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The Prediction of Recidivism with Aboriginal Offenders: A Theoretically Informed Meta-Analysis¹

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Des études ont établi huit principaux facteurs de risque/de besoin, basés sur de la théorie, pouvant prédire le récidivisme. Par contre, peu de recherches examinent l'applicabilité de ces facteurs de risque chez les contrevenants autochtones. Une méta-analyse a été entreprise pour examiner si (1) les antécédents criminels, (2) les attitudes pro-criminelles, (3) les pairs pro-criminels, (4) les attitudes antisociales, (5) les problèmes à l'école ou au travail, (6) les problèmes familiaux/conjugaux, (7) l'abus d'alcool et de drogues et (8) les loisirs sont applicables aux contrevenants autochtones. De plus, elle examine si ces facteurs peuvent prédire le récidivisme pour ce groupe aussi bien qu'ils le peuvent pour les contrevenants non autochtones. Trente-deux rapports/ articles et douze ensembles de données ont été consultés, lesquels ont abouti à 49 échantillons indépendants et 1 908 ampleurs de l'effet. Les résultats d'analyses d'effets randomisées et fixes indiquent que tous les facteurs de risque/de besoin prédisaient un récidivisme violant et général chez les contrevenants autochtones. Par contre, certains facteurs donnaient de meilleures prévisions pour les contrevenants non autochtones. Cette étude a aussi examiné d'autres facteurs (p. ex. : antécédents de victimisation et facteurs émotifs) et a tenté d'évaluer des facteurs de risque propres aux Autochtones (p. ex. : l'identité culturelle), mais aucune étude empirique portant sur ces facteurs n'existe. Les limites et des orientations futures sont abordées, mais, en général, les résultats appuient l'idée que les huit principaux facteurs de risque prédisent correctement le récidivisme chez les contrevenants autochtones.

Mots clés : Autochtones, risque, prédiction, récidive, contrevenants, méta-analyse

Research has established eight theoretically based central risk/need factors predictive of recidivism; however, there is little research examining the applicability of these risk factors to Aboriginal offenders. A meta-analysis was

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undertaken to examine whether (1) criminal history, (2) pro-criminal attitudes, (3) pro-criminal associates, (4) antisocial personality pattern, (5) employment/ education, (6) family/marital, (7) substance abuse, and (8) leisure/recreation are applicable to Aboriginal offenders and whether these factors predict recidivism equally well for this group as they do for non-Aboriginal offenders. Thirty-two reports/articles and 12 data sets were reviewed which yielded 49 independent samples producing 1,908 effect sizes. Using both random and fixed effects analyses, results indicated that all of the central eight risk/need factors were predictive of general and violent recidivism for Aboriginal offenders; however, some factors predicted significantly better for non-Aboriginal offenders. This review also examined other factors (e.g., history of victimization and emotional factors) and there was an attempt to evaluate Aboriginal-specific risk factors (e.g., cultural identity) but no empirical studies existed on the latter. Limitations and future directions are discussed, but overall, the results support the position that the central eight risk factors are valid predictors of recidivism for Aboriginal offenders.

Keywords: Aboriginal, risk, prediction, recidivism, offenders, meta-analysis

In Canada, Aboriginal peoples are significantly over-represented among offender populations. Nationally, Aboriginal peoples represent 3% of the adult Canadian population but account for 18–21% of admissions to custody and probation (Calverley 2010). The proportion of Aboriginal offenders in the federal/provincial/territorial correctional systems varies widely, with the highest rates found in the prairies and the northern territories. For example, in Saskatchewan, 11% of the general population is Aboriginal yet Aboriginal offenders represent 81% of sentenced admissions to provincial prisons (Perreault 2009). At the federal level, Aboriginal offenders constitute 17.9% of the total offender population, with Aboriginal women comprising 32.6% of incarcerated women (Public Safety Canada 2010). Furthermore, the rate of Aboriginal over-representation among the offender population has been growing (Perreault 2009).

The reasons for the over-representation of Aboriginal peoples among offender populations are many and have been discussed by scholars, political pundits, and governments for years (e.g., Canada 1996; Welsh and Ogloff 2008). The purpose of this article is not to add to this literature but to deal with one of the consequences of this over-representation, and that is the necessity to manage the growing numbers of Aboriginal offenders in a humane, rational, and effective manner. Correctional systems are entrusted by the public with the responsibility of housing offenders in facilities suitable to the offender's risk for disruptive and dangerous behaviour and to supervise them in the community at levels of supervision that balance community safety with the least restrictive intervention. Correctional systems are also expected to facilitate the rehabilitation of offenders. These mandates require the use of risk/need offender assessments, which should be comprised of factors that have demonstrated applicability to the populations with which they are used.

Towards a theoretically informed assessment of offender risk

The process of offender risk assessment involves judgements of the relevance of certain psychosocial and situational characteristics to future criminal offending. The major challenges in this process are, first, selecting the factors that may predict criminal behaviour, and then, demonstrating their predictive validity. The latter challenge is relatively straightforward and involves the measurement of the potential risk factors at Time 1 and linking these measures to criminal behaviour at Time 2. The first challenge, selecting the factors that may be predictive of criminal behaviour, is usually addressed in one of two ways. The first approach, "dustbowl empiricism," takes whatever information is readily available and then tests whether any of the factors are statistically associated with recidivism (Bonta 1997). The second approach, "theoretically informed," is to consider factors that are drawn from a conceptual understanding of criminal behaviour.

