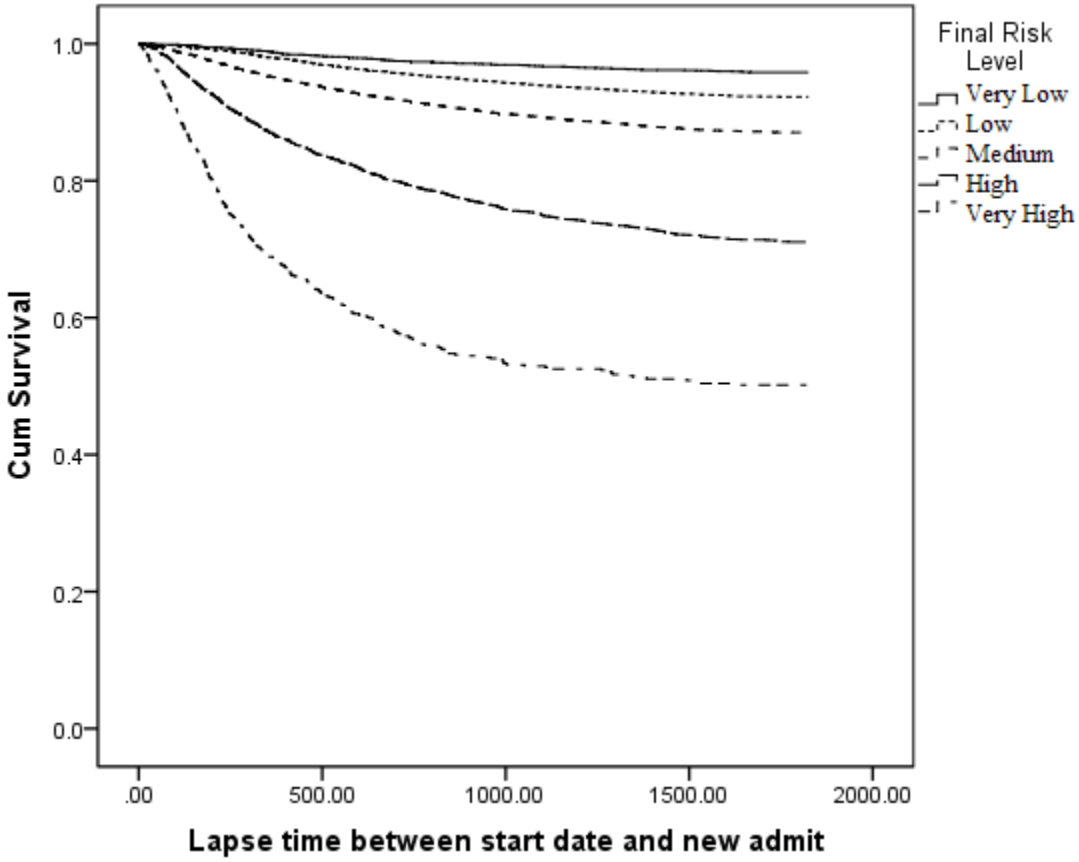


Figure 8. Survival curves for Nonaboriginal offenders' violent recidivism by final risk level



Appendix A

Modified Ontario Offense Severity Scale

Offence Severity	Offence Type
0	Nonrecidivist
1	Municipal Bylaw Offences
2	Other Provincial Offences
3	Liquor Licence Act Offences
4	Highway Traffic Act Offences
5	Parole Violations
6	Other Federal Statute Offences
7	Misc. Offences against Public Order
8	Drinking & Driving Offences
9	Breach of Court Order / Escape
10	Criminal Code Traffic Offences
11	Drug Possession Offences
12	Obstruction of Justice Offences
13	Morals & Gaming Offences
14	Arson/Property Damage Offences
15	Assault & Related Offences
16	Theft/Possession Offences
17	Misc. Offences against the Person
18	Fraud & Related Offences
19	Weapons Offences
20	Traffic/Import Drug Offences
21	Non-Violent Sexual Offences
22	Break & Enter & Related Offences
23	Violent Sexual Offences
24	Serious violent Offences
25	Homicide & Related Offences

N.B. Unknown offenses were coded as missing data

Appendix B

Table 1. LSI-OR General Risk/Need Item Correlations with General and Violent Recidivism as well as the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item 1	.21***	.28***	.13***	.18***	.01	-.02**
Item 2	.22***	.32***	.16***	.21***	.02	-.02**
Item 3	.24***	.33***	.15***	.22***	-.02	-.00
Item 4	.22***	.25***	.15***	.20***	.00	.02*
Item 5	.28***	.22***	.16***	.17***	.02	-.01
Item 6	.26***	.32***	.15***	.22***	-.02	.00
Item 7	.23***	.28***	.14***	.23***	.06*	.03***
Item 8	.33***	.35***	.18***	.25***	.02	.01
Item 9	.20***	.20***	.12***	.17***	-.07**	-.04***
Item 10	.20***	.23***	.11***	.19***	-.01	-.01*
Item 11	.12***	.15***	.04	.12***	-.02	-.02***
Item 12	.08***	.10***	-.02	.06***	.02	.01
Item 13	.13***	.17***	.03	.11***	-.02	-.04***
Item 14	.16***	.20***	.11***	.12***	-.05*	-.05***
Item 15	.21***	.22***	.12***	.18***	-.07**	-.04***
Item 16	.21***	.22***	.13***	.18***	-.08***	-.04***
Item 17	.22***	.22***	.12***	.18**	-.08***	-.04***
Item 18	.03	.03***	-.06*	-.01*	.02	.12***
Item 19	.09***	.12***	.06*	.08***	.02	.02***
Item 20	.06*	.10***	.05*	.07***	.03	.02***

