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Do Static Risk Factors Predict Differently for Aboriginal Sex Offenders? A Multi-Site
Comparison using the Original and Revised Static-99 and Static-2002 Scales

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Abstract

There is much concern about the extent to which risk assessment tools designed to predict recidivism are equally valid for both Aboriginal and non-Aboriginal offenders. The current study compared Aboriginal and non-Aboriginal male sex offenders on items and total scores of the original and revised Static-99 and Static-2002 scales. The study included five independent Canadian samples with Static-99 and Static-99R scores (319 Aboriginals and 1,269 non-Aboriginals), three of which also had Static-2002 and Static-2002R scores (209 Aboriginals and 955 non-Aboriginals). Aboriginal sex offenders scored significantly higher than non-Aboriginal sex offenders on total scores and items indicative of general criminality, and tended to score lower on items indicative of sexual deviancy. Static-99/R total scores and items generally predicted sexual recidivism with similar accuracy for Aboriginal and non-Aboriginal sex offenders. In contrast, significant differences were found for Static-2002/R total scores and several of their items, with lower predictive accuracy for Aboriginals. The results suggest that at least some items of the Static scales are not as predictive for Aboriginal than non-Aboriginal sex offenders, with differences found on Static-2002/R rather than Static-99/R scales.

Keywords: Aboriginal, sex offenders, risk assessment, Static-99, Static-2002

Do Static Risk Factors Predict Differently for Aboriginal Sex Offenders? A Multi-Site Comparison using the Original and Revised Static-99 and Static-2002 Scales

The overrepresentation of Aboriginal offenders within the Canadian criminal justice system continues to cause serious concerns, despite attempts by the federal government to lessen this disparity (Canadian Criminal Code § 718.2(e); *R. v. Gladue*, 1999). Although Aboriginals represent 4% of the Canadian adult male population (Statistics Canada, 2008) they disproportionately represent 19% of incarcerated men in Canada (Public Safety Canada, 2009) and 18% of men incarcerated for sex offences (Correctional Service Canada, 2008). Despite the continued overrepresentation of Aboriginal offenders within the criminal justice system, the effective management of Aboriginal offenders is made difficult due to a general lack of knowledge regarding the similarities and differences between Aboriginal and non-Aboriginal offenders in general, and within specific offender populations, such as sex offenders.

Research has mainly focused on comparing and contrasting characteristics of Aboriginal and non-Aboriginal offender populations. It has been consistently reported that Aboriginal offenders exhibit more risk factors compared to non-Aboriginal offenders. For example, Aboriginal offenders are younger and less educated (Statistics Canada, 2006), have lengthier criminal histories (Dell & Boe, 2000; Holsinger, Lowenkamp, & Latessa, 2003), commit more violent crimes (Trevathan, Moore, & Rastin, 2002), and are more likely to be classified as higher-risk and higher-need (Rugge, 2006; Statistics Canada, 2006) compared to non-Aboriginal offenders. In addition, Aboriginal offenders are more likely to experience poverty and family dysfunction in childhood compared to non-Aboriginal offenders (Johnston, 1997; Trevethan, Auger, Moore, MacDonald, & Sinclair, 2002).

In terms of predicting the risk of recidivism, the majority of Andrews and Bonta's (2010) central 8 risk factors (i.e., antisocial attitudes, antisocial peers, history of antisocial behaviour, antisocial personality, and substance abuse) predict recidivism equally well for both groups (B.C. Public Safety & Solicitor General, 2004; Bonta, 1989; Bonta, LaPrairie, &

Wallace-Capretta, 1997). Similarly positive findings have been reported for the predictive validity of risk scales designed to assess risk of future criminal behaviour. The Level of Service Inventory (LSI) and its subsequent adaptations (e.g., LSI:R, LSI:OR, and YLS:CMI), for example, have been shown to predict recidivism equally well for Aboriginal and non-Aboriginal offenders (Bonta, 1989; Brews, Wormith, & Guzzo, 2009; Gossner & Wormith, 2007; Gross & Sroga, 2008; Tanasichuk, Wormith, & Guzzo, 2009).

From these results, it appears that within general offender populations, established risk factors and risk scales are equally predictive of recidivism for Aboriginal and non-Aboriginal offenders. It is important to note, however, that this review is unique to Canadian Aboriginal offender samples. It is possible that these findings may not replicate in Aboriginal samples outside of Canada. In fact, the LSI:R did not predict recidivism for Aboriginal offenders in the United States (AUC = .61, 95% CI = .49 to .71, $n = 100$), albeit the predictive accuracy of the LSI:R was similarly low for the non-Aboriginal offenders in this sample (AUC = .63, 95% CI = .53 to .71, $n = 162$; Holsinger, Lowenkamp, & Latessa, 2006).

Although there is some research on general Aboriginal offenders, much less has been conducted on Aboriginal sex offenders. The available studies have identified similarities between Aboriginal general offenders and Aboriginal sex offenders. Firstly, similar to Aboriginal nonsexual offenders, Aboriginal sex offenders score higher on a large number of risk factors compared to their non-Aboriginal counterparts. For example, Aboriginal sex offenders are significantly younger and have lengthier criminal histories compared to non-Aboriginal sex offenders (Ellerby & MacPherson, 2002; Olver & Wong, 2006; Rastin & Johnson, 2002). Also consistent with the literature on general Aboriginal offenders (e.g., Statistics Canada, 2006), Aboriginal sex offenders are more likely to have lower educational achievement, higher rates of unemployment, and a history of substance abuse (Ellerby & MacPherson, 2002; Olver & Wong, 2006).

When looking at risk factors specific to sexual offending, however, Aboriginal sex offenders actually exhibit fewer risk factors than non-Aboriginal sex offenders. For example, Aboriginal sex offenders have fewer sexually deviant interests (e.g., violent sexual fantasies) and paraphilias (e.g., exhibitionism) compared to non-Aboriginal sex offenders (Ellerby & MacPherson, 2002) and are less likely to have male victims (Ellerby & MacPherson, 2002; Nahanee, 1996; Rastin & Johnson, 2002; Rojas & Gretton, 2007). Another notable difference is that Aboriginal sex offenders are less likely to target younger victims than non-Aboriginal sex offenders (Ellerby & MacPherson, 2002).

In sum, the available studies have found key differences in the presence of criminogenic factors associated with both general and sexual recidivism between Aboriginal and non-Aboriginal sex offenders. On the one hand, Aboriginal sex offenders possess more risk factors related to general antisociality and criminality, such as having lengthier criminal records, being unemployed, and having substance abuse problems. On the other hand, they also possess fewer risk factors related to sexual recidivism, such as deviant sexual interests. In addition, Aboriginal sex offenders show higher rates of sexual recidivism (Rastin & Johnson, 2002; Rojas & Gretton, 2007; Williams, Valleé, & Staubi, 1997), violent recidivism (Rojas & Gretton, 2007), and general recidivism (Rastin & Johnson, 2002; Rojas & Gretton, 2007) compared to non-Aboriginal sex offenders. It is unclear, however, whether these observed differences in recidivism rates are simply due to Aboriginals being higher risk and, thus, would disappear after accounting for differences in risk level.

For evaluators involved in the risk assessment of Aboriginal sex offenders, an important issue to consider is the extent to which the available tools (and their items) are equally predictive for both groups. Differences between Aboriginal and non-Aboriginal sex offenders on key characteristics related to criminal behaviour (e.g., deviant sexual interest, substance abuse) do not mean that available risk scales are invalid for Aboriginal sex offenders. These findings certainly should, however, motivate researchers to examine possible differences in the predictive accuracy of scales assessing these factors.

Preliminary research has suggested that Static-99 is equally predictive of sexual recidivism for Aboriginal ($n = 109$) and non-Aboriginal sex offenders ($n = 254$; $AUC = .67$ for both groups; Nicholaichuk, 2001). Studies examining differences on scores and predictive accuracy of risk scales with larger and more varied samples continue to be sorely needed to help understand the applicability of risk scales, such as Static-99, to Aboriginal sex offenders.

In a more recent study, we examined the predictive validity of the STABLE-2007 (a dynamic risk scale designed to predict sexual recidivism), in an attempt to further extend the research on the predictive accuracy of risk scales for Aboriginal sex offenders (Helmus, Babchishin, & Blais, 2011). The STABLE-2007 is a 13-item scale divided into 5 subsections: social influences (e.g., positive influences in the offender's life), intimacy deficits (e.g., capacity for relationship stability), general self-regulation (e.g., impulsive acts), sexual self-regulation (e.g., deviant sexual interests), and cooperation with supervision. In this study, Aboriginal ($N = 89$) and non-Aboriginal ($N = 520$) sex offenders were first compared on their STABLE-2007 item scores and total score. Results indicated that Aboriginal sex offenders scored significantly higher on the STABLE-2007 total score as well as on items indicative of general antisociality (i.e., cooperation with supervision, impulsivity, lack of concern for others, and poor problem-solving). There were no differences between Aboriginal and non-Aboriginal sex offenders on social influence items or sexual self-regulation items. In the second part of this study, we examined differences in the predictive validity of both STABLE-2007 item scores and total score. Despite the fact that Aboriginal sex offenders scored, on average, higher on the risk factors measuring general criminality compared to non-Aboriginal sex offenders, these items were significantly less predictive for Aboriginal than for non-Aboriginal sex offenders. In contrast, items assessing sexual self-regulation, social influences, and relationship stability predicted similarly for both groups.