As any casual perusal of an introductory criminology textbook will attest, there are many theories of criminal conduct. However, most of the theories can be subsumed under one of three broad theoretical perspectives on criminal behaviour (Bonta 2002). First, there is sociological criminology, where the theories trace the causes of crime to a person's location within the social structure. For example, membership in a disadvantageous group (young, poor, racial/ethnic minority) is viewed as a risk factor. Despite the pervasiveness of sociological criminology's perspective on crime among academia and the public, the extant evidence shows that these factors are relatively minor predictors of criminal behaviour (Andrews and Bonta 2010; Gendreau, Little, and Goggin 1996). The second perspective, forensic mental health, posits criminal behaviour to be a consequence of psychological pathology (e.g., neurotic, low self-esteem, schizophrenic). Once again the evidence indicates that, except for antisocial personality and psychopathy, such factors are minor risk variables (Andrews and Bonta 2010; Bonta, Law, and Hanson 1998; Gendreau et al. 1996; Hanson and Morton-Bourgon 2005).

The third broad perspective is cognitive, social learning theory. One of the theories under this perspective is the General Personality and Cognitive Social Learning (GPCSL) model described by Andrews and Bonta (2010). The model incorporates distal and biosocial factors such as neighbourhood and race/ethnicity along with more proximal variables that influence the probability of criminal behaviour. The more proximal influences are the signalled rewards and costs in the immediate situation along with contextual and personal *central eight* risk/ need factors. Four of these risk/need factors, described as the big four, have the most direct and immediate influence on criminal behaviour. They are criminal history (reflecting behavioural habits), pro-criminal attitudes, pro-criminal associates, and antisocial personality pattern (e.g., impulsive, egocentric, feelings of hostility). Rounding out the central eight are the more moderate risk/need factors of employment/ education, family/marital, substance abuse, and leisure/recreation. These latter four risk/need factors exert their effect through the big four. For example, abusing drugs may lead to involvement with procriminal associates, and being raised by criminal parents may enhance the learning of pro-criminal attitudes. Meta-analytic summaries of these risk/need factors for general offenders find a mean effect size (r) of 0.26 for the big four and 0.17 for the remaining four risk/need factors of the central eight (Andrews and Bonta 2010: 65).

The GPCSL perspective is a general theory of criminal behaviour. In other words, the central eight risk/need factors are hypothesized to be relevant across offender types. Research has demonstrated that many of the risk/need factors drawn from the central eight appear relevant to women offenders (Smith, Cullen, and Latessa 2009), youth (Schwalbe 2009), mentally disordered offenders (Bonta et al. 1998), and sexual offenders (Hanson and Morton-Bourgon 2005, 2009). Further research is needed to strengthen this pattern of results among these offenders, and we have little knowledge of the applicability of the central eight to Aboriginal offenders.

Risk assessment with Aboriginal offenders

Actuarial risk assessment instruments have been available since Burgess's pioneering work in the 1920s (Burgess 1928) but widespread use of them was not seen until the 1980s. Today, many correctional systems around the world use some type of actuarial, evidence-based offender risk instrument. The development of these instruments has been based largely on Caucasian male offenders (e.g., the level of service instruments; Andrews 1982; Andrews and Bonta 1995; Debidin 2009; Hoffman

1996). Not surprisingly, when the instruments are applied to groups that differ significantly from the construction samples, they are criticized for making the assumption that the instruments, and the risk items comprising the instrument, would be equally valid to the new group. This criticism is prevalent among feminist scholars (Hannah-Moffat and Shaw 2001; Holtfreter, Reisig, and Morash 2004), and it has also been raised by those questioning their validity among African-American and Hispanic minority groups (Whiteacre 2006). This is clearly an issue in Canada, Australia, and New Zealand where Aboriginal peoples constitute a significant racial/ethnic minority.

In Canada, risk assessment instruments developed on non-Aboriginal male offenders are, for the most part, also administered to Aboriginal offenders. Critics have suggested that using these instruments introduces a cultural bias that may negatively and unfairly affect the risk assessment of Aboriginal offenders (LaPrairie 1995; Martel, Brassard, and Jaccoud 2011; Waldram 1992). Many risk instruments measure factors such as employment stability, educational achievement, and substance abuse; and while Aboriginal offenders may have more of these risk factors than non-Aboriginal offenders, the reason is that many Aboriginal communities have high rates of poverty and unemployment as a consequence of a long history of social marginalization. Nevertheless, risk instruments constructed on non-Aboriginal offenders are used in several correctional jurisdictions across Canada and Australia. In Canadian provincial jurisdictions, there are four major instruments used for adult offender classification. They are the community risk/ needs assessment (CRNA; British Columbia), the service planning instrument (SPIn; Alberta), the primary risk assessment (PRA; Saskatchewan) and, for the remaining provinces and territories, the level of service (LS) instrument (Wormith, Ferguson, and Bonta in press). For young offenders, a youth version of the LS instrument is the most common. All of these offender assessment instruments tap into indicators of most if not all of the central eight risk/need factors. Presently, research with these assessment tools is limited to the CRNA, PRA, and the LS (Alberta only implemented the SPIn in 2009).

All three instruments have demonstrated predictive validity with Aboriginal offenders. In a study of 374 males and 376 female Aboriginal probationers, the CRNA predicted recidivism over a 4-year follow-up (r = 0.30; British Columbia 2004). Furthermore, there were no statistically significant differences between male and female Aboriginal offenders in the predictive validity of the CRNA, leading to the conclusion that the risk factors for Aboriginal and non-Aboriginal offenders

were similar. For the PRA, Bonta, LaPrairie, and Wallace-Capretta (1997) found that PRA intake scores predicted recidivism for Aboriginal offenders (r = 0.23, N = 390). They further broke down their sample into three groups: (1) Métis (N = 153), (2) Aboriginal offenders with registered Indian status and living on reserves (N = 153), and (3) those with registered Indian status but living off reserves (N = 113). The PRA predicted recidivism for the Métis and on-reserve Aboriginal offenders (r = 0.35 and r = 0.21, respectively) but not for the off-reserve subgroup.