	General Recidivism		Violent Recidivism		Override Score	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item 21	.15***	.15***	.06**	.11***	-.02	-.04***
Item 22	.15***	.14***	.08***	.10***	.01	.01
Item 23	.22***	.25***	.11***	.17***	-.03	.005
Item 24	.21***	.26***	.10***	.19***	-.05*	-.09***
Item 25	.24***	.28***	.14***	.21***	-.04	-.05***
Item 26	.08***	.10***	.02	.09***	-.06*	.02*
Item 27	.11***	.14***	.03	.12***	-.02	.01
Item 28	.20***	.23***	.10***	.18***	.02	.06***
Item 29	.27***	.23***	.13***	.16***	.01	.05***
Item 30	.13***	.06***	.03	.01*	.04	.08***
Item 31	.16***	.14***	.04	.07***	-.03	.05***
Item 32	.15***	.16***	.01	.05***	.02	-.02**
Item 33	.18***	.26***	.08***	.19***	.02	-.04***
Item 34	.18***	.12***	-.02	.00	.02	-.011
Item 35	.18***	.25***	.11***	.23***	.03	-.012
Item 36	.20***	.20***	.05*	.12***	.01	-.03***
Item 37	.20***	.20***	.00	.11***	.03	.02*
Item 38	.20***	.21***	.08***	.16***	.01	-.004
Item 39	.14***	.10***	.03	.08***	.09***	.004
Item 40	.11***	.05***	.04	.03***	.07**	.06***
Item 41	.27***	.23***	.15***	.18***	.03	.00
Item 42	.24***	.24***	.11***	.16***	.04	.08***

	General Recidivism		Violent Recidivism		Override Score	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item 43	.21***	.25***	.11***	.19***	-.00	.03***
Mean Item Correlation	**0.18**	**0.20**	**0.08**	**0.14**	**-0.00**	**0.00**

Table 2. LSI-OR Specific Risk/Need Item Correlations with General and Violent Recidivism as well as the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item B1.1	.27***	.29***	.15***	.21***	.01	.03***
Item B1.2	.[a]	.00	.[a]	.01	.	.01*
Item B1.3	.02	.01*	.04	-.01	.02	.03***
Item B1.4	.07**	.06***	.01	.04***	.11***	.02**
Item B1.5	.24***	.18***	.13***	.12***	.01	.07***
Item B1.6	.16***	.11***	-.01	-.00	.11***	.13***
Item B1.7	.11***	.06***	-.03	-.02**	.11***	.13***
Item B1.8	.06*	.01	.01	-.02**	.15***	.21***
Item B1.9	.15***	.11***	.03	.08***	.10***	.06***
Item B1.10	.05*	.04***	.02	.02**	.07**	.02***
Item B1.11	.10***	.03***	-.00	-.00	.09***	.04***
Item B1.12	.15***	.19***	.05*	.16***	.01	-.02*
Item B1.13	.10***	.21***	.07**	.15***	.06*	.03***
Item B1.14	.06*	.06***	.08***	.04***	.04	.03***
Item B2.1	.06**	.04***	.02	.01	.06*	.14***
Item B2.2	.00	-.01*	-.00	-.02***	.10***	.11***
Item B2.3	.20***	.18***	.10***	.10***	.07**	.01
Item B2.4	.07***	.03***	-.10***	-.05***	.10***	.13***
Item B2.5	.17***	.15***	.05*	.09***	.04	.02**
Item B2.6	.16***	.15***	.07**	.09***	.07**	.04***
Item B2.7	.07**	.04***	.09***	.03***	.04	.01
Item B2.8	.16***	.19***	.14***	.18***	-.04	.02**

	General Recidivism		Violent Recidivism		Override Score	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item B2.9	-.01	.07***	-.00	-.01*	-.03	-.02
Mean Item Correlation	**0.11**	**0.10**	**0.04**	**0.05**	**0.06**	**0.05**

Table 3. LSI-OR Prison Experience Item Correlations with General and Violent Recidivism as well as the Override Score

	General Recidivism		**Violent Recidivism**		**Override Score**	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item C.1	.13***	.12***	.10***	.10***	.01	.03***
Item C.2	.22***	.23***	.11***	.19***	.02	.02**
Item C.3	.01	.04***	-.02	.02**	-.01	-.02*
Item C.4	.11***	.12***	.05*	.09***	.07**	.04***
Item C.5	.08***	.06***	.07**	.04***	.07**	.03***
Item C.6	.12***	.15***	.10***	.11***	.05*	.02**
Item C.7	.08***	.07***	.05*	.04***	.06**	.02**
Item C.8	.12***	.15***	.11***	.12***	.01	.04***
Item C.9	.04	.11***	.03	.11***	-.03	.02**
Mean Item Correlation	**0.10**	**0.12**	**0.07**	**0.09**	**0.03**	**0.02**

Table 4. LSI-OR Social, Health and Mental Health Item Correlations with General and Violent Recidivism and the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item F1.1	.14***	.15***	.07**	.14***	.01	.01
Item F1.2	.08**	.12***	.10***	.10***	-.02	.02**
Item F1.3	.11***	.14***	.11***	.11***	.04	.02***
Item F1.4	.02	.02***	.06**	.03***	.03	.01
Item F1.5	.00	.01*	-.01	.01*	.04	.02*
Item F1.6	.03	-.00	.02	.00	-.03	-.01
Item F1.7	.06**	.09***	.02	.08***	-.02	.04***
Item F1.8	.03	.01	.02	.00	-.03	.02**
Item F1.9	.04	.01**	.02	-.00	-.02	.04***
Item F1.10	.10***	.07***	.03	.04***	.05	.02***
Item F1.11	.04	.10***	.05	.05***	.01	.01
Item F1.12	.02	.02***	-.00	.02**	.03	.02***
Item F1.13	-.00	-.02**	-.01	.00	.00	.04***
Item F1.14	.12***	.10***	.04	.06***	.02	.00
Item F1.15	.11***	.08***	.03	.05***	.06**	-.00
Item F1.16	.04	.06***	.04	.06***	.00	.01
Item F1.17	.08***	.08***	.06**	.06***	.03	.00
Item F1.18	.15***	.09***	.06*	.06***	.04	.00
Item F1.19	.06**	.04***	.02	.03***	.08*	.01*
Item F2.1	.25***	.21***	.10***	.17***	.01	.03***
Mean Item Correlation	**0.07**	**0.07**	**0.04**	**0.05**	**0.02**	**0.02**