These findings are surprising considering research findings on general offenders, albeit few, have found risk factors indicative of antisociality and general criminality to be

equally predictive for both Aboriginal and non-Aboriginal offenders. One plausible explanation for these results is that psychologically meaningful risk factors (e.g., antisociality) are not adequately represented by the items in the STABLE-2007. Specifically, Mann, Hanson, and Thornton (2010) have proposed that risk factors generally measured in research studies and risk instruments are markers of underlying propensities. For example, antisociality may be theorized to be an underlying propensity that plays a causal part in offending. Items such as number of past criminal offences or poor problem-solving are included in risk instruments in an attempt to capture or tap into the propensity for antisociality. It is possible that the causal factors (propensities) for recidivism are similar for Aboriginal and non-Aboriginal offenders, but that the risk factors (markers) as assessed by certain items are not adequately measuring these propensities for Aboriginal offenders.

Our previous study (Helmus, Babchishin et al., 2011) suggests that the markers used in the STABLE-2007 to assess the underlying propensity of general antisociality (e.g., lack of concern for others, poor cognitive problem-solving) do not adequately assess antisociality for Aboriginal sex offenders- as evidenced by significantly lower predictive accuracy for this group compared to non-Aboriginals. It is therefore possible that items other than the ones found on the STABLE-2007 may better represent general antisociality in Aboriginal sex offenders.

Current Study

There is some evidence suggesting there are differences in the predictive accuracy of risk factors between Aboriginal and non-Aboriginal sex offenders. It is also possible that findings from the literature on general Aboriginal offenders (e.g., little to no difference in predictive accuracy of the risk instruments between Aboriginals and non-Aboriginals) do not translate to Aboriginal sex offenders, either because of differences in the risk scales examined in the studies or true differences between Aboriginal general offenders and Aboriginal sex offenders. The aim of the current study was to examine differences between Aboriginal and non-Aboriginal sex offenders on a wider range of risk markers. Specifically,

the purpose of the current study was to explore whether there are differences between Aboriginal and non-Aboriginal sex offenders (a) on individual items and subscales of the original and revised Static-99 and Static-2002, and (b) in the predictive accuracy of these risk instruments (Static-99/R and Static-2002/R). Static-99 is the most widely used risk instrument for sex offenders in Canada and the United States and Static-2002 is the second most used risk scale in Canada (Archer, Buffington-Vollum, Stredny, & Handel, 2006; Jackson & Hess, 2007; McGrath, Cumming, Burchard, Zeoli, & Ellerby, 2010). Recently, the age weights of both these risk instruments were revised to accommodate increasing numbers of older (50+) sexual offenders in the criminal justice system (Static-99R and Static-2002R; Helmus, Thornton, Hanson, & Babchishin, in press).

Consistent with past research, we expected Aboriginal sex offenders to score significantly higher on the Static scales' total scores and individual items assessing general criminality. In contrast, we expected Aboriginal sex offenders to score lower on items indicative of sexual deviancy. Based on our previous study, we expected items assessing general criminality to be less predictive for Aboriginal sex offenders, but total scores and items assessing sexual deviancy to be equally predictive of sexual recidivism for Aboriginal and non-Aboriginal sex offenders.

Method

Samples

The current study used Static-99/R data of 319 Aboriginal and 1,269 non-Aboriginal sex offenders from five independent Canadian samples (Boer, 2003; Bonta & Yessine, 2005; Haag, 2005; Hanson, Harris, Scott, & Helmus, 2007; Nicholaichuk, 2001). Static-2002/R data were available for 209 Aboriginals and 955 non-Aboriginals from three independent samples (Boer, 2003; Haag, 2005; Hanson et al. 2007). These samples were part of a larger project of renorming Static-99 (Helmus, 2009). The authors of the original studies were contacted for permission to use their dataset for the current study and all agreed. The number of participants in these samples is smaller than previously reported (e.g., Helmus,

2009) because age at release was required to code the new Static-99R and Static-2002R age weights, and Aboriginal status was required to create the grouping variable. Samples differed in how sexual recidivism information was coded. All used official criminal records, but four samples used convictions as the recidivism criteria and one sample (Hanson et al., 2007) used charges. There were slight differences between samples on the definition of sexual recidivism (e.g., some samples did not consider non-contact offences). The excluded offences were low frequency offences at the time and, hence, are expected to make little difference in the overall rates of sexual recidivism. Unless otherwise specified, sexual recidivism would have included all Criminal Code offences generally considered sexual in nature (e.g., sexual interference, invitation to sexual touching, sexual assault).

Boer, 2003. The study examined all male federal offenders serving a sentence for a sexual offence in British Columbia whose Warrant Expiry Date (WED; the end of their sentence) was between January 1990 and May 1994. Many offenders are granted conditional release prior to their WED; thus, offenders in this sample were released as early as 1976. Category B sexual offences (e.g., non-contact sex offences, see Harris, Phenix, Hanson, & Thornton, 2003 for full description) were excluded from the definition of sexual recidivism.

Bonta & Yessine, 2005. The original sample included three subgroups of Canadian offenders: 1) offenders flagged as potential Dangerous Offenders (subject to indeterminate sentence) by the National Flagging System, 2) offenders designated as Dangerous Offenders, and 3) offenders who committed a violent reoffence after being detained until their Warrant Expiry Date. Only offenders in the first group (flagged offenders), however, had Static-99 scores available. Twenty-two cases in which the most recent sex offence(s) was more than two years prior to the current offence for which the offender was flagged were removed because Static-99 has not been tested for offenders without a recent sexual offence. The definition of sexual recidivism excluded prostitution offences, indecent phone calls, and possession of child pornography.

Haag, 2005. The original study sample included all male Canadian federal sex offenders whose Warrant Expiry Date was in 1995, although 75% of offenders were released prior to their WED. Sufficient recidivism information, however, was only available for offenders who were detained until Warrant Expiry (because of a statutory presumption of early release, detention only occurs if the parole board is satisfied that the offender poses an unusually high risk to violently reoffend).

Hanson, Harris, Scott, & Helmus, 2007. This prospective study followed offenders on community supervision between 2001-2005 in Canada, Alaska, and Iowa, although only Canadian offenders were used in the current study. Static-99 scores were coded by the supervision officers as part of routine case management, whereas Static-2002 scores and the new age item for Static-99R and Static-2002R were coded by research assistants from file information. Sexual recidivism was defined as all new crimes with a sexual motivation, whether or not the name of the offence was explicitly sexual. Note that this is the same sample used in our previous study of the STABLE-2007 (Helmus, Babchishin et al., 2011).

Nicholaichuk, 2001. The study examined sex offenders treated at the Clearwater sex offender treatment program, located in a federal maximum-security forensic mental health facility in Saskatchewan.

Measures

Static-99 and Static-99R. Static-99/R are 10-item actuarial measures assessing recidivism risk of adult male sexual offenders. The items and scoring rules of Static-99R are identical to Static-99 (Hanson & Thornton, 2000) with the exception of updated age weights (see Helmus et al., in press). In both scales, higher scores indicate greater risk of recidivism. A recent meta-analysis found a moderate relationship between Static-99R and sexual recidivism (AUC = .69, 95% CI = .66 to .72, $k = 22$, $n = 8,033$; Helmus, Hanson, Thornton, Babchishin, & Harris, 2011). Similarly, there is a moderate relationship between Static-99 and sexual recidivism ($d = 0.67$, 95% CI = 0.62 to 0.72, $N = 20,010$, $k = 63$; which translates to an AUC of .68, 95% CI = .67 to .70; Hanson & Morton-Bourgon, 2009).

Static-2002 and Static-2002R. Static-2002/R are 14-item actuarial measures assessing recidivism risk of adult male sexual offenders. The items and scoring rules of Static-2002R are identical to Static-2002 (Hanson & Thornton, 2003) with the exception of updated age weights (see Helmus et al., in press). Static-2002 (Hanson & Thornton, 2003) was created with the aim of improving Static-99. Important differences between Static-99 and Static-2002 are that Static-2002 added and altered some items, organized items into meaningful subscales to aid interpretation, and has more standardized coding rules. Static-2002R has five subscales: age (one item), persistence of sex offending (three items), deviant sexual interests (three items), relationship to victims (two items), and general criminality (five items). In both scales, higher scores indicate greater risk of recidivism. A recent meta-analysis found a moderate relationship between Static-2002R and sexual recidivism (AUC = .70, 95% CI = .64 to .75, $k = 7$, $n = 2,609$; Babchishin, Hanson, & Helmus, 2011). Similarly, Static-2002 has a moderate relationship with sexual recidivism ($d = 0.70$, 95% CI = 0.59 to 0.81, $N = 3,330$, $k = 8$; which translates to an AUC of .69, 95% CI = .66 to .72; Hanson & Morton-Bourgon, 2009). Previous research found that Static-2002 was significantly more predictive of sexual, violent, and any recidivism than Static-99 (Hanson, Helmus, & Thornton, 2010). In contrast, Static-99R and Static-200R were not found to be significantly different in predictive accuracy for sexual recidivism (Babchishin et al., 2011).