There are three versions of the LS instruments, and it is noteworthy that the LS instruments, which are theoretically based on GPCSL, most closely map the central eight risk/need factors. They are the level of service-Ontario revision (LSI-OR; Andrews, Bonta, and Wormith 1995), the level of service inventory-revised (LSI-R: Andrews and Bonta 1995) and the level of service/case management inventory (LS/CMI; Andrews, Bonta, and Wormith 2004). The LSI-OR is used in Ontario, the LSI-R is used in Prince Edward Island and the Yukon, and the LS/CMI is used by Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, Manitoba, Nunavut, and the Northwest Territories. Prospective studies on Aboriginal offenders with the LS instruments are few in number compared to the vast amount of research with non-Aboriginal offenders. The published research with Aboriginal offenders has, thus far, been preliminary. Bonta (1989) and Andrews, Dowden, and Rettinger (2001) found support for the LS, but the sample sizes were small (N = 48 and N = 52 respectively). Clearly, there is a need for further study of the LS instruments with Aboriginal samples.

In contrast to the general use of offender risk scales with Aboriginal offenders in the provincial and territorial correctional systems, the federal correctional system has been more cautious, partly because of the inconsistent findings with some of their risk instruments (Blanchette and Motiuk 2004; Dowden and Serin 2000; Webster and Doob 2004). Correctional Service of Canada's (CSC) most widely used offender risk instrument is the statistical information on recidivism scale (SIR; Nuffield 1982), originally developed on Caucasian male offenders. For Aboriginal male offenders, there have been two studies on the validity of the SIR scale. The first study (Hann and Harman 1993) of male Aboriginal inmates, released in 1983/84, showed promising results, but the sample size was relatively small (N = 271). The second study (Nafekh and Motiuk 2002) used a proxy SIR scale but had a much larger sample of Aboriginal male offenders (N = 1,211). They found Pearson correlations of 0.36 for general recidivism and 0.14 for violent

recidivism. Despite the positive results reported for Aboriginal males, Nafekh and Motiuk (2002: 28) concluded that "the SIR Proxy is currently not an adequate tool for use with Aboriginal males." Today, the use of the SIR in CSC is still limited to non-Aboriginal male offenders (CSC, Standard Operating Practice 700–4).

The present study

Continued research on the validity of the various risk scales is needed to establish their usefulness. However, at a more general and theoretical level, there is a need to understand the major risk/need constructs and their relevance to Aboriginal offenders. Are the central eight risk/ need factors applicable to Aboriginal offenders? Are some of the central eight more predictive for one group compared to the other? Are there other factors outside of the central eight (e.g., gender, victimization experiences, emotional problems, cultural identity) suggested by some (Holtfreter et al. 2004; Lowenkamp, Holsinger, and Latessa 2001) that may be as or even more relevant? Answers to these questions are important for several reasons.

First, demonstrations of the validity of the central eight with Aboriginal offenders would represent a test of the universality of the risk factors derived from the GPCSL perspective advanced by Andrews and Bonta (2010). Such demonstrations can take the form of predictive validity studies of offender classification instruments that reflect the central eight risk/need factors (e.g., LS studies). Or, as we intend to show in this article, demonstration can include tests of individual central eight risk/need factors through meta-analysis. Second, if the central eight is not as robust in its predictive validity with Aboriginal offenders as it is with non-Aboriginal offenders then the findings could guide the development of new classification instruments specific to this group.

Until now, the only report addressing the relevance of the central eight to Aboriginal offenders is Rugge's (2006: iv) narrative literature review, where she concluded "the majority of risk factors are applicable to Aboriginal offenders." In the present study, we apply meta-analytic techniques to investigate the validity of the central eight risk/need factors. Meta-analysis has several advantages over the more traditional literature review. In meta-analyses, studies are included regardless of whether the results are statistically significant at the p < 0.05 level thus avoiding some of the problems associated with null hypothesis significance testing (Cohen 1994). Meta-analysis is also less influenced

by author bias in the selection and weighting of studies since the criteria for selection and weighting are explicitly specified a priori (Wolf 1986). Perhaps the most important advantage to meta-analysis is that the magnitude of the results can be described without the author(s) deciding subjectively whether a result is small, moderate, or large (Lipsey and Wilson 2001).

The meta-analysis presented in this report was theoretically informed by the GPCSL perspective and focused on two questions: (1) Are the central eight risk factors predictive for Aboriginal offenders, and, if so, (2) Are they equally predictive for Aboriginal offenders as for non-Aboriginal offenders? Coding of the variables was structured around the central eight risk/need factors. However, where available, we also explored the potential of other variables to function as risk/need factors (e.g., psychological distress, cultural). In many meta-analyses, theory has often taken a back seat in guiding the quantitative review and interpretation of the results. We, along with Schmidt and his colleagues (Schmidt 1992; Hunter and Schmidt 1996; Schmidt 2006), would suggest that theory should have a more central role.