Table 5. LSI-OR Special Responsivity Considerations Item Correlations with General and Violent Recidivism and the Override Score

	General Recidivism		**Violent Recidivism**		**Override Score**	
	Abor. Offenders (n=1,692)	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**	**Abor. Offenders (n=1,692)**	**Nonabor. Offenders (n=24,758)**
Item G1.1	.20***	.21***	.20***	.14***	.11***	.06***
Item G1.2	.14***	.12***	.05*	.05***	.07*	.14***
Item G1.3	.08***	.05***	.03	.02**	.11***	.04***
Item G1.4	.13***	-.03***	.01	-.02*	.08*	.07***
Item G1.5	.03	-.01	.01	-.01	.01	.02***
Item G1.6	.05*	.05***	.05	.02**	-.017	.02***
Item G1.7	.04	-.03***	.00	-.02**	.004	.03***
Item G1.8	.06*	.04***	.05*	.03***	.022	.03***
Mean Item Correlation	**0.09**	**0.05**	**0.05**	**0.03**	**0.05**	**0.05**

Appendix C

This section provides some additional in depth analyses on the relationship between the LSI-OR, individual items, and the prediction of recidivism. In tables 1 through 5, the analyses from Appendix B have been repeated, further separating the Nonaboriginal sample into Caucasian (N=15,643) and Other (N=9109) offenders.

Table 1. LSI-OR General Risk/Need Item Correlations with General and Violent Recidivism as well as the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	Other (n=10,804)	Caucasian (n=15,646)	Other (n=10,804)	Caucasian (n=15,646)	Other (n=10,804)
Item 1	.26***	.26***	.16***	.16***	-.01	-.01
Item 2	.30***	.30***	.20***	.20***	-.02**	-.00
Item 3	.30***	.31***	.21***	.21***	-.01	.01
Item 4	.25***	.20***	.21***	.15***	.01	.02
Item 5	.22***	.17***	.17***	.14***	-.02*	-.01
Item 6	.30***	.29***	.21***	.19***	-.00	.02*
Item 7	.29***	.25***	.24***	.19***	.02*	.03**
Item 8	.34***	.32***	.25***	.21***	.00	.01
Item 9	.20***	.18***	.18***	.14***	-.03***	-.06***
Item 10	.23***	.22***	.20***	.17***	-.01	-.02*
Item 11	.14***	.16***	.12***	.11***	-.02**	-.03**
Item 12	.11***	.05***	.08***	.02	.01	.01
Item 13	.17***	.14***	.12***	.08***	-.04***	-.02*
Item 14	.18***	.17***	.12***	.10***	-.05***	-.05***
Item 15	.22***	.20***	.19***	.15***	-.03***	-.06***
Item 16	.22***	.20***	.19***	.15***	-.02**	-.05***
Item 17	.22***	.20***	.18***	.15***	-.03***	-.06***

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	Other (n=10,804)	Caucasian (n=15,646)	Other (n=10,804)	Caucasian (n=15,646)	Other (n=10,804)
Item 18	.03***	.00	-.02**	-.01	.09***	.15***
Item 19	.10***	.11***	.08***	.08***	.02**	.02*
Item 20	.09***	.08***	.07***	.06***	.04***	.00
Item 21	.14***	.11***	.11***	.07***	-.05***	-.03**
Item 22	.14***	.12***	.10***	.08***	-.01	.02*
Item 23	.25***	.22***	.18***	.13***	.02*	-.02
Item 24	.25***	.24***	.18***	.17***	-.08***	-.10***
Item 25	.28***	.26***	.22***	.18***	-.05***	-.07***
Item 26	.11***	.07***	.10***	.07***	.01	.02
Item 27	.14***	.11***	.13***	.08***	.00	.02
Item 28	.23***	.20***	.18***	.15***	.06***	.05***
Item 29	.22***	.20***	.16***	.14***	.04***	.06***
Item 30	.04***	.08***	.01	.02*	.08***	.09***
Item 31	.13***	.14***	.07***	.06***	.04***	.06***
Item 32	.14***	.09***	.04***	.01	-.01	-.02*
Item 33	.26***	.19***	.20***	.13***	-.04***	-.03**
Item 34	.11***	.06***	-.01	-.03**	-.01	-.01
Item 35	.26***	.19***	.24***	.16***	-.01	-.01
Item 36	.19***	.15***	.12***	.07***	-.03***	-.03**
Item 37	.20***	.14***	.11***	.06***	.01	.02
Item 38	.21***	.15***	.17***	.11***	-.01	.00
Item 39	.10***	.05***	.08***	.03**	.00	-.00
Item 40	.06***	.02	.02**	.02	.06***	.06***
Item 41	.23***	.18***	.18***	.15***	-.00	.01

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**
Item 42	.24***	.22***	.17***	.14***	.08***	.08***
Item 43	.24***	.23***	.19***	.16***	.02**	.03
Mean Correlation	**0.19**	**0.17**	**0.14**	**0.11**	**-0.02**	**0.00**