Overview of Analyses

To examine differences between Aboriginal and non-Aboriginal sex offenders on the individual items and total scores of Static-99/R and Static-2002/R, we conducted a series of AUC analyses. The Area Under the Receiver Operating Characteristic Curve (AUC, which can vary between 0 and 1) can be interpreted as the probability that a randomly selected Aboriginal will have a higher risk score than a randomly selected non-Aboriginal. Roughly, an AUC of .56 corresponds to a small effect size, while .64 reflects a moderate effect, and .71 reflects a large effect size (Rice & Harris, 2005). An AUC value is statistically significant

if the 95% confidence interval does not include .50. Although AUCs are most commonly used to predict dichotomous outcome variables (e.g., recidivism), they can also be used to examine differences on a dichotomous grouping variable (e.g., do risk scores predict Aboriginal status?). Group differences could also be examined using *t* tests, but *t* tests assume interval data, and the risk scales are technically ordinal; in contrast, AUCs are appropriate for ordinal data. Additionally, AUCs are an effect size statistic (whereas *t* only tests significance). AUCs provide a slightly more conservative test, although in the current paper, analyses were run both ways and no differences were identified as significant in one analysis but not the other.

AUC analyses were also used to examine the predictive accuracy of the individual items and total scores of the Static scales for Aboriginals and non-Aboriginals separately for each sample. In this case, the AUC can be interpreted as the probability that a randomly selected sexual recidivist will have a higher risk score than a randomly selected non-recidivist. Of note, some items on Static-99/R and Static-2002/R are dichotomous whereas others are ordinal. The Statistical Package for the Social Sciences 17.0 uses the trapezoidal rule to conduct AUC analyses. This method has been found to underestimate AUC values when used on dichotomous data (e.g., Vida, 1993). Nevertheless, AUCs were used for all items and total scores to allow for comparisons of the effect sizes across items. AUC analyses have been recommended by Blanton and Jaccard (2006) as a robust statistic unlikely to be distorted by outliers and the arbitrary effect of scaling.

AUC values were aggregated using both fixed-effect and random-effects meta-analyses (Hedges & Vevea, 1998). Unlike random-effects analyses, fixed-effect analyses have the advantage of providing an estimate of between-study variability (Q) which can be used to compare the variability across levels of a moderator variable (Hedges & Olkin, 1985). In random-effects meta-analysis, the between-study variability is included in the error term, yielding wider (and often more realistic) confidence intervals (Schmidt, Oh, & Hayes, 2009). The results of the random-effects and fixed-effect models converge as the

amount of between-study variability decreases. Although several methods to compute fixed-effect and random-effects estimates of the AUCs and standard errors are available, we used the formulae and procedures recommended by Hedges (1994) and Hedges and Vevea (1998), respectively.

The Q statistic was used to examine the extent to which Aboriginal status was a significant moderator of the predictive accuracy of the scales. Specifically, the overall Q statistic was partitioned into variability across samples that could be explained by the moderator (between-level variability, which will be referred to as between-level Q), and unexplained variability within each level of the moderator (within-level variability, which will be referred to as Q). A significant between-level Q statistic indicates that the moderator variable (Aboriginal versus non-Aboriginal) explains a significant portion of the variability across samples. The Q statistic is distributed as a chi-square, with $x - 1$ degrees of freedom (x = the number of levels of a moderator, which in this case is 2: Aboriginals versus non-Aboriginals). The analysis of the between-level Q statistic provides a more powerful test of differences between groups ($p \leq .05$) than examining the overlapping 95% confidence intervals ($p \leq .01$, Cumming & Finch, 2005).

Results

Table 1 provides descriptive information for each sample. The samples were relatively diverse, with three samples from settings that disproportionately selected high-risk offenders (Bonta & Yessine, 2005; Haag, 2005; Nicholaichuk, 2001), one relatively unselected sample from federal prison (custodial sentences of two or more years; Boer, 2003), and one relatively unselected sample from community supervision (Hanson et al., 2007). Offenders were released between 1976 and 2005, although most offenders were released after 1990. The average length of follow-up was similar for Aboriginal and non-Aboriginal sex offenders, $t = 0.38$, $p = .70$, $N = 1,588$. Aboriginal sex offenders, however, were significantly younger than non-Aboriginals, $t = 3.84$, $p < .001$, $n = 1,588$. The

absolute recidivism rates were not significantly different between groups¹, $\text{Exp}(B) = 1.27$, $\text{Wald} = 2.18$, $p = .14$, $N = 1,587$. Information on type of offender (rapist versus child molester) was available in all but one study (Bonta & Yessine, 2005). The proportion of rapists was significantly higher for Aboriginal sex offenders (60.7% of 257) compared to non-Aboriginal sex offenders (45.8% of 1,019; $\chi^2 = 18.16$, $df = 1$, $p < .001$).

“Insert Table 1 about here”

Mean Differences

Static-99/R. Table 2 presents the item frequencies and the mean and standard deviation of Static-99/R total scores separately for Aboriginal and non-Aboriginal sex offenders, as well as the AUCs comparing the two groups. Higher AUCs (above .50) indicate higher risk scores for Aboriginal versus non-Aboriginal sex offenders whereas lower AUCs (below .50) indicate the opposite. Aboriginal sex offenders differed significantly from non-Aboriginal sex offenders on the total score of original and revised Static-99 and on four out of nine of their shared items. Specifically, Aboriginal sex offenders had significantly more prior non-sexual violence and sentencing dates, were significantly less likely to have male victims and non-contact sex offences, and had higher Static-99/R total scores than non-Aboriginal sex offenders. Offenders were significantly younger on the age item of the Static-99R, but not the Static-99 (dichotomous item).

“Insert Table 2 about here”

¹ To examine the extent to which the groups differed in absolute recidivism rates, we conducted Cox regression analysis, with each sample used as strata to allow separate baseline hazard functions (i.e., recidivism rates) for each sample.

Static-2002/R. Table 3 presents the item frequencies as well as the mean and standard deviation of Static-2002/R total scores separately for Aboriginal and non-Aboriginal sex offenders, and the AUCs comparing the two groups. Aboriginal sex offenders differed significantly from non-Aboriginal sex offenders on 7 out of 13 common Static-2002/R items. Specifically, Aboriginals had significantly higher scores on each item of the general criminality subscale than non-Aboriginals. Aboriginal sex offenders were also significantly less likely to have male victims and non-contact sex offences (two of three items on the deviant sexual interest subscale) than non-Aboriginal sex offenders. Offenders were significantly younger on the age item of the Static-2002 and Static-2002R. Lastly, Aboriginal sex offenders had significantly higher total scores on the original and revised Static-2002 total scores compared to non-Aboriginal sex offenders.

“Insert Table 3 about here”

In summary, Aboriginal sex offenders tended to have higher scores on Static-99/R and Static-2002/R items sampling criminal history and lower scores on items sampling from sexual deviancy compared to their non-Aboriginal counterparts. Static-99/R and Static-2002/R total scores were significantly higher for Aboriginal than for non-Aboriginal offenders.

Predictive Accuracy

Static-99/R. Table 4 presents the meta-analyzed weighted AUC values for Static-99/R items and total scores. In the fixed-effect analyses, AUC values for the items ranged between .498 and .656 for Aboriginal offenders, with statistically significant predictive accuracy for four items (ever lived with a lover for two or more years, index non-sexual violence, prior sex offences, and prior sentencing dates). In the random-effects analyses, only one item was significant: prior sex offences. Static-99R total scores (for both fixed-effect and random-effects, AUC = .713, 95% CI = .639 to .787) and Static-99 total scores

(for both fixed-effect and random-effects, $AUC = .698$, 95% CI = .624 to .772) significantly predicted sexual recidivism for Aboriginal offenders. Of interest, the within-level Q statistics (indicating between-sample variability) were non-significant for the total score and all but one item (ever lived with a lover for two or more years), indicating that the findings were consistent across the five samples included in the meta-analysis.

“Insert Table 4 about here”

Only three Static-99/R items had higher predictive accuracy for Aboriginal sex offenders than for non-Aboriginal sex offenders. Moderator analyses utilizing the between-level Cochrane’s Q statistic did not identify any items in which Aboriginal status accounted for a significant amount of variability, although the item for stranger victim approached significance (between-level $Q = 3.71$, $p = .054$), with lower accuracy found for the Aboriginal offenders. The predictive accuracy of the Static-99R total score was also not significantly different between Aboriginal and non-Aboriginal sex offenders (M weighted AUC, from both fixed-effect and random-effects, for Aboriginal offenders = .713, 95% CI = .639 to .787; for non-Aboriginal offenders, M weighted AUC = .736, 95% CI = .695 to .778; between-level $Q = 0.29$, $p = .590$). Consistent with the findings of the Static-99R, the original Static-99 total score was not significantly different between Aboriginal and non-Aboriginal sex offenders (M weighted AUC for Aboriginal offenders, from both fixed-effect and random-effects = .698, 95% CI = .624 to .772; for non-Aboriginal offenders, M weighted AUC from random-effects = .719, 95% CI = .662 to .775; between-level $Q = 0.40$, $p = .527$).