Method

Selection of studies

We began by selecting the studies reviewed by Rugge (2006) followed by computer searches of PsycINFO, Web of Science, iPortal, Criminal Justice Abstracts, ProQuest, Dissertation Abstracts, and the National Criminal Justice Reference System (NCJRS). The searches used the following key terms: Aboriginal*, Indian, Indigenous, ethnicity, race, Maori, culture, minority, First Nations, Métis and recid*, relapse, offen*, prison, or reoffen*. Additional articles were obtained through an examination of reference lists of the collected articles and e-mails to established researchers in the field of risk assessment. Some of the researchers provided the data sets, without personal identifying information, that were used for their studies, dissertations, and conference presentations. The period under review was 1 January 1988 to 31 August 2010.

Including studies for the meta-analysis was based on three criteria. The first required that a study consider a sample of offenders who identified as Aboriginal, either by status or self-report. This included any Aboriginal group or sub-group (Nation/tribe) as well as any offender group (i.e., general offender, sexual, violent). Second, the study must

have investigated the predictive validity of risk predictors (e.g., criminal history).We searched for culturally relevant factors (e.g., cultural dislocation, urban/rural setting), but none of the articles located examined them as predictors. There was also insufficient information in the studies obtained to explore the predictive ability of risk factors by Nation/tribe or urban/rural setting. A study was excluded if the only risk predictor included was ethnicity. The final criterion required studies to include a follow-up period with some form of recidivism outcome (e.g., general, violent).

Multiple articles that used the same sample (or had overlapping samples) and measured the same risk predictors were considered one study, with the study with the longest follow-up and/or a larger sample size chosen for inclusion. If articles with overlapping samples examined different predictors, they were included in the study with an identifier indicating that the samples overlapped. The Aboriginal groups from the various countries (Canada, Australia, and United States) were assessed as a combined sample. The reason for this was twofold: (1) the nature of the present study is to conduct a preliminary review of risk predictors with Aboriginal offenders; and (2) the countries represented in this study share many socio-historical commonalities and have similar overrepresentation of Aboriginals in their respective justice systems (e.g., Armitage 1995; Maynard, Coebergh, Anstiss, Bakker, and Huriwai 1999; Samuelson 1993). Moderator analyses were conducted by country to explore whether there were any differences among the Aboriginal groups.

Studies had to include sufficient statistical information to calculate an effect size (i.e., Cohen's d) and the recidivism rate. For articles where critical information was not reported (e.g., base rates), attempts were made to contact the original authors for the missing information. The search yielded 44 usable documents (i.e., published articles, government reports, conference presentations, unpublished dissertations, data sets) originating from three different countries: Canada (74.4%), United States (4.7%) and Australia (20.9%). The average sample size was 3,057, ranging from 9 to 129,012.

Twelve data sets were provided to us by researchers. This allowed us to use the raw data to code variables that were unpublished or referred to in conference presentations. The data sets included potential risk factors and recidivism outcomes. Raw correlations between predictors and outcomes were calculated and coded regardless of their level of statistical significance.

Coding procedure

The coding focused on the central eight risk/need factors; however, we also coded for victimization history, emotional problems, gender, and age. We searched for studies of Aboriginal-specific factors (e.g., cultural identity), but we could not locate any study that met our selection criteria. Indicators of a central eight risk/need factor could vary from study to study. For example, an indicator of the construct criminal history could be as simple as being a first time offender (or not) in one study and a history of incarceration in another study. The coding guide (available from the first author) provided examples of the type of information to be considered under the construct. In situations where an unexpected risk factor was reported in a study that could not easily be categorized into one of the central eight constructs then a consensus was reached for its placement. If multiple individual risk predictors (e.g., number of prior convictions and age at first offence) were considered under a central eight risk/need factor (e.g., criminal history), the effect sizes of the individual predictors were averaged. Finally, we also coded for other non-central eight factors (e.g., age, emotional problems, victimization) to explore the validity of these variables among Aboriginal offenders.

Our two major dependent variables were general or any recidivism and violent recidivism (including sexual crimes). Recidivism for each outcome variable was measured in different ways in the studies (e.g., new arrest, re-incarceration). When more than one outcome was reported in a study, the outcome chosen for calculating the effect size was assigned according to the following ranking: (1) reconviction, (2) re-incarceration (excluding technical violations), (3) all inclusive reincarceration, (4) a new arrest or charges, and (5) any other disposition (e.g., breach of conditions, parole violation).

All studies (including the data sets) were coded by the second author. To measure inter-rater reliability, the first author coded 7 of the 32 studies and 3 of the 12 data sets. Using a two-way random-effects model intra-class correlation coefficient (type absolute agreement), the inter-rater reliability of the effect sizes was 0.997 for a single rater and 0.998 for the average of the two raters. The high inter-rater reliability is not surprising, as most effect sizes were calculated using a 2×2 table and standard workbook for calculating *ds*. Most discrepancies involved rounding errors, which were corrected for the final rating. In the 10 reliability studies, Rater 1 identified 1,002 effect sizes and Rater 2 identified 1,001 effect sizes.

Index of predictive accuracy

Research question 1

The effect size indicator was the standardized mean difference between recidivists and non-recidivists (Cohen's d) and it was calculated according to the formula:

$$d = (M_1 - M_2)/S_w$$

where M_1 is the mean of the recidivistic group, M_2 is the mean of the non-recidivistic group, and S_w is the pooled-within standard deviation (Hasselblad and Hedges 1995).

Given that *d* values are less influenced by recidivism base rates, it was chosen over other common effect size indicators (e.g., *r*) that are more affected by base rates. When interpreting *d*, we followed Cohen's (1988) guidelines, where *d* values of 0.20 are considered "small," 0.50 "medium," and 0.80 as "large." When the 95% confidence interval (CI) does not contain zero, the *d* value can be considered statistically significant (i.e., p < 0.05). Non-overlapping CIs for two predictors indicate that the two predictors are significantly different from one another.