Table 2. LSI-OR Specific Risk/Need Item Correlations with General and Violent Recidivism as well as the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	Other (n=10,804)	Caucasian (n=15,646)	Other (n=10,804)	Caucasian (n=15,646)	Other (n=10,804)
Item B1.1	.28***	.28***	.21***	.17***	.02*	.03***
Item B1.2	.01	-.01	.02*	-.00	.00	.03**
Item B1.3	.01	.01	-.02*	.02	.03***	.03**
Item B1.4	.06***	.03**	.04***	.03**	.02**	.01
Item B1.5	.18***	.13***	.14***	.08***	.06***	.07***
Item B1.6	.12***	.05***	-.00	-.02*	.10***	.18***
Item B1.7	.06***	.03***	-.02***	-.00	.12***	.16***
Item B1.8	.00	.01	-.02**	-.01	.23***	.20***
Item B1.9	.11***	.06***	.08***	.04***	.06***	.05***
Item B1.10	.03***	.05***	.01	.03*	.02**	.03**
Item B1.11	.03***	.03**	-.00	-.00	.04***	.04***
Item B1.12	.19***	.17***	.16***	.14***	-.02*	-.01
Item B1.13	.20***	.26***	.15***	.14***	.04***	.02
Item B1.14	.07***	.02*	.05***	.02*	.02**	.03**
Item B2.1	.02**	.05***	-.00	.04***	.14***	.15***
Item B2.2	-.02*	-.01	-.03***	.00	.13***	.09***
Item B2.3	.17***	.16***	.10***	.08***	.01	.01
Item B2.4	.02**	.00	-.06***	-.05***	.10***	.17***
Item B2.5	.14***	.14***	.08***	.09***	.02	.02*
Item B2.6	.14***	.18***	.08***	.10***	.04***	.05***
Item B2.7	.05***	-.01	.03***	.01	.01	-.00
Item B2.8	.19***	.16***	.18***	.14***	.02	.02

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**
Item B2.9	.06***	.01	-.03***	-.03*	-.02**	-.02*
Mean Item Correlation	**0.09**	**0.08**	**0.05**	**0.04**	**0.05**	**0.06**

Table 3. LSI-OR Prison Experience Item Correlations with General and Violent Recidivism as well as the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**
Item C.1	.12***	.12***	.10***	.09***	.03***	.02*
Item C.2	.23***	.20***	.19***	.16***	.02*	.01
Item C.3	.03***	.05***	.01	.02*	-.02*	-.01
Item C.4	.12***	.08***	.09***	.04***	.04***	.02*
Item C.5	.06***	.04***	.03***	.02*	.03***	.04***
Item C.6	.15***	.12***	.11***	.08***	.02*	.02
Item C.7	.07***	.04***	.04***	.03**	.02*	.011
Item C.8	.15***	.13***	.13***	.09***	.03***	.05***
Item C.9	.11***	.08***	.12***	.07***	.02*	.02
Mean Item Correlation	**0.12**	**0.10**	**0.09**	**0.07**	**0.02**	**0.02**

Table 4. LSI-OR Social, Health and Mental Health Item Correlations with General and Violent Recidivism and the Override Score

	General Recidivism		**Violent Recidivism**		**Override Score**	
	Caucasian (n=15,646)	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**
Item F1.1	.15***	.14***	.14***	.12***	.01	.00
Item F1.2	.11***	.12***	.10***	.10***	.02**	.01
Item F1.3	.14***	.11***	.12***	.07***	.02***	.02
Item F1.4	.02***	-.02	.04***	-.01	.01	.02
Item F1.5	.00	-.00	.01	.00	.03***	-.00
Item F1.6	-.01	-.02	-.00	.00	-.00	-.01
Item F1.7	.10***	.03***	.08***	.04***	.05***	.00
Item F1.8	.01	.00	.00	.00	.02**	.02
Item F1.9	.02	.02	-.00	-.00	.04***	.05***
Item F1.10	.07***	.01	.03***	.02*	.03***	.03*
Item F1.11	.10***	.05***	.06***	.01	.01	.00
Item F1.12	.02*	-.01	.02*	.00	.03***	.02*
Item F1.13	-.02**	.02	-.01	.03**	.02*	.05***
Item F1.14	.09***	.05***	.06***	.01	.00	.01
Item F1.15	.08***	.05***	.05***	.03**	-.00	-.00
Item F1.16	.06***	.02	.06***	.03**	.01	-.00
Item F1.17	.08***	.04***	.06***	.03**	.01	.00
Item F1.18	.08***	.07***	.06***	.04***	-.00	.01
Item F1.19	.03***	.05***	.02**	.03**	.01	.02*
Item F2.1	.21***	.18***	.18***	.13***	.02	.03**
Mean Item Correlation	**0.07**	**0.05**	**0.05**	**0.03**	**0.02**	**0.01**

Table 5. LSI-OR Special Responsivity Considerations Item Correlations with General and Violent Recidivism and the Override Score

	General Recidivism		Violent Recidivism		Override Score	
	Caucasian (n=15,646)	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**	**Caucasian (n=15,646)**	**Other (n=10,804)**
Item G1.1	.20***	.20***	.13***	.12***	.06***	.05***
Item G1.2	.10***	.12***	.05***	.04***	.13***	.16***
Item G1.3	.04***	.03**	.02	.00	.04***	.02*
Item G1.4	-.02*	.01	.00	-.00	.03***	.09***
Item G1.5	-.01	.02*	.00	.00	-.00	.03**
Item G1.6	.05***	.03**	.02*	.02	.03**	.02*
Item G1.7	-.00	-.03**	-.01	-.01	.04***	.01
Item G1.8	.04***	.01	.03***	.02*	.03***	.03***
Mean Item Correlation	**0.05**	**0.05**	**0.03**	**0.02**	**0.04**	**0.05**

Table 6. Recidivism rates as a function of raw LSI-OR score for Aboriginal and Nonaboriginal offenders.