Our previous study (Helmus, Babchishin et al., 2011) using the Hanson et al. (2007) sample found marked differences between Aboriginals and non-Aboriginals on the STABLE-2007. As such, we removed the Hanson et al. (2007) sample from our analyses to examine whether our findings would be the same. Removing the Hanson et al. (2007) sample

resulted in remarkably similar results (table available upon request). In addition, we restricted the analyses to the three samples which also had Static-2002/R scores to provide a better comparison of the static scales (see Appendix). The moderator analyses for the items stranger victim (between-level $Q = 3.99, p = .046$) and ever lived with a lover (between-level $Q = 5.56, p = .018$) were now significant; the item stranger victim had lower predictive accuracy for Aboriginals whereas the item ever lived with a lover had higher predictive accuracy for Aboriginals. The predictive accuracy of the Static-99/R total scores continued to be uninfluenced by Aboriginal status.

Static-2002/R. Table 5 presents the weighted AUC values for Static-2002/R items and total scores. Note that the sample size of Aboriginal sex offenders was reduced to 209 (from 319 for Static-99/R analyses), reducing the statistical power. In the fixed-effect analyses, AUC values for the Static-2002/R items ranged between .489 and .623 for Aboriginal offenders, with statistically significant predictive accuracy for only one item (prior sentencing occasions for sexual offences; in both fixed- and random-effects analyses). The predictive accuracy of Static-2002R approached statistical significance for Aboriginal offenders (for both fixed-effect and random-effects, $AUC = .608$, 95% CI of .499 to .718) and was significant for Static-2002 (for both fixed-effect and random-effects, $AUC = .617$, 95% CI = .507 to .727). Similar to Static-99R findings, within-level Q statistics (indicating variability between samples) were non-significant for most items as well as the total scores, indicating that the findings were generally consistent across the three samples included in the meta-analysis.

“Insert Table 5 about here”

All items of Static-2002/R had greater predictive accuracy for non-Aboriginals than for Aboriginals. Moderator analyses identified two items with significantly lower predictive accuracy for Aboriginal offenders: stranger victim ($Q = 3.84, p = .05$) and any community

supervision violation ($Q = 7.85, p < .001$). The item years free prior to index offence approached significance (between-level $Q = 3.77, p = .052$), with lower accuracy found for Aboriginals. Additionally, the relationship to victims subscale (which consists of two items: any unrelated victim and any stranger victim) also had significantly lower accuracy for Aboriginal sex offenders, $Q = 4.54, p = .033$.

For Static-2002R total scores, Aboriginal status significantly moderated the predictive accuracy, with lower predictive accuracy among Aboriginal sex offenders than non-Aboriginal sex offenders (M weighted AUC for Aboriginal offenders = .608, 95% CI = .499 to .718; for non-Aboriginal offenders, M weighted AUC = .759, 95% CI = .709 to .809, between-level $Q = 6.02, p = .014$). The original Static-2002 total score also had significantly lower predictive accuracy among Aboriginal sex offenders than non-Aboriginal sex offenders (M weighted AUC for Aboriginal offenders, from both fixed-effect and random-effects = .617, 95% CI = .507 to .727; M weighted AUC for non-Aboriginal offenders, from both fixed-effect and random-effects = .763, 95% CI of .716 to .811, between-level $Q = 5.75, p = .016$). These findings are surprising considering we found few differences between groups in the predictive accuracy of Static-99/R, even when the data were restricted to the same three samples. Removing the Hanson et al. (2007) sample utilized in our previous study (Helmus, Babchishin, et al., 2011) did not substantively alter the results (table available upon request).

Table 6 presents the AUCs for the total scores of the Static scales separated by sample. Each of the three samples with Static-99/R and Static-2002/R data consistently found larger differences in predictive accuracy between Aboriginal and non-Aboriginal sex offenders on Static-2002/R and smaller differences between groups on Static-99/R. Additionally, all samples found lower predictive accuracy for Static-2002/R for Aboriginal offenders compared to non-Aboriginals, whereas for Static-99/R, some samples found higher predictive accuracy for Aboriginal offenders and others found higher accuracy for non-Aboriginals.

“Insert Table 6 about here”

Supplementary Analyses

It is possible that differences in item weighting have made Static-2002/R less predictive than Static-99/R for Aboriginal sex offenders. Namely, Static-2002/R have more general criminality items than Static-99/R. To further explore this interpretation, we created subscales from Static-99/R and Static-2002/R to represent the two major domains measured in the scales: sexual deviance and general antisociality. The age at release items were excluded from the scales because age is considered a separate domain (e.g., Barbaree, Langton, Blanchard, & Cantor, 2009). The items in the sexual deviance subscale of the Static-99 scales (same for both the original and revised Static-99) were prior sex offences, non-contact sex offences, unrelated victims, stranger victims, and male victims. The antisociality subscale (same for both the original and revised Static-99) included ever lived with a lover, index non-sexual violence, prior non-sexual violence, and prior sentencing occasions. The ever lived with a lover item was classified with the antisociality items, consistent with the factor analysis conducted by Barbaree and colleagues (2009). The subscale scores of persistence of sexual offending, deviant sexual interests, and relationship to victims were combined to form the sexual deviance subscale (same for both the original and revised Static-2002). Lastly, the general criminality subscale (same for both the original and revised Static-2002) comprised the antisociality subscale for the Static-2002 scales. The sexual deviance subscales from Static-99 scales and Static-2002 scales were more highly correlated ($r = .92, p < .001$) than the antisociality subscales ($r = .73, p < .001$), which supports the hypothesis that the diverging findings for Static-99/R versus Static-2002/R are likely coming from the antisociality domain rather than the sexual deviance domain (similar correlations between subscales were found when the sample was separated by Aboriginal status).

Discussion

The current study examined the extent to which Aboriginal and non-Aboriginal sex offenders differed on the presence of static risk factors and how well the Static items and total scores predicted sexual recidivism. Consistent with past findings, Aboriginal sex offenders tended to score higher on items corresponding to general criminality (e.g., prior sentencing dates) and were younger than non-Aboriginal sex offenders. This makes sense given that the Aboriginal group contained a greater proportion of rapists, who tend to exhibit more general criminality and antisociality than child molesters (Firestone, Bradford, Greenberg, & Serran, 2000; Harris, Smallbone, Dennison, & Knight, 2009; Lussier, Proulx, & Leblanc, 2005). Aboriginal sex offenders, however, were found to score lower on items indicative of sexual deviancy (e.g., male victims) than non-Aboriginal sex offenders, which is consistent with previous research on Aboriginal sex offenders (e.g., Ellerby & MacPherson, 2002). Despite Aboriginals scoring higher on Static-99/R than non-Aboriginals, the predictive accuracy of the total scores and the individual items were not significantly different between the groups (with the possible exception of stranger victims and ever lived with a lover, which were significant in a subset of the analyses).

These results were only partly replicated for Static-2002/R. Specifically, Aboriginal sex offenders scored significantly higher than non-Aboriginal sex offenders for the general criminality items and had higher total scores. In contrast to Static-99/R findings, the predictive accuracy of Static-2002/R total scores and individual items tended to be lower for Aboriginal sex offenders. Specifically, this pattern reached significance for Static-2002/R total scores and the items stranger victims and community supervision violations, and approached significance for the item years free prior to index offence. Exploratory analyses (not reported but available upon request) suggested that these differences were not attributable to the differing proportions of rapists and child molesters (i.e., predictive accuracy was lower for Aboriginals compared to non-Aboriginals within both offender types). Although only two items of the Static-2002/R had significantly lower predictive accuracy for Aboriginal offenders, these results should be interpreted with caution given the smaller

sample size of Aboriginal offenders, reducing the power of these analyses. Nonetheless, the significant differences in predictive accuracy between the two groups is concerning.

The divergent findings between Static-99/R and Static-2002/R are surprising given that the scales are composed of similar and sometimes identical items and, consequently, are highly correlated to one another (in the current samples, revised scales: $r = .92$, $p < .001$, $n = 1,164$; original scales: $r = .86$, $p < .001$, $n = 1,164$). Despite Static-2002/R analyses utilizing a smaller sample size than Static-99/R analyses, significant differences in predictive accuracy were found (suggesting adequate statistical power). At the sample level, the within-level Q statistics tended to be non-significant, indicating that individual samples found consistent predictive accuracy. In addition, restricting the Static-99/R analyses to the three samples with Static-2002/R data or removing the Hanson et al. (2007) sample from the Static-99/R and Static-2002/R analyses (the sample used in Helmus, Babchishin et al., 2011), resulted in remarkably similar findings (though larger confidence intervals due to the smaller sample size). In summary, the differences between the groups in the predictive accuracy of Static-2002/R are not due to a single outlying sample.