For 2×2 tables, the variance of d_i was estimated from Sánchez-Meca, Marín-Martínez, and Chacón-Moscoso (2003; their Formula 19) with 0.5 added to each cell to account for empty cells during analysis (Fleiss 1994):

$$Var(d_i) = 0.367 \left(\frac{1}{a+0.5} + \frac{1}{b+0.5} + \frac{1}{c+0.5} + \frac{1}{d+0.5} \right)$$

When calculating d_i from other statistics (e.g., means, ROC areas, regression betas), the variance was estimated from Hasselblad and Hedges (1995), using their Formula 3:

$$Var(d_i) = \left[\frac{N_1 + N_2}{N_1 N_2} + \frac{d_i^2}{2(N_1 + N_2)}\right]$$

Research question 2

To reduce the within-study variability, we restricted our analysis to studies that reported the predictive accuracy of risk factors for both Aboriginal and non-Aboriginal samples. For both samples, Cohen's d was calculated for each risk predictor using the procedure described

above. The index used to assess the difference in effectiveness of the central eight was the d_i *difference*, which was calculated for each predictor within each study by subtracting the d_i of the non-Aboriginal sample from the d_i of the Aboriginal sample. The variance for the d_i *difference* was calculated according to Ley (1972) using the following formula:

$$Var(d_i \ diff) = s_x^2 + s_y^2 - 2r_{xy}s_xs_y$$

where s_x is the standard deviation of the d_i from the Aboriginal sample, s_y is the standard deviation of the d_i from the non-Aboriginal sample and r_{xy} is a correlation coefficient estimating the relationship between the average effect size for the Aboriginal sample and the non-Aboriginal sample. The correlation coefficient was derived from the risk factor with the greatest number of unique effect sizes (i.e., *criminal history combined*), thereby providing the largest correlation and, in turn, the most conservative estimate.

Aggregation of findings

Analysis for both research questions was aggregated using the same procedure, despite different effect size measures. When summarizing the findings, weighted mean values were used (Hasselblad and Hedges 1995). More weight was given to larger samples by weighting each d_i (or d_i difference for research question 2) by the inverse of its variance:

$$d^* = \left(\sum_{i=1}^k w_i^* d_i\right) \middle/ \left(\sum_{i=1}^k w_i^*\right)$$

where $w_i^* = 1/[v + v^*]$, v is the variance of the individual d_i , v^* is the amount of between-study heterogeneity, and k = the number of findings. The variance of the weighted mean was calculated to estimate 95% CIs:

$$Var(d^*) = 1 / \left(\sum_{i=1}^k w_i^*\right); \ 95\% \text{ C.I.} = d^* \pm 1.96(Var[d^*])^{1/2}$$

The results were reported for both fixed and random effects. Fixed effects models restrict conclusions to the studies examined in the metaanalysis as they only consider within-study variability. This results in narrow CIs and often a more liberal interpretation of results (Hedges and Vevea 1998). Random effects models take into consideration between-study variability and, therefore, produce CIs with a wider range than those of a fixed effects model. This model provides more conservative estimates and allows for generalization of results outside of the observed set of studies (Hedges and Vevea 1998).

To assess the homogeneity of variance, the Q statistic was used (Hedges and Olkin 1985). The Q statistic is commonly used to test the generalizability of effects across studies and follows a χ^2 distribution with k - 1 degrees of freedom (k = number of studies). Q values higher than the predetermined statistical level of p < 0.05 indicate that there are significant differences among studies. The Q statistic only shows that heterogeneity exists; however, the degree of heterogeneity can be quantified using the I^2 statistic estimated from Huedo-Medina, Sánchez-Meca, Marín-Martínez, and Botella (2006) using their Formula 10:

$$I^2 = \left[\frac{Q - df}{Q} \times 100\right]$$

According to Huedo-Medina et al. (2006), percentages of 25, 50, and 75 indicate small, medium, and large proportions of heterogeneity, respectively. A negative value of I^2 was interpreted as 0. Furthermore, for research question 1, moderator analysis was conducted to examine the influence of specific study and sample variables on the predictive accuracy of risk factors for Aboriginal offenders. The *Q*-change statistic (also known as *Q*-between or $Q\Delta$), which tests whether the magnitude of the effect size is significantly associated with a given variable, was used. *Q*-change values higher than p < 0.05 indicate that there is a significant difference in the predictive validity of the risk factor as a function of the moderator variable.

Outliers were identified by consideration of the weighted sum of squares (*wss*; a measure of the contribution of each study to the mean weighted d^*) and any single extreme value of d_i compared to the mean weighted effect size. Outliers were excluded from each category if the single value accounted for more than 50% of the total variance (*Q*). The presence of outliers was not considered if there were fewer than four studies in a category contributing to the mean effect size or the *Q* was not significant.

Results

Thirty-two reports/articles and 12 data sets yielded 49 independent Aboriginal samples producing 1,908 unique effect sizes. Thirty-one of the studies (70.5%) were peer reviewed (which includes articles in a peer-reviewed journal and theses/dissertations) as of March 2012. The majority of the studies originated from Canada (75%, k = 33) followed by Australia (20.5%, k = 9) and the United States (4.5%, k = 2). Although the dates of completion for these studies ranged from 1988 to 2010, 61.4% were completed after 2004. The average follow-up time for the combined sample of Aboriginal and non-Aboriginal offenders was 42.80 months (SD = 32.84, k = 41; three studies report only the maximum follow-up time and not the average).