LSI-OR Score	**Aboriginal (n=1,692)**		**Nonaboriginal (n=24,758)**	
	Number of Cases	Recidivism Rate	Number of Cases	Recidivism Rate
0	4	0.00%	347	4.90%
1	10	20.00%	979	7.66%
2	18	5.56%	1268	10.41%
3	18	11.11%	1412	12.39%
4	22	36.36%	1273	15.48%
5	29	24.14%	1382	15.92%
6	29	37.93%	1424	18.54%
7	33	45.45%	1239	20.74%
8	26	26.92%	1249	21.78%
9	41	43.90%	1184	26.35%
10	39	20.51%	1122	25.40%
11	49	28.57%	1147	30.08%
12	50	38.00%	945	34.71%
13	65	41.54%	912	35.75%
14	50	46.00%	834	36.93%
15	63	52.38%	753	42.23%
16	58	51.72%	783	41.51%
17	73	50.68%	702	45.87%
18	84	53.57%	643	48.83%
19	50	56.00%	631	52.46%
20	52	57.69%	480	57.29%
21	52	61.54%	432	56.94%
22	53	49.06%	377	60.74%
23	59	61.02%	397	60.45%
24	50	62.00%	356	65.45%
25	54	66.67%	304	67.76%
26	55	63.64%	322	63.66%
27	43	74.42%	293	66.21%
28	37	72.97%	289	68.17%
29	48	75.00%	246	75.61%
30	74	68.92%	208	80.29%
31	42	73.81%	185	82.16%
32	44	77.27%	136	85.29%

LSI-OR Score	Aboriginal (n=1,692)		Nonaboriginal (n=24,758)	
	Number of Cases	Recidivism Rate	Number of Cases	Recidivism Rate
33	48	89.58%	155	79.35%
34	34	85.29%	116	82.76%
35	33	87.88%	79	82.28%
36	24	83.33%	56	91.07%
37	21	80.95%	48	83.33%
38	13	92.31%	31	96.77%
39	13	92.31%	8	87.50%
40	12	91.67%	7	100.00%
41	13	100.00%	2	100.00%
42	6	100.00%	2	50.00%
43	1	100.00%	0	n/a
Total	1692	57.03%	24758	33.08%

A chi square analysis was run to examine recidivism rates as a function of raw LSI-OR score, as presented in Table 6. For Aboriginal offenders, the chi square analysis was significant, $\chi(43)= 265.75$, $p < .001$. The chi square was also significant for the Nonaboriginal offenders, $\chi(42) = 4634.96$, $p<.001$. This analysis was then followed up to examine recidivism rates as a function of initial and final risk, for both Aboriginal and Nonaboriginal offenders. The chi square was significant for initial risk level for both Aboriginal offenders, $\chi(4)= 3210.18$, $p < .001$, and Nonaboriginal offenders, $\chi(4)= 214.05$, $p < .001$. The same was true for final risk level for the Aboriginal, $\chi(4)= 201.30$, $p < .001$, and Nonaboriginal offenders, $\chi(4) = 4360.71$, $p<.001$. These are presented in Table 7.

Table 7. Recidivism rates as a function of LSI-OR initial and final risk level by Aboriginal status.

	Aboriginal (n=1,692)		**Nonaboriginal (n=24,758)**	
	Initial Risk	**Final Risk**	**Initial Risk**	**Final Risk**
Very Low	18.06%	18.03%	11.29%	11.62%
Low	33.50%	32.54%	21.18%	21.18%
Medium	47.23%	47.55%	39.69%	34.16%
High	63.82%	63.14%	63.24%	56.36%
Very High	81.75%	82.17%	82.96%	78.47%
Total	57.03%	57.03%	33.08%	33.08%

These chi square analyses were them followed up to examine violent recidivism rates as a function of raw LSI-OR score, as presented in Table 8. Similar to the findings presented for the general recidivism rates, all analyses were significant for the raw scores and recidivism for both Aboriginal offenders [$\chi(43) = 81.38$, $p < .001$] and Nonaboriginal offenders [$\chi(42) = 2345.88$, $p<.001$]. This analysis was then followed up to examine violent recidivism rates as a function of initial and final risk, for both Aboriginal and Nonaboriginal offenders. The chi square was significant for initial risk level for both Aboriginal offenders, $\chi(4)= 47.36$, $p < .001$, and Nonaboriginal offenders, $\chi(4)= 2184.42$, $p < .001$. The same was true for final risk level for the Aboriginal, $\chi(4)= 40.58$, $p < .001$, and Nonaboriginal offenders, $\chi(4) = 1516.32$, $p<.001$. These results are presented in Table 9.

Table 8. Violent recidivism rates as a function of raw LSI-OR score for Aboriginal and Nonaboriginal offenders.

LSI-OR Score	Aboriginal Violent Recidivism (n=1,692)	Nonaboriginal Violent Recidivism (n=24,758)
0	0%	2.6%
1	0%	3.3%
2	0%	3.1%
3	0%	3.7%
4	4.5%	4.6%
5	6.9%	5.3%
6	10.3%	5.0%
7	6.1%	6.3%
8	0%	7.0%
9	9.8%	9.0%
10	2.6%	7.3%
11	8.2%	9.4%
12	8.0%	11.4%
13	6.2%	11.8%
14	12.0%	12.8%
15	19.0%	12.5%
16	6.9%	14.3%
17	9.6%	15.2%
18	19.0%	19.1%
19	18.0%	20.4%
20	11.5%	22.9%
21	17.3%	23.6%
22	13.2%	24.9%
23	18.6%	24.2%
24	14.0%	27.5%
25	18.5%	31.6%
26	10.9%	31.4%
27	18.6%	30.7%
28	24.3%	33.9%
29	29.2%	33.3%
30	23.0%	37.5%
31	21.4%	42.2%
32	25.0%	36.8%
33	20.8%	42.6%
34	29.4%	48.3%

LSI-OR Score	Aboriginal Violent Recidivism (n=1,692)	Nonaboriginal Violent Recidivism (n=24,758)
35	24.2%	35.4%
36	16.7%	50.0%
37	33.3%	50.0%
38	7.7%	45.2%
39	30.8%	50.0%
40	16.7%	42.9%
41	15.4%	50.0%
42	33.3%	50.0%
43	n/a	n/a

Table 9. Recidivism rates as a function of LSI-OR initial and final risk level by Aboriginal status.