Instead, it is possible that subtle differences in item coding have made the original and revised Static-2002 scales less predictive than Static-99/R for Aboriginal sex offenders. Static-2002/R, for example, have more general criminality items than Static-99/R, which Aboriginal offenders tend to score higher on (Dell & Boe, 2000; Helmus, Babchishin et al., 2011; Holsinger et al., 2003) and which may be less predictive for this group (e.g., Helmus, Babchishin et al., 2011). This study found that the sexual deviance subscales from Static-99/R and Static-2002/R were more highly correlated than the antisociality subscales, which suggests that diverging findings for Static-99/R versus Static-2002/R are likely attributable to the antisociality domain rather than the sexual deviance domain.

It is possible that underlying propensities are expressed differently by Aboriginal and non-Aboriginal offenders due to social, economic, and cultural differences. Relatedly, it is possible that the risk factors measured in Static-2002/R are not assessing the same

underlying construct for Aboriginal and non-Aboriginal offenders (or are not adequately measuring the constructs of interest for Aboriginal offenders). Perhaps for Aboriginal sex offenders, some of the items included in the general criminality subscales (e.g., community violations) are indicators of something other than criminality (e.g., cultural marginalization, poverty). The divergent findings between the Static-99/R and Static-2002/R scales suggest that the criminality items of Static-99/R may actually be better markers of general antisociality (or at the very least better predictors of sexual recidivism) for Aboriginal sex offenders than the updated criminality items of Static-2002/R. Future research needs to explore construct validity of the propensities related to crime and identify items that may be better indicators of these propensities for Aboriginals than the current Static-2002/R items. Additionally, research is needed to identify and replicate risk factors that are predictive within this population, examining both generally supported risk factors such as the central 8 (Andrews & Bonta, 2010) and exploring the possibility of risk factors unique to Aboriginal offenders, such as a lack of cultural identity (Department of Corrections, 2001).

We also considered the possibility that the differences in accuracy between groups were a statistical artefact, but this did not seem to be the case. The AUC statistic is influenced by the distribution of the predictor (e.g., presence of a stranger victim). Specifically, restriction of range (typically when most offenders score low) on the predictor reduces AUC values. In this study, we found that the range of responses on individual items tended to be larger for Aboriginals than non-Aboriginals. If restriction of range was an issue, we would also expect smaller effect sizes if there were smaller standard deviations in the predictor (i.e., items or total scores). The difference in standard deviations between Aboriginals and non-Aboriginals for the total score of Static-2002R, for example, was in the direction associated with the observed effect, however, was too small to account for the differences in predictive accuracy (e.g., $SD = 2.63$ for Static-2002R total scores of the overall sample, $SD = 2.28$ for Aboriginals, $SD = 2.66$ for non-Aboriginals).

Similar to previous studies, the current study found that Aboriginal sex offenders tend to be younger (Olver & Wong, 2006; Rastin & Johnson, 2002), have longer criminal histories (Ellerby & MacPherson, 2002; Olver & Wong, 2006), and are less likely to have male victims (e.g., Ellerby & MacPherson, 2002; Nahanee, 1996; Rastin & Johnson, 2002; Rojas & Gretton, 2007). Aboriginal and non-Aboriginal sex offenders were similar on the item ever lived with a lover for at least two years. Consistent with Nicholaichuk's (2001) finding on Static-99, the present study (with a larger sample size) found that the original and revised version of Static-99 are equally applicable to Aboriginal and non-Aboriginal sex offenders. To date, no study has examined the extent to which the Static-2002 or Static-2002R are applicable to Aboriginal sex offenders. We assumed Aboriginal status would not affect predictive accuracy for the Static-2002/R or Static-99/R. Instead, the current study found significant group differences in the predictive accuracy of the original and revised version of Static-2002.

The current study only examined differences in the relative predictive accuracy of the instruments (i.e., were offenders with higher scores on the static scales more likely to reoffend than offenders with lower scores on the static scales). Although examining estimates of relative risk (e.g., AUC) provides useful information, an additionally important avenue for research on Aboriginal offenders includes examining differences in absolute recidivism rates and examining absolute predictive accuracy. That is, are there differences in absolute recidivism rates between Aboriginal and non-Aboriginal sex offenders? If there are observed differences, are they explained by differences in risk levels? To what extent do the predicted recidivism rates generated by the risk scales correspond to the observed recidivism rates of Aboriginal offenders? There are effect size statistics available to examine the fit between the predicted and observed recidivism rates independent of relative predictive accuracy (e.g., Helmus et al., in press). Even though the relative predictive accuracy (AUCs) for Static-99/R were similar for Aboriginal and non-Aboriginal offenders, it

is possible that the predicted recidivism rates might underestimate recidivism for Aboriginal offenders.

Implications for Researchers

The results of the present study have clear implications for the future direction of research on the applicability of risk assessment tools for Aboriginal offenders. Firstly, research should explore the extent to which Aboriginal status moderates the predictive accuracy of other risk scales designed to assess sexual recidivism. Presumably, our findings are not restricted to the original and revised Static-99 and Static-2002 scales. Given that Aboriginals are not a homogenous group, research should also focus on exploring the applicability of risk assessment tools across Aboriginal groups (e.g., Aboriginals living on/off reserve). There is some evidence that the LSI:R may be less predictive of recidivism for Native American offenders in the United States (Holsinger et al., 2006), suggesting that there may be important differences across Aboriginal groups and countries (Mihailides, Jude, & Van den Bossche, 2005).

Additionally, although a major strength of this study was that results were compared across multiple diverse samples, which increases the generalizability of the findings, the sample size of Aboriginal offenders was still less than ideal. Further research replicating the findings is needed, particularly for the original and revised version of the Static-2002, given that only three of the samples had Static-2002/R scores available.

Implications for Risk Evaluators

The current study supports Static-99/R as predictors of relative risk for sexual recidivism among Aboriginal and non-Aboriginal sex offenders. In contrast, Static-2002/R had significantly lower predictive accuracy for Aboriginal sex offenders, although the AUCs for Aboriginal offenders either approached or reached statistical significance. Evaluators should be cautious about using Static-2002/R, although more research is required before we can confidently conclude that Static-2002/R are inappropriate for Aboriginal sex offenders.

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Table 1

Descriptive Information of the Samples

Study	Release Period	Aboriginals				Non-Aboriginals			
		<i>n</i>	Follow-up (SD)	Sexual Recidivism % (<i>n</i>)	Age (SD)	<i>n</i>	Follow-up (SD)	Sexual Recidivism % (<i>n</i>)	Age (SD)
Boer (2003)	1976-1994	56	12.9 (2.1)	7.1 (4)	39.0 (12.7)	228	13.3 (2.1)	9.2 (21)	42.0 (12.4)
Bonta & Yessine (2005)	1992-2004	26	5.0 (2.0)	30.8 (8)	36.9 (6.9)	107	5.7 (2.4)	12.1 (13)	40.5 (10.1)
Haag (2005)	1995	50	7.0 (0.0)	30.0 (15)	33.7 (8.7)	146	7.0 (0.0)	24.0 (35)	38.3 (10.1)
Hanson et al. (2007)	2001-2005	106	3.7 (1.0)	10.4 (11)	36.3 (10.3)	588	3.4 (1.0)	7.8 (46)	42.5 (13.5)
Nicholaichuk (2001)	1983-1998	81	5.4 (3.8)	16.0 (13)	32.9 (8.5)	200	6.7 (4.0)	19.5 (39)	35.6 (9.7)
Total	1976-2005	319	6.4 (3.9)	16.0 (51)	35.6 (10.1)	1,269	6.3 (4.2)	12.1 (154)	40.7 (12.4)

Note. Follow-up period is reported in years. Sexual recidivism rates from all cases, not controlling for length of follow-up reported.

Table 2

Differences in Static-99/R Item and Total Scores between Aboriginal and Non-Aboriginal Sex Offenders

	Aboriginal		Non-Aboriginal		AUC	95% CI	
	%	(n)	%	(n)		LL	UL
Ever lived with lover for 2+ years					.505	.469	.540
0 (yes)	66.1	(211)	67.1	(852)			
1 (no)	33.9	(108)	32.9	(417)			
Index non-sexual violence					.511	.476	.547
0 (no)	79.9	(255)	82.2	(1,043)			
1 (yes)	20.1	(64)	17.8	(226)			
Prior non-sexual violence					.635*	.601	.670
0 (no)	39.5	(126)	66.6	(845)			
1 (yes)	60.5	(193)	33.4	(424)			
Prior sex offences					.514	.479	.548
0 (none)	50.5	(161)	56.2	(713)			
1 (1-2 charges or 1 conviction)	27.6	(88)	19.7	(250)			
2 (3-5 charges or 2-3 convictions)	15.4	(49)	13.8	(175)			
3 (6+ charges or 4+ convictions)	6.6	(21)	10.3	(131)			
Prior sentencing dates					.631*	.597	.665
0 (3 or less)	37.0	(118)	63.2	(802)			
1 (4+)	63.0	(201)	36.8	(467)			
Non-contact sex convictions					.454^{*a}	.421	.488
0 (no)	96.6	(308)	87.4	(1,109)			
1 (yes)	3.4	(11)	12.6	(160)			
Any unrelated victims					.500	.465	.536
0 (no)	24.5	(78)	24.5	(311)			
1 (yes)	75.5	(241)	75.5	(958)			
Any stranger victims					.511	.476	.547
0 (no)	63.9	(204)	66.2	(840)			
1 (yes)	36.1	(115)	33.8	(429)			
Any male victims					.433^{*a}	.400	.466
0 (no)	93.1	(297)	79.7	(1,012)			
1 (yes)	6.9	(22)	20.3	(257)			