A summary description of the sample is displayed in Table 1. The mean age for the entire sample was 27.48 years (SD = 8.28, k = 37). The average sentence length was 27.14 months (SD = 20.12, k = 23) with a mean length of time ever in prison/hospital of 23.31 months (SD = 32.19, k = 22). The majority of the sample consisted of general/mixed adult male offenders released from community supervision. The unweighted recidivism rate for general/any recidivism for the Aboriginal and non-Aboriginal samples was 55.9% and 38.4%, respectively. For violent recidivism, the rates were 47.7% for Aboriginal offenders.

Question I

Predictors of general recidivism for Aboriginal offenders

Evaluating the risk factors for recidivism among Aboriginal offenders involved the examination of (1) the validity of the central eight risk/ need factors and (2) other potential risk factors (e.g., age and gender). These analyses were also conducted for violent recidivism. The results for general recidivism are presented in Table 2. We report the findings for both fixed and random effects analyses. However, only the results of the random effects analyses are reported in the body of the text as random effects provide a more conservative estimate.

The central eight

For both the fixed and random effects analyses, each of the central eight risk/need factors significantly predicted general recidivism for Aboriginal offenders (Table 2). Mean effect sizes ranged from d = 0.19 (95% CI = 0.13, 0.26) for family/marital to d = 0.56 (95% CI = 0.46, 0.65) for criminal history. The best predictors were criminal history,

Sample Characteristics	Aborigiı (N = 57	nal ,315)	non-Abo (<i>N</i> = 204	riginal I,977)
	%	k	%	k
Gender (male)	78.5	43	77.6	32
Sample Type				
Adult	75.0	33	66.7	22
Juvenile	20.5	9	30.3	10
Setting released from				
Community	52.3	23	51.5	17
Custodial/Residential	36.4	16	35.1	П
Forensic hospital/Mental health facility	9.1	4	10.8	4
Previous criminal record	68.8	18	56.8	12
Offender Type				
General/Mixed	75.0	33	72.7	24
Sexual (only)	11.4	5	15.2	5
Violent (only)	6.8	3	6.1	2
Mentally disordered offender	2.3	I	3.0	I.
Recidivism Type				
General/Any		42		31
Violent (including sexual)		13		10
Sexual (only)		6		6

Table 1: Characteristics of Aboriginal and non-Aboriginal samples

Note: k represents the total number of independent samples.

antisocial personality pattern, and pro-criminal associates. However, significant variability, as measured by Q and I^2 , was observed for all of the risk/need factors except for antisocial personality pattern (see Table 2).

Other predictors

Both gender and age predicted general recidivism (d = 0.26, 95% CI = 0.17, 0.34; d = 0.29, 95% CI = 0.14, .45, respectively). Similarly, both the Victim (d = 0.23, 95% CI = 0.13, 0.32) and Emotional (d = 0.18, 95% CI = 0.07, 0.29) variables were significantly related to general recidivism. For three of the four "other" predictors, there was a significant amount of variability among studies.

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Table

			Fixed			Random					
			95% CI			95% CI					
Risk Factors	Median <i>d</i>	Mean d	Lower	Upper	Mean d	Lower	Upper	¢	12 (%)	¥	z
Central Eight											
Criminal history	0.52	0.44	0.41	0.47	0.53	0.39	0.68	517.65*	95.36	25	33,974
Outlier removed	0.55	0.57	0.54	0.61	0.56	0.46	0.65	149.49*	84.61	24	30,615
Employment/Education	0.43	0.37	0.34	0.41	0.38	0.29	0.47	73.19*	75.41	61	25,243
Family/Marital	0.24	0.16	0.13	0.19	0.19	0.13	0.26	71.95*	65.25	26	30,330
Leisure/Recreation	0.33	0.30	0.26	0.35	0.33	0.23	0.43	32.19*	68.93	=	18,657
Pro-criminal associates	0.41	0.38	0.34	0.42	0.39	0.31	0.48	59.34*	74.72	16	24,397
Substance abuse	0.37	0.34	0.31	0.38	0.33	0.23	0.44	117.43*	83.82	20	25,153
Pro-criminal attitudes	0.36	0.28	0.24	0.32	0.32	0.24	0.40	46.88*	70.14	15	23,803
Antisocial personality pattern	0.51	0.57	0.51	0.63	0.57	0.50	0.63	9.18	1.96	0	4,840
Other Risk Factors											
Gender ^a	0.31	0.27	0.24	0.30	0.26	0.17	0.34	73.41*	83.65	13	25,531
Age ^b	0.28	0.20	0.18	0.23	0.29	0.14	0.45	505.58*	96.44	61	33,302
Outlier removed	0.29	0.32	0.29	0.35	0.32	0.21	0.43	165.41*	89.72	8	29,056
Victim ^c	0.23	0.19	0.12	0.26	0.11	-0.08	0.29	30.12*	83.40	9	4,267
Outlier removed	0.29	0.22	0.15	0.29	0.23	0.13	0.32	6.22	35.69	2	4,152
Emotional ^d	0.16	0.20	0.16	0.24	0.18	0.07	0.29	40.49*	77.77	0	9,574
 Male coded as I. Younser coded as I. 											

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rounger coded as 1. Includes victim of physical assault, emotional abuse, sexual assault, and neglect.