	Aboriginal Violent Recidivism (n=1,692)		**Nonaboriginal Violent Recidivism (n=24,758)**	
	Initial Risk	Final Risk	Initial Risk	Final Risk
Very Low	1.39%	1.64%	3.60%	4.01%
Low	6.09%	6.51%	6.55%	7.20%
Medium	12.18%	12.48%	13.14%	11.50%
High	17.30%	16.47 %	27.66%	23.68%
Very High	23.02%	23.12%	41.72%	37.83%
Total	14.95%	14.95%	12.45%	12.45%

Next, going back to the examination of general recidivism and individual items, the relationship between the item scores on each of the specific items was examined in Table 10. General recidivism rates presented based on the individual item scores.

Table 10. Item analysis with recidivism with recidivism rates presented by the presence or absence of a score on each item.

LSI-OR Item		**Nonaboriginal (n=24,758)**	**Aboriginal (n=1,692)**
Item 1	No	18.0%	35.7%
	Yes	45.0%	62.2%
Item 2	No	20.5%	40.6%
	Yes	51.5%	64.6%
Item 3	No	22.5%	42.9%
	Yes	55.6%	67.0%
Item 4	No	28.4%	50.24%
	Yes	62.8%	75.11%
Item 5	No	29.3%	48.26%
	Yes	61.2%	79.05%
Item 6	No	22.1%	41.59%
	Yes	53.7%	67.36%
Item 7	No	29.0%	51.50%
	Yes	75.4%	80.31%
Item 8	No	22.9%	39.39%
	Yes	60.3%	72.56%
Item 9	No	26.6%	44.66%
	Yes	46.3%	64.86%
Item 10	No	27.3%	47.24%
	Yes	54.1%	66.51%
Item 11	No	30.3%	52.68%
	Yes	51.6%	64.80%
Item 12	No	31.1%	53.86%
	Yes	43.6%	62.04%
Item 13	No	25.7%	46.45%
	Yes	42.0%	61.04%

LSI-OR Item		Nonaboriginal (n=24,758)	Aboriginal (n=1,692)
Item 14	No	27.6%	51.34%
	Yes	48.7%	68.18%
Item 15	No	24.6%	41.94%
	Yes	45.9%	64.22%
Item 16	No	25.1%	42.39%
	Yes	46.2%	64.63%
Item 17	No	24.9%	42.09%
	Yes	46.2%	64.73%
Item 18	No	32.1%	55.83%
	Yes	34.8%	58.49%
Item 19	No	28.4%	52.04%
	Yes	39.4%	61.09%
Item 20	No	30.5%	54.92%
	Yes	41.1%	60.75%
Item 21	No	29.4%	47.81%
	Yes	45.7%	63.32%
Item 22	No	23.3%	44.72%
	Yes	37.8%	61.43%
Item 23	No	24.4%	45.57%
	Yes	48.6%	67.07%
Item 24	No	19.0%	32.96%
	Yes	43.8%	61.54%
Item 25	No	22.8%	39.70%
	Yes	50.4%	64.92%
Item 26	No	32.4%	55.87%
	Yes	65.7%	70.68%
Item 27	No	32.5%	54.84%
	Yes	59.5%	69.92%
Item 28	No	27.1%	49.49%
	Yes	52.1%	70.11%

LSI-OR Item		Nonaboriginal (n=24,758)	Aboriginal (n=1,692)
Item 29	No	28.1%	47.27%
	Yes	56.2%	75.08%
Item 30	No	31.3%	52.40%
	Yes	37.3%	66.20%
Item 31	No	30.6%	52.66%
	Yes	50.8%	70.43%
Item 32	No	26.1%	38.26%
	Yes	41.1%	59.99%
Item 33	No	23.0%	44.81%
	Yes	47.7%	63.87%
Item 34	No	29.7%	43.99%
	Yes	42.0%	63.16%
Item 35	No	26.8%	51.17%
	Yes	55.9%	71.17%
Item 36	No	26.3%	42.02%
	Yes	46.4%	63.81%
Item 37	No	27.9%	46.01%
	Yes	50.6%	66.38%
Item 38	No	29.2%	49.78%
	Yes	58.6%	71.20%
Item 39	No	31.8%	53.53%
	Yes	51.9%	69.89%
Item 40	No	32.6%	55.88%
	Yes	47.3%	81.58%
Item 41	No	29.6%	48.96%
	Yes	67.0%	79.60%
Item 42	No	24.8%	44.37%
	Yes	48.7%	68.15%
Item 43	No	28.6%	49.64%
	Yes	64.1%	71.65%

Finally, a domain analysis was conducted to examine the LSI-OR subsections using correlations and ROC values for Aboriginal and Nonaboriginal offenders for general and violent recidivism. The results of these analyses are presented in Table 11.

Table 11. Correlations and ROC scores for the prediction of general and violent recidivism for the LSI-OR subsections.