(continued)

Table 2. Continued

	Aboriginal		Non-Aboriginal		AUC	95% CI	
	%	(n)	%	(n)		LL	UL
Age at release (Static-99R)					.623*	.590	.657
1 (aged 18 to 34.9)	56.7	(181)	35.4	(449)			
0 (aged 35 to 39.9)	15.0	(48)	17.6	(223)			
-1 (aged 40 to 59.9)	25.7	(82)	38.7	(491)			
-3 (aged 60 or older)	2.5	(8)	8.4	(106)			
Age at release (Static-99)					.517	.481	.553
0 (aged 25 or older)	87.1	(278)	90.6	(1,150)			
1 (aged 18 to 24.9)	12.9	(41)	9.4	(119)			
Total Static-99R Scores	4.01	2.32	3.13	2.73	.600*	.567	.632
Total Static-99 Scores	3.90	1.96	3.51	2.29	.562*	.529	.595

Note. AUC = area under the curve; CI = confidence interval. LL = lower limit; UL = upper limit. Larger AUC indicate higher scores for Aboriginal compared to non-Aboriginal sex offenders. The mean and standard deviation presented for the total scores.

^aIndicates significantly ($p < .05$) lower scores for Aboriginals versus Non-aboriginal offenders.

* $p < .05$.

Table 3

Differences in Static-2002/R Item and Total Scores between Aboriginal and Non-Aboriginal Sex Offenders

	Aboriginal		Non-Aboriginal		AUC	95% CI	
	%	(n)	%	(n)		LL	UL
Age at release (Static-2002R)					.629*	.588	.669
-2 (aged 60 or older)	3.3	(7)	10.2	(97)			
0 (aged 40 to 59.9)	26.8	(56)	40.0	(382)			
1 (aged 35 to 39.9)	16.3	(34)	17.8	(170)			
2 (aged 18 to 34.9)	53.6	(112)	32.0	(306)			
Age at release (Static-2002)					.617*	.576	.658
0 (aged 50 or older)	7.8	(25)	17.7	(224)			
1 (aged 35 to 49.9)	22.6	(72)	33.5	(425)			
2 (aged 25 to 34.9)	27.0	(86)	17.3	(219)			
3 (aged 18 to 24.9)	8.2	(26)	6.9	(87)			
<u>PERSISTENCE OF SEXUAL OFFENDING</u>					.519	.475	.562
0 (subtotal = 0)	69.9	(146)	73.1	(698)			
1 (subtotal = 1)	14.8	(31)	15.5	(148)			
2 (subtotal = 2-3)	14.4	(30)	9.3	(89)			
3 (subtotal = 4-5)	1.0	(2)	2.1	(20)			
Prior sentencing occasions for sex offences					.510	.467	.553
0 (none)	70.3	(147)	73.1	(698)			
1 (1)	22.0	(46)	17.6	(168)			
2 (2-3)	7.2	(15)	8.0	(76)			
3 (4 or more)	0.5	(1)	1.4	(13)			
Any juvenile sexual arrests					.508	.464	.551
0 (no)	96.7	(202)	98.2	(938)			
1 (yes)	3.3	(7)	1.8	(17)			
Rate of sexual offending					.522	.478	.566
0 (< 1 sentencing occasion every 15 years)	86.6	(181)	91.0	(869)			
1 (≥ 1 sentencing occasion every 15 years)	13.4	(28)	9.0	(86)			
<u>DEVIANT SEXUAL INTERESTS</u>					.412*^a	.372	.451
0 (subtotal = 0)	82.3	(172)	65.5	(626)			
1 (subtotal = 1)	14.4	(30)	23.1	(221)			
2 (subtotal = 2)	2.9	(6)	8.9	(85)			
3 (subtotal = 3)	0.5	(1)	2.4	(23)			
Non-contact sex offences					.446*^a	.406	.487
0 (no)	97.1	(203)	86.4	(825)			
1 (yes)	2.9	(6)	13.6	(130)			

(continued)

Table 3. Continued.

	Aboriginal		Non-Aboriginal		AUC	95% CI	
	%	(n)	%	(n)		LL	UL
Any male victim					.439^{*a}	.399	.480
0 (no)	93.3	(195)	81.2	(775)			
1 (yes)	6.7	(14)	18.8	(180)			
Young, unrelated victims					.481	.439	.524
0 (no)	88.8	(184)	84.3	(805)			
1 (yes)	12.0	(25)	15.7	(150)			
<u>RELATIONSHIP TO VICTIMS</u>					.523	.479	.566
0 (subtotal = 0)	26.8	(56)	29.0	(277)			
1 (subtotal = 1)	41.1	(86)	43.1	(412)			
2 (subtotal = 2)	32.1	(67)	27.9	(266)			
Any unrelated victim					.511	.468	.554
0 (no)	26.8	(56)	29.0	(277)			
1 (yes)	73.2	(153)	71.0	(678)			
Any stranger victim					.521	.477	.565
0 (no)	67.9	(142)	72.1	(689)			
1 (yes)	32.1	(67)	27.9	(266)			
<u>GENERAL CRIMINALITY</u>					.687[*]	.648	.725
0 (subtotal = 0)	10.0	(21)	30.4	(290)			
1 (subtotal = 1-2)	16.7	(35)	27.5	(263)			
2 (subtotal = 3-4)	36.8	(77)	26.6	(254)			
3 (subtotal = 5-6)	36.4	(76)	15.5	(148)			
Any prior criminal involvement					.592[*]	.553	.632
0 (no)	12.9	(27)	31.4	(300)			
1 (yes)	87.1	(182)	68.6	(655)			
Prior sentencing occasions					.650[*]	.609	.692
0 (less than 3 prior sentencing occasions)	33.0	(69)	61.6	(588)			
1 (3-13 prior sentencing occasions)	57.4	(120)	35.2	(336)			
2 (14 or more prior sentencing occasions)	9.6	(20)	3.2	(31)			
Community supervision violation					.656[*]	.616	.696
0 (no)	28.7	(60)	59.9	(572)			
1 (yes)	71.3	(149)	40.1	(383)			
Years free prior to Index Sex Offence (ISO)					.610[*]	.567	.652
0 (>36 months prior to committing ISO AND >48 months free prior to ISO conviction)	42.6	(89)	64.5	(616)			
1 (<36 months prior to committing ISO OR <48 months free prior to ISO conviction)	57.4	(120)	35.5	(339)			

(continued)

Table 3. Continued

	Aboriginal		Non-Aboriginal		AUC	95% CI	
	%	(n)	%	(n)		LL	UL
Any prior non-sexual violence					.630*	.587	.673
0 (no)	45.0	(94)	71.0	(678)			
1 (yes)	55.0	(115)	29.0	(277)			
Total Static-2002R Score	4.89	2.28	3.76	2.66	.636*	.597	.675
Total Static-2002 Score	5.27	2.11	4.32	2.47	.627*	.588	.666

Note. ISO: index sex offence; AUC = area under the curve; CI = confidence interval. *LL* = lower limit; *UL* = upper limit. Larger AUC indicate higher scores for Aboriginal compared to non-Aboriginal sex offenders. Static-2002/R subscales indicated in capitals. The mean and standard deviation presented for the total scores.

^aIndicates significantly ($p < .05$) *lower* scores for Aboriginals versus Non-aboriginal offenders.

* $p < .05$.

Table 4

Meta-analyses of the Differences between Groups in Predictive Accuracy of the Static-99/R for Sexual Recidivism

Item	Fixed-effect			Random-effects			k	N	Q
	AUC	95% CI		AUC	95% CI				
		LL	UL		LL	UL			
Age at release (Static-99R)									
Overall	.588*	.547	.628	.588*	.547	.628	10	1,588	6.96
Aboriginal	.542	.459	.626	.542	.459	.626	5	319	3.60
Non-Aboriginal	.601*	.555	.648	.601*	.555	.648	5	1,269	1.89
								Between level Q	1.47
Age at release (Static-99R)									
Overall	.512	.469	.556	.512	.469	.556	10	1,588	1.61
Aboriginal	.512	.422	.603	.512	.422	.603	5	319	1.17
Non-Aboriginal	.512	.462	.563	.512	.462	.563	5	1,269	0.43
								Between level Q	0.01
Lived with a lover for two years									
Overall	.611*	.570	.652	.603*	.536	.670	10	1,588	21.37*
Aboriginal	.650*	.576	.724	.602	.439	.765	5	319	18.21**
Non-Aboriginal	.594*	.544	.643	.594*	.544	.643	5	1,269	1.60
								Between level Q	1.56
Index non-sexual violence									
Overall	.543	.500	.587	.543	.500	.587	10	1,588	8.98
Aboriginal	.589*	.503	.676	.598	.484	.712	5	319	6.70
Non-Aboriginal	.528	.477	.578	.528	.477	.578	5	1,269	0.84
								Between level Q	1.44
Prior non-sexual violence									
Overall	.580*	.536	.623	.580*	.536	.623	10	1,588	5.38
Aboriginal	.558	.472	.644	.558	.472	.644	5	319	1.67
Non-Aboriginal	.587*	.537	.637	.587*	.537	.637	5	1,269	3.39
								Between level Q	0.32
Prior sex offences									
Overall	.650*	.609	.692	.650*	.609	.692	10	1,588	3.78
Aboriginal	.656*	.574	.738	.656*	.574	.738	5	319	0.68
Non-Aboriginal	.649*	.600	.698	.649*	.600	.698	5	1,269	3.09
								Between level Q	0.01