Includes depressed, low self-esteem, shy/withdrawn, evidence of emotional distress, emotional/personal factors, and self injury. p < 0.05. P

Predictors of violent recidivism for Aboriginal offenders

The central eight

As with the prediction of general recidivism, each of the central eight was predictive of violent recidivism using both fixed and random effects analyses (see Table 3). The predictive validity estimates ranged from d = 0.11 (95% CI = 0.06, 0.16, k = 8; family/marital) to d = 0.45 (95% CI = 0.27, 0.63, k = 7; criminal history). The best predictors were criminal history, antisocial personality pattern, and pro-criminal attitudes. However, there was a significant amount of variability in all of the central eight predictors (Q range = 15.68 to 29.75, p < 0.05; I^2 range = 74.5 to 83.2%), except for family/marital and companions.

Other predictors

For the other risk factors, only age, victim, and emotional could be explored. Age was found to be related to violent recidivism (d = 0.16, 95% CI = 0.05, 0.27, k = 7). For victim, the findings for fixed and random effects were inconsistent (random effects showed a small significant relationship, d = 0.03, 95% CI = 0.02, 0.04, k = 4). The predictor emotional failed to reach statistical significance.

Moderator analyses

Several study and sample characteristics were tested to see if they moderated the predictive validity of the various risk/need factors in the prediction of general recidivism. *Q*-change (Q_{Λ}) , which isolates the between-level Q or the variability between levels of each moderator (e.g., community vs. custody, adult vs. juvenile sample) for each predictor, was used to assess the effect of a moderator. For a risk factor to be included in the moderator analysis, there had to be a minimum of three effect sizes in each grouping (e.g., for the moderator variable male [majority male offenders], there had to be a minimum of three effect size estimates in the "yes" category and three in the "no" category). Nine predictors had a sufficient number of effect size estimates available for analysis with respect to general recidivism. There was no significant variability for antisocial personality pattern; therefore, moderator analyses were not needed. There were an insufficient number of effect size estimates to conduct moderator analyses with respect to violent recidivism. For ease of reporting and interpretation, only the mean weighted d is presented in Table 4.

			Fixed			Random					
			95% CI			95% CI					
Risk Factors	Median d	Mean d	Lower	Upper	Mean d	Lower	Upper	Q	12	×	z
Central Eight											
Criminal history	0.31	0.26	0.21	0.3 I	0.39	0.17	0.62	105.12*	93.34	œ	7,827
Outlier removed	0.35	0.43	0.36	0.49	0.45	0.27	0.63	29.75*	79.83	7	4,514
Employment/Education	0.30	0.26	0.20	0.33	0.33	0.17	0.49	15.68*	74.49	ъ	4,352
Family/Marital	0.25	0.11	0.06	0.16	0.11	0.06	0.16	6.95	0	œ	8,331
Pro-criminal associates	0.26	0.23	0.17	0.29	0.23	0.15	0.32	4.20	28.57	4	4,307
Substance abuse	0.29	0.21	0.14	0.27	0.23	0.07	0.40	16.55*	75.83	ъ	4,353
Pro-criminal attitudes	0.37	0.28	0.21	0.34	0.33	0.15	0.52	23.75*	83.16	ъ	4,395
Antisocial personality pattern	0.28	0.37	0:30	0.43	0.36	0.19	0.53	21.70*	76.96	9	4,442
Other Risk Factors											
Age ^a	0.20	0.13	0.08	0.18	0.16	0.05	0.27	19.34*	68.98	7	8,103
Victim ^b	0.11	0.04	-0.03	0.10	0.03	0.02	0.04	1.44	0	4	3,727
Emotional ^c	0.15	0.04	-0.03	0.11	0.06	-0.04	0.16	5.53	45.75	4	3,793
^a Younger coded as 1. ^b Includes victim of physical a	assault. emoi	tional abus	ie. sexual as	ssault. and 1	neglect.						

Table 3: Predictors of violent recidivism

includes victim of physical assault, emotional abuse, sexual assault, and neglect. ^c Includes depressed, low self-esteem, shy/withdrawn, evidence of emotional distress, emotional/personal factors, and self injury. * p < 0.05.

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Moderator					Predictors				
	Criminal History	Employment/ Education	Family/ Marital	Leisure/ Recreation	Pro-criminal Associates	Alcohol/ Drug	Pro-criminal Attitudes	Age	Gender
Peer Reviewed									
Yes	0.42	0.26	0.16	0.23	0.28	0.24	0.21	0.17	0.33*
No	0.45	0.50*	0.16	0.38*	0.47*	0.47*	0.34*	0.22	0.19
Sample									
Juvenile	0.44	0.35	0.31	I	0.40	0.18	I	I	I
Adult	0.44	0.37	0.16	I	0.38	0.35	I	I	I
Country									
Canada	0.65*	0.45*	0.17	I	I	0.46*	I	0.23*	0.19
Australia	0.43	0.20	0.12	I	I	0.14	I	0.09	0.36*
Evaluator									
Developer	0.70	0.59*	0.39*	0.51*	0.56*	0.38	0.56*	0.43	I
Independent	0.57	0.36	0.15	0.29	0.37	0.34	0.27	0.20	I
Setting									
Community	0.57	0.33	0.16	0.28	0.3 I	0.30	0.22	0.13	0.29*
Custody	09.0	0.48*	0.16	0.37	0.52*	0.47*	0.38*	0.47*	0.16
Male (majority)									
Yes	0.60*	0.41*	0.16	0.33	0.41*	0.36*	0.29	0.22*	0.27
No	0.46	0.25	0.15	0.26	0.29	0.28	0.25	0.11	0.19
Note: Predictors wi	th insufficien	it information to t	est a moder	ator are assign	ied a dash.				

The Prediction of Recidivism with Aboriginal Offenders

* p < 0.05.