	General Recidivism		Violent Recidivism	
Subscale	**Aboriginal Offender (n=1,692)**	**Nonaboriginal offender (n=24,758)**	**Aboriginal Offender (n=1,692)**	**Nonaboriginal offender (n=24,758)**
Correlation				
Criminal History	.354***	.410***	.216***	.286***
Education Employment	.268***	.297***	.131***	.228***
Family Marital	.135***	.161***	.047	.103***
Leisure/Recreation	.230***	.246***	.118***	.171***
Companions	.240***	308***	.114***	.233***
Procriminal Attitude/Orientation	.264***	.239***	.106***	.156***
Substance Abuse	.280***	.279***	.068***	.169***
Antisocial Pattern	.318***	.325***	.164***	.234***
Area Under Curve				
Criminal History	.733*** (CI: .726 -.740)	.710*** (CI: .686 -.735)	.678*** (CI: .644-.712)	.722*** (CI: .711 -.732)
Education Employment	.677*** (CI: .669 -.684)	.657*** (CI: .631-.683)	.602*** (CI: .566-.637)	.688*** (CI: .678-.698)
Family Marital	.593*** (CI: .586 -.601)	.576*** (CI: .548 -.603)	.536*** (CI: .498-.575)	.584*** (CI: .573-.595)
Leisure/Recreation	.642*** (CI: .634 -.649)	.628*** (CI: .601-.655)	.592*** (CI: .555-.630)	.640*** (CI: .630 -.651)
Companions	.676*** (CI: .669 -.683)	.629*** (CI: .602 -.656)	.590*** (CI: .556-.624)	.686*** (CI: .676-.696)

Procriminal Attitude/Orientation	.627*** (CI: .620 -.635)	.651*** (CI: .625 -.677)	.589*** (CI: .552-.627)	.618*** (CI: .607-.629)
Substance Abuse	.661*** (CI: .654 -.668)	.662*** (CI: .636 -.688)	.556*** (CI: .517-.594)	.634*** (CI: .623-.645)
Antisocial Pattern	.666*** (CI: .658 -.673)	.676*** (CI: .650 -.701)	.626*** (CI: .589-.664)	.664*** (CI: .653-.675)

Appendix D

Ministry of the Solicitor General and Correctional Services
Ontario

Level of Service Inventory: Ontario Revision (LSI-OR)

Freedom of Information (F.O.I.) Notice: This personal information is being collected under the authority of Section 5 of the Ministry of Correctional Services Act (RSO 1990, Chapter M.22) and may be used for the purposes of assessment, classification and program placement during this and future periods of community supervision or incarcerations. Questions about the collection of this information should be directed to the Probation and Parole Officer, Area Manager, or Superintendent.

Surname	Given Name	OMS Client Number	Status
			☐ Youth ☐ Adult
Setting	**Sources of Information**	**Birthdate** DD MM YY	☐ Male ☐ Female

Context: Community
☐ PSR/PDR ☐ Parole Intake
☐ Probation Intake ☐ P&P Reassessment

Institution
☐ Classification ☐ Internal/Program ☐ Community Release
☐ Reclassification ☐ Parole Hearing

Youth
☐ Secure Custody
☐ Open Custody

A. GENERAL RISK/NEED FACTORS

1. CRIMINAL HISTORY
__ 1 Any prior y.o. dispositions (number =) or adult dispositions (number =)
__ 2 Two or more prior adult/youth dispositions
__ 3 Three or more prior adult/youth dispositions
__ 4 Three or more present offences (number =)
__ 5 Arrested or charged under age 16
__ 6 Ever incarcerated upon adjudication
__ 7 Ever punished for institutional misconduct/ behaviour report (number =)
__ 8 Charge laid, probation breached or parole suspended during prior community supervision
__ **Subtotal** **Strength** __

2. EDUCATION/EMPLOYMENT
__ 9 Currently unemployed
__ 10 Frequently unemployed
__ 11 Never employed for full year
__ 12 Less than regular grade 10 or equivalent
__ 13 Less than regular grade 12 or equivalent
__ 14 Suspended or expelled at least once
__ 15 Participation/Performance ( )
__ 16 Peer interactions ( )
__ 17 Authority interactions ( )
__ **Subtotal** **Strength** __

3. FAMILY/MARITAL
__ 18 Dissatisfaction with marital or equivalent situation ( )
__ 19 Nonrewarding, parental ( )
__ 20 Nonrewarding, other relatives ( )
__ 21 Criminal - Family/Spouse
__ **Subtotal** **Strength** __

4. LEISURE/RECREATION
__ 22 No recent participation in an organized activity
__ 23 Could make better use of time ( )
__ **Subtotal** **Strength** __

5. COMPANIONS
__ 24 Some criminal acquaintances
__ 25 Some criminal friends
__ 26 No anti-criminal acquaintances
__ 27 No anti-criminal friends ( )
__ **Subtotal** **Strength** __

6. PROCRIMINAL ATTITUDE/ORIENTATION
__ 28 Supportive of crime ( )
__ 29 Unfavourable toward convention ( )
__ 30 Poor, toward sentence/offence
__ 31 Poor, toward supervision/treatment
__ **Subtotal** **Strength** __

7. SUBSTANCE ABUSE
__ 32 Alcohol problem, ever
__ 33 Drug problem, ever
__ 34 Alcohol problem, currently ( )
__ 35 Drug problem, currently ( )
__ 36 Law violations
__ 37 Marital/Family
__ 38 School/Work
__ 39 Medical or other clinical indicators
__ **Subtotal** **Strength** __

8. ANTISOCIAL PATTERN
__ 40 Specialized assessment for Antisocial pattern
__ 41 Early and diverse antisocial behaviour: Arrested/charged under age 16 (Item 5 ___), plus at least one of:
a) official record of assault/ violence (___)
b) escape history (____)
c) charge laid, probation breached or parole suspended during prior community supervision (Item 8 ____)
__ 42 Criminal attitude. At least one of: (Item 28 ___), (Item 29 ___), (Item 31 ___)
__ 43 A pattern of generalized trouble. At least four of: Financial problems (____), 3 or more address changes (____) (Item 11 ___), (Item 12 ___), (Item 14 ___), (Item 19 ___), (Item 23 ___), (Item 27 ___)
__ **Subtotal** **Strength** __

B. SPECIFIC RISK/NEED FACTORS

1. PERSONAL PROBLEMS WITH CRIMINOGENIC POTENTIAL
__ 1 Clear problems of compliance (specific conditions)
__ 2 Diagnosis of "psychopathy"
__ 3 Diagnosis of other personality disorder
__ 4 Threat from third party
__ 5 Problem-solving/self-management skill deficits
__ 6 Anger management deficits
__ 7 Intimidating/Controlling
__ 8 Inappropriate sexual activity
__ 9 Poor social skills
__ 10 Peers outside age range
__ 11 Racist/sexist behaviour
__ 12 Underachievement
__ 13 Outstanding charges
__ 14 Other *(specify)*_____