(continued)

Table 4. (continued)

Item	Fixed-effect			Random-effects			<i>k</i>	<i>N</i>	<i>Q</i>
	AUC	95% CI		AUC	95% CI				
		<i>LL</i>	<i>UL</i>		<i>LL</i>	<i>UL</i>			
Prior sentencing dates									
Overall	.601*	.560	.643	.599*	.552	.646	10	1,588	10.82
Aboriginal	.606*	.528	.683	.603	.496	.709	5	319	7.43
Non-Aboriginal	.599*	.550	.648	.599*	.550	.648	5	1,269	3.37
								Between level <i>Q</i>	0.02
Non-contact sex offences									
Overall	.553*	.508	.598	.553*	.508	.598	10	1,588	3.86
Aboriginal	.498	.408	.588	.498	.408	.588	5	319	0.54
Non-Aboriginal	.571*	.519	.624	.571*	.519	.624	5	1,269	1.40
								Between level <i>Q</i>	1.92
Any unrelated victims									
Overall	.582*	.543	.621	.582*	.543	.621	10	1,588	4.23
Aboriginal	.543	.459	.628	.543	.459	.628	5	319	1.74
Non-Aboriginal	.593*	.549	.636	.593*	.549	.636	5	1,269	1.46
								Between level <i>Q</i>	1.03
Any stranger victims									
Overall	.583*	.540	.626	.580*	.532	.627	10	1,588	10.20
Aboriginal	.506	.416	.596	.506	.416	.596	5	319	3.62
Non-Aboriginal	.606*	.557	.656	.606*	.557	.656	5	1,269	2.87
								Between level <i>Q</i>	3.71^a
Any male victims									
Overall	.512	.469	.556	.512	.469	.556	10	1,588	8.45
Aboriginal	.495	.406	.584	.495	.406	.584	5	319	1.17
Non-Aboriginal	.518	.468	.567	.512	.445	.579	5	1,269	7.08
								Between level <i>Q</i>	0.20
Total Static-99R Scores									
Overall	.731*	.694	.767	.731*	.694	.767	10	1,588	7.78
Aboriginal	.713*	.639	.787	.713*	.639	.787	5	319	3.94
Non-Aboriginal	.736*	.695	.778	.736*	.695	.778	5	1,269	3.55
								Between level <i>Q</i>	0.29
Total Static-99 Scores									
Overall	.718*	.680	.756	.718*	.680	.756	10	1,588	8.40
Aboriginal	.698*	.624	.772	.698*	.624	.772	5	319	2.02
Non-Aboriginal	.726*	.682	.770	.719*	.662	.775	5	1,269	5.98
								Between level <i>Q</i>	0.40

Note. AUC = area under the curve; CI = confidence interval. *LL* = lower limit; *UL* = upper limit. The variability (*Q*) within each level of the moderator was subtracted from the overall *Q* statistic, and the remaining *Q* value (between-level *Q*) represents the variability across studies due to the moderator variable (between-level *Q*; tested on a chi-square distribution with 1 as the degrees of freedom).

^a*p* = .054.

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

Table 5
Meta-analyses of the Differences between Groups in Predictive Accuracy of the Static-2002/R for Sexual Recidivism

Item	Fixed-effect			Random-effects			k	N	Q
	AUC	95% CI		AUC	95% CI				
		LL	UL		LL	UL			
Age at release (Static-2002R)									
Overall	.578*	.528	.628	.577*	.523	.631	6	1,164	5.45
Aboriginal	.489	.372	.605	.489	.372	.605	3	209	0.53
Non-Aboriginal	.598*	.542	.654	.598*	.542	.654	3	955	2.15
								Between level Q	2.77
Age at release (Static-2002)									
Overall	.589*	.541	.636	.584*	.515	.652	6	1,164	8.42
Aboriginal	.490	.373	.608	.493	.368	.618	3	209	2.25
Non-Aboriginal	.608*	.556	.563	.613*	.548	.677	3	955	2.96
								Between level Q	3.21
<u>PERSISTENCE OF SEXUAL OFFENDING</u>									
Overall	.639*	.583	.694	.639*	.583	.694	6	1,164	1.31
Aboriginal	.617	.498	.736	.617	.498	.736	3	209	0.45
Non-Aboriginal	.645*	.582	.708	.645*	.582	.708	3	955	0.69
								Between level Q	0.17
Prior sentencing occasions for sex offences									
Overall	.638*	.583	.694	.638*	.583	.694	6	1,164	1.34
Aboriginal	.623*	.502	.743	.623*	.502	.743	3	209	0.32
Non-Aboriginal	.643*	.580	.705	.643*	.580	.705	3	955	0.93
								Between level Q	0.09
Any juvenile sexual arrests									
Overall	.503	.449	.557	.503	.449	.557	6	1,164	0.23
Aboriginal	.499	.383	.616	.499	.383	.616	3	209	0.13
Non-Aboriginal	.504	.443	.565	.504	.443	.565	3	955	0.09
								Between level Q	0.01
Rate of sexual offending									
Overall	.599*	.542	.656	.599*	.542	.656	6	1,164	1.60
Aboriginal	.578	.457	.699	.578	.457	.699	3	209	0.78
Non-Aboriginal	.605*	.540	.670	.605*	.540	.670	3	955	0.67
								Between level Q	0.25
<u>DEVIANT SEXUAL INTERESTS</u>									
Overall	.579*	.523	.634	.579*	.523	.634	6	1,164	2.20
Aboriginal	.529	.409	.649	.529	.409	.649	3	209	0.17
Non-Aboriginal	.592*	.530	.655	.592*	.530	.655	3	955	1.18
								Between level Q	0.85

(continued)

Table 5. (continued)

Item	Fixed-effect			Random-effects			k	N	Q
	AUC	95% CI		AUC	95% CI				
		LL	UL		LL	UL			
Non-contact sex offences									
Overall	.552	.496	.608	.552	.496	.608	6	1,164	2.43
Aboriginal	.499	.381	.617	.499	.381	.617	3	209	0.24
Non-Aboriginal	.567*	.504	.631	.567*	.504	.631	3	955	1.18
								Between level Q	1.01
Any male victim									
Overall	.549	.493	.604	.549	.493	.604	6	1,164	1.76
Aboriginal	.530	.408	.651	.530	.408	.651	3	209	0.44
Non-Aboriginal	.554	.492	.616	.554	.492	.616	3	955	1.20
								Between level Q	0.12
Young, unrelated victims									
Overall	.527	.472	.582	.527	.472	.582	6	1,164	1.92
Aboriginal	.493	.378	.607	.493	.378	.607	3	209	0.67
Non-Aboriginal	.537	.475	.599	.537	.475	.599	3	955	0.81
								Between level Q	0.44
<u>RELATIONSHIP TO VICTIMS</u>									
Overall	.644*	.595	.692	.619*	.542	.696	6	1,164	10.23
Aboriginal	.536	.426	.646	.530	.394	.667	3	209	2.89
Non-Aboriginal	.670*	.616	.724	.665*	.600	.731	3	955	2.80
								Between level Q	4.54*
Any unrelated victim									
Overall	.595*	.548	.643	.595*	.548	.643	6	1,164	2.80
Aboriginal	.542	.432	.653	.542	.432	.653	3	209	1.11
Non-Aboriginal	.607*	.554	.660	.607*	.554	.660	3	955	0.62
								Between level Q	1.07
Any stranger victim									
Overall	.600*	.546	.655	.591*	.524	.658	6	1,164	6.73
Aboriginal	.495	.377	.613	.495	.377	.613	3	209	1.35
Non-Aboriginal	.628*	.567	.690	.628*	.567	.690	3	955	1.54
								Between level Q	3.84*
<u>GENERAL CRIMINALITY</u>									
Overall	.650*	.600	.701	.632*	.552	.713	6	1,164	10.48
Aboriginal	.554	.435	.674	.554	.435	.674	3	209	1.91
Non-Aboriginal	.671*	.616	.727	.666*	.572	.760	3	955	5.54
								Between level Q	3.03

(continued)

Table 5. (continued)