The strongest moderator was peer review status (peer reviewed vs. non-peer reviewed). Peer review status was found to significantly moderate the effects for six of the nine predictors with significant variability. Greater predictive validity estimates were found for the non-peer reviewed reports. To explore these results post-hoc, differences were assessed between both groups on sample variables (e.g., gender, sample type, age) and study variables (e.g., follow-up length, role of evaluator, study setting [e.g., custody], year). Even with a bonferroni correction, no significant differences were found.

Question 2

Differences in predictive validity between Aboriginal and non-Aboriginal offenders for general recidivism

The first set of analyses established the risk/need factors for Aboriginal offenders. This next set of analyses examined whether there was a significant difference in the predictive validity estimates between Aboriginal and non-Aboriginal offenders. Table 5 presents the weighted mean Cohen's *d* difference score (d_{diff}) for both fixed and random effects analyses. Given that the *d* difference scores were calculated by subtracting the non-Aboriginal mean weighted *d* from the mean weighted *d* of the Aboriginal sample, negative values signify that the *d* was larger for the non-Aboriginal group (e.g., ($d_{AB} = 0.25$) – ($d_{nAB} = 0.30$) = -0.05).

The central eight

Table 5 shows that of the central eight, criminal history ($d_{diff} = -0.24$, 95% CI = -0.34, -0.14), alcohol/drug ($d_{diff} = -0.16$, 95% CI = -0.20, -0.11), and antisocial pattern ($d_{diff} = -0.24$, 95% CI = -0.44, -0.03) demonstrated significantly higher predictive validity estimates for non-Aboriginal offenders than Aboriginal offenders (i.e., non-overlapping 95% CIs). For leisure/recreation and pro-criminal attitude, there were no significant differences in predictive validity between the two groups. For the remaining central eight risk/need factors, the findings for both fixed and random effects analyses were mixed, although the more conservative, random effects model found no significant differences between Aboriginal and non-Aboriginal offenders. Using the mean *d* difference score reduced the amount of within-study variability, but five factors still had significant variability across studies (*Q* range = 15.38 to 146.60, *p* < 0.05).

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			Fixed			Random					
			95% CI			95% CI					
Risk Factor	Median d _{di∰}	Mean d _{diff}	Lower	Upper	Mean d _{diff}	Lower	Upper	Q	1 ² (%)	¥	z
Central Eight											
Criminal history	-0.23	-0.14	-0.17	-0.10	-0.24	-0.34	-0.14	60.08*	73.37	17	48,845
Employment/Education	-0.04	0.07	0.03	0.10	-0.01	-0.14	0.12	96.30*	86.50	4	52,121
Family/Marital	-0.06	-0.18	-0.21	-0.15	-0.11	-0.22	0.00	l 46.60*	87.72	61	74,287
Leisure/Recreation	-0.04	-0.02	-0.08	0.03	-0.05	-0.18	0.07	20.99*	61.89	6	31,035
Outlier removed	-0.02	-0.01	-0.06	0.05	-0.01	-0.06	0.05	5.95	0.00	8	30,842
Pro-criminal associates	-0.12	0.11	0.07	0.15	-0.06	-0.23	0.10	151.81*	92.10	3	51,929
Outlier removed	-0.13	-0.08	-0.12	-0.03	-0.08	-0.18	0.01	23.20*	52.59	12	33,643
Substance abuse	-0.14	-0.16	-0.20	-0.12	-0.16	-0.20	-0.11	I 5.38	8.97	15	52,534
Pro-criminal attitudes	-0.09	-0.03	-0.07	0.01	-0.07	-0.15	0.01	26.49*	58.47	12	51,092
Antisocial personality pattern	-0.26	-0.28	-0.40	-0.16	-0.30	-0.53	-0.06	21.67*	67.70	8	3,956
Outliers removed	-0.26	-0.20	-0.35	-0.06	-0.24	-0.44	-0.03	4.88	38.52	4	2,860
Other Risk Factors											
Gender ^a	-0.10	-0.10	-0.13	-0.07	-0.12	-0.27	-0.02	25.88*	80.68	9	153,360
Outlier removed	-0.07	-0.07	-0.11	-0.03	-0.08	-0.15	0.00	4.82	17.01	S	142,098
Age ^b	0.05	-0.11	-0.14	-0.08	-0.01	-0.19	0.17	263.15*	95.82	12	68,838
Outlier removed	0.07	0.07	0.03	0.11	0.05	-0.06	0.16	45.49*	78.02	=	50,637

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^a Male coded as I. ^b Younger coded as I. * p < 0.05.

Other predictors

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The findings for the other factors (age and gender) were mixed, although the random effects analyses found no significant differences between Aboriginal and non-Aboriginal offenders on these two factors.

Differences in predictive validity between Aboriginal and non-Aboriginal offenders for violent recidivism

The central eight

With respect to the prediction of violent recidivism, there were no significant differences between Aboriginal and non-Aboriginal offenders for family/marital, alcohol/drug, or antisocial personality pattern (see Table 6). The results for criminal history, employment/education, and pro-criminal attitudes were inconsistent; however, the random effects analyses consistently found no significant differences between the groups. There was insufficient data to examine companions and leisure/ recreation. The only significant variability among studies was for employment/education (Q = 13.82, df = 2, p < .05) and pro-criminal attitudes (Q = 11.49, df = 2, p < .05).

Other predictors

The only other risk factor with a sufficient number of studies was age. For age, there was no significant difference between groups.

File drawer problem

A common criticism of meta-analysis is the potential publication bias toward the inclusion of statistically significant findings and the exclusion of non-significant findings (Rosenthal 1979). To test this potential "file drawer problem," Orwin's (1983) *fail-safe* N calculation of Cohen's d was used to estimate the number of studies with "clinically