2. HISTORY OF PERPETRATION
__ 1 Sexual assault (extrafamilial)
__ 2 Sexual assault (intrafamilial)
__ 3 Physical assault (extrafamilial)
__ 4 Physical assault (intrafamilial)
__ 5 Assault on an authority figure
__ 6 Weapon use
__ 7 Fire setting
__ 8 Escapes/U.A.L.
__ 9 Impaired Driving

C. PRISON EXPERIENCE: INSTITUTIONAL FACTORS
__ 1 Last classification maximum
__ 2 Last classification medium
__ 3 Last classification minimum
__ 4 Protective custody
__ 5 Treatment recommended/ordered
__ 6 Misconduct/Behaviour Report current incarceration (number = _____)
__ 7 Administrative segregation
__ 8 Security management concerns
__ 9 Past federal penitentiary

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D. RISK/NEED SUMMARY

Total LSI-OR Score _____ *(From Section A)*

Total Strengths _____ *(From Section A)*

Specific risk/need factors _____ *(From Section B)*

Summary of strengths *(Positives: reasons for lowering security/supervision or releasing clients, From Section A)*

Summary of added concerns *(Negatives: reasons for increasing security/supervision or not releasing clients, From Sections B & C)*

E. RISK/NEED PROFILE

Very High	-	-	-	-	-	-	-	-	30+	Very High
High	7-8	-	-	-	4	4	-	4	20-29	High
Medium	5-6	8-9	3-4	2	3	3	6-8	2-3	11-19	Medium
Low	3-4	3-7	1-2	1	1-2	1-2	2-5	1	5-10	Low
Very Low	0-2	0-2	0	0	0	0	0-1	0	0-4	Very Low
Risk Category	Crim. Hist.	Employ. Educ.	Fam. Mar.	Leis. Rec.	Comp.	Procr. Attit.	Subs. Abuse	Antisoc. Pattern	Total *(Section A)*	Override: Yes No

F. OTHER CLIENT ISSUES

1. SOCIAL, HEALTH, AND MENTAL HEALTH

__ 1 Financial problems
__ 2 Homeless or transient
__ 3 Accommodation problems
__ 4 Health problems
__ 5 Depressed
__ 6 Physical disability
__ 7 Low self-esteem
__ 8 Shy/withdrawn
__ 9 Diagnosis of psychosis
__ 10 Suicide attempts/threat
__ 11 Learning disability
__ 12 Other evidence of emotional distress
*(Specify)*_____
_____
__ 13 Immigration issues
__ 14 Victim: family violence
__ 15 Victim: physical assault
__ 16 Victim: sexual assault
__ 17 Victim: emotional abuse
__ 18 Victim of neglect
__ 19 Other *(specify)*_____

2. BARRIER TO RELEASE

__ 1 Community supervision inappropriate
(Specify reason) _____
_____
_____

G. SPECIAL RESPONSIVITY CONSIDERATIONS

__ 1 Motivation as a barrier
__ 2 Engages in denial/minimization
__ 3 Interpersonally anxious
__ 4 Cultural issues
__ 5 Ethnicity issues
__ 6 Low intelligence
__ 7 Communication barriers
__ 8 Other *(specify)* _____
_____
_____

H. PROGRAM/PLACEMENT DECISION

Type of Decision	Recommendation/Decision			Program/Institutional Placement
☐ Institution, Secure/Open Custody:	☐ Minimum	☐ Medium	☐ Maximum	
☐ Release Recommendation:	☐ Yes	☐ No		
☐ Community:	☐ Minimum	☐ Moderate	☐ Maximum	

Comments

Assessor's Name	Assessor's Position	Assessor's Signature	DD MM YY

Placement Decision	Explanation *(if different from above)*

Authorizing Name	Authorizing Position	Authorizing Signature	DD MM YY

Ministry of the Solicitor General and Correctional Services
Ontario

Level of Service Inventory: Ontario Revision (LSI-OR) Supplementary Information

The following is supplementary information which may affect the offender's institution classification/reclassification, release planning or community supervision. The information should relate to factors checked on the LSI-OR form.

I. DISPOSITION/SENTENCE LENGTH

Institution Admission			Sentence Date			Parole Eligibility			Discharge Possible			Final Warrant Expiry		
DD	MM	YY	DD	MM	YY	DD	MM	YY	DD	MM	YY	DD	MM	YY

J. GENERAL AND SPECIFIC RISK/NEED FACTORS

CRIMINAL HISTORY Information Source(s)

PREVIOUS OFFENCE(S) *(Most Recent Serious Offences)*

Offence(s)	Year	Disposition	Institution Placement *(if applicable)*	Comments

CIRCUMSTANCES OF CURRENT OFFENCE(S) Information Source(s)

Details, including date of offence(s), type, planned, weapon type, victim's age/sex, extent of injuries, damage or value of goods, motive, remorse, etc.

Court Recommendations *(if applicable)*

SUMMARY OF FINDINGS Information Source(s)

(Ite.
btotal

K. PROGRESS RECORD
(Specify name and date with each new entry)

L. DISCHARGE SUMMARY Discharge/Completion Date DD MM YY

Type of Discharge/Completion: ☐ Bail ☐ Fine Paid ☐ Probation to Follow ☐ Parole Granted
☐ Sentence Satisfied ☐ Probation Complete ☐ Parole Complete ☐ Other (specify)_____

SUMMARY *(Recommendations for future placements)*

Summary Completed by (Name/Title) Signature DD MM YY

Authorizing Signature Setting DD MM YY

This document to be forwarded to

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