Item	Fixed-effect			Random-effects			k	N	Q
	AUC	95% CI		AUC	95% CI				
		LL	UL		LL	UL			
Any prior criminal involvement									
Overall	.582*	.533	.631	.582*	.533	.631	6	1,164	3.81
Aboriginal	.503	.388	.619	.503	.388	.619	3	209	0.55
Non-Aboriginal	.599*	.545	.653	.599*	.545	.653	3	955	1.11
								Between level Q	2.15
Prior sentencing occasions									
Overall	.636*	.586	.686	.624*	.539	.710	6	1,164	12.19*
Aboriginal	.581	.473	.689	.596	.404	.787	3	209	6.25*
Non-Aboriginal	.651*	.594	.708	.646*	.556	.735	3	955	4.67
								Between level Q	1.27
Any community supervision violation									
Overall	.636*	.586	.685	.606*	.518	.695	6	1,164	13.05*
Aboriginal	.489	.376	.603	.494	.348	.639	3	209	3.08
Non-Aboriginal	.670*	.615	.725	.670*	.613	.727	3	955	2.12
								Between level Q	7.85**
Years free prior to index sex offence									
Overall	.626*	.574	.678	.614*	.543	.684	6	1,164	7.89
Aboriginal	.523	.407	.639	.523	.407	.639	3	209	1.97
Non-Aboriginal	.652*	.594	.710	.651*	.591	.712	3	955	2.15
								Between level Q	3.77^a
Any prior non-sexual violence									
Overall	.575*	.520	.629	.571*	.510	.633	6	1,164	5.91
Aboriginal	.527	.412	.641	.527	.412	.641	3	209	1.42
Non-Aboriginal	.589*	.527	.651	.586	.500	.671	3	955	3.62
								Between level Q	0.87
Total Static-2002R Scores									
Overall	.733*	.688	.778	.717*	.654	.779	6	1,164	7.87
Aboriginal	.608	.499	.718	.608	.499	.718	3	209	0.39
Non-Aboriginal	.759*	.709	.809	.759*	.709	.809	3	955	1.46
								Between level Q	6.02*
Total Static-2002 Scores									
Overall	.740*	.696	.784	.722*	.660	.784	6	1,164	8.01
Aboriginal	.617*	.507	.727	.617*	.507	.727	3	209	0.62
Non-Aboriginal	.763*	.716	.811	.763*	.716	.811	3	955	1.64
								Between level Q	5.75*

Note. AUC = area under the curve; CI = confidence interval. LL = lower limit; UL = upper limit. The variability (Q) within each level of the moderator was subtracted from the overall Q statistic, and the remaining Q value (between-level Q) represents the variability across studies due to the moderator variable (between-level Q; tested on a chi-square distribution with 1 as the degrees of freedom).

^ap = .052.

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

Table 6

Predictive Accuracy of the Total Scores of the Static Scales by Sample

Sample	Aboriginal				Non-Aboriginals			
	<i>n</i>	AUC	95% CI		<i>n</i>	AUC	95% CI	
			<i>UL</i>	<i>LL</i>			<i>LL</i>	<i>UL</i>
Boer (2003)								
Static-99R		.814*	.650	.978		.773*	.671	.876
Static-99	55	.809*	.609	1.000	226	.751*	.629	.872
Static-2002R		.588	.339	.837		.782*	.684	.879
Static-2002								
Bonta & Yessine (2005)								
Static-99R	26	.569	.311	.828	107	.664*	.526	.803
Static-99		.597	.365	.835		.606	.450	.763
Static-2002R	-	-	-	-	-	-	-	-
Static-2002	-	-	-	-	-	-	-	-
Haag (2005)								
Static-99R		.662	.491	.832		.704*	.607	.800
Static-99	48	.669	.499	.839	141	.674*	.571	.777
Static-2002R		.568	.378	.759		.705*	.604	.806
Static-2002		.559	.361	.748		.706*	.605	.807
Hanson et al. (2007)								
Static-99R		.676*	.518	.833		.772*	.700	.845
Static-99	106	.698*	.544	.859	588	.778*	.706	.850
Static-2002R		.644	.486	.803		.773*	.703	.844
Static-2002		.656	.494	.817		.781*	.716	.847
Nicholaichuk (2001)								
Static-99R	81	.765*	.634	.896	200	.731*	.645	.816
Static-99		.709*	.582	.835		.723*	.631	.815
Static-2002R	-	-	-	-	-	-	-	-
Static-2002	-	-	-	-	-	-	-	-

Note. AUC = area under the curve; CI = confidence interval. *LL* = lower limit; *UL* = upper limit.
 **p* < .05.

Appendix

Meta-analysis of AUC Areas for Sexual Recidivism of Static-99/R Restricting to the Three Static-2002/R samples

Item	Fixed-effect			Random-effects			k	N	Q
	AUC	95% CI		AUC	95% CI				
		LL	UL		LL	UL			
Age at release (Static-99R)									
Overall	.572*	.521	.622	.572*	.521	.622	6	1,174	4.93
Aboriginal	.484	.369	.599	.484	.369	.599	3	212	0.67
Non-Aboriginal	.592*	.536	.648	.592*	.536	.648	3	962	1.50
								Between level Q	2.76
Age at release (Static-99)									
Overall	.510	.456	.564	.510	.456	.564	6	1,174	1.54
Aboriginal	.509	.392	.626	.509	.392	.626	3	212	1.14
Non-Aboriginal	.510	.450	.571	.510	.450	.571	3	962	0.40
								Between level Q	0.00
Lived with a lover for two years									
Overall	.630*	.580	.680	.633*	.542	.724	6	1,174	15.01*
Aboriginal	.717*	.629	.805	.684	.497	.870	3	212	8.37*
Non-Aboriginal	.588*	.526	.649	.588*	.526	.649	3	962	1.08
								Between level Q	5.56*
Index non-sexual violence									
Overall	.556*	.502	.611	.561	.495	.627	6	1,174	6.74
Aboriginal	.631*	.519	.743	.641	.481	.800	3	212	3.87
Non-Aboriginal	.533	.471	.595	.533	.471	.595	3	962	0.60
								Between level Q	2.27
Prior non-sexual violence									
Overall	.584*	.530	.637	.584*	.530	.637	6	1,174	4.24
Aboriginal	.551	.438	.664	.551	.438	.664	3	212	0.95
Non-Aboriginal	.593*	.532	.654	.591*	.517	.666	3	962	2.88
								Between level Q	0.41
Prior sex offences									
Overall	.652*	.600	.704	.652*	.600	.704	6	1,174	2.49
Aboriginal	.642*	.528	.756	.642*	.528	.756	3	212	0.27
Non-Aboriginal	.596*	.596	.714	.655*	.593	.717	3	962	2.17
								Between level Q	0.05

(continued)

Table 1A. (continued)

Item	Fixed-effect			Random-effects			k	N	Q
	AUC	95% CI		AUC	95% CI				
		LL	UL		LL	UL			
Prior sentencing dates									
Overall	.610*	.559	.662	.604*	.530	.678	6	1,174	9.38
Aboriginal	.601*	.502	.699	.590	.401	.780	3	212	7.32*
Non-Aboriginal	.614*	.554	.675	.614*	.554	.675	3	962	2.01
								Between level Q	0.05
Non-contact sex offences									
Overall	.550	.494	.606	.550	.494	.606	6	1,174	2.52
Aboriginal	.497	.380	.613	.497	.380	.613	3	212	0.20
Non-Aboriginal	.566*	.502	.629	.566*	.502	.629	3	962	1.28
								Between level Q	1.04
Any unrelated victims									
Overall	.592*	.545	.640	.592*	.545	.640	6	1,174	3.27
Aboriginal	.536	.426	.646	.536	.426	.646	3	212	1.37
Non-Aboriginal	.606*	.553	.658	.606*	.553	.658	3	962	0.65
								Between level Q	1.25
Any stranger victims									
Overall	.595*	.541	.649	.583*	.513	.653	6	1,174	7.40
Aboriginal	.489	.373	.606	.489	.373	.606	3	212	1.50
Non-Aboriginal	.623*	.562	.684	.623*	.562	.684	3	962	1.91
								Between level Q	3.99*
Any male victims									
Overall	.546	.491	.601	.546	.491	.601	6	1,174	1.42
Aboriginal	.529	.409	.649	.529	.409	.649	3	212	0.45
Non-Aboriginal	.551	.489	.613	.551	.489	.613	3	962	0.87
								Between level Q	0.10
Total Static-99R Scores									
Overall	.738*	.694	.783	.738*	.694	.783	6	1,174	5.02
Aboriginal	.705*	.610	.801	.705*	.607	.804	3	212	2.12
Non-Aboriginal	.748*	.697	.799	.747*	.692	.802	3	962	2.30
								Between level Q	0.60
Total Static-99R Scores									
Overall	.733*	.686	.780	.733*	.686	.780	6	1,174	5.01
Aboriginal	.709*	.611	.806	.709*	.611	.806	3	212	1.25
Non-Aboriginal	.704*	.687	.794	.734*	.661	.807	3	962	3.44
								Between level Q	0.32

Note. AUC = area under the curve; CI = confidence interval. LL = lower limit; UL = upper limit. The variability (Q) within each level of the moderator was subtracted from the overall Q statistic, and the remaining Q value (between-level Q) represents the variability across studies due to the moderator variable (between-level Q; tested on a chi-square distribution with 1 as the degrees of freedom). *p < .05, **p < .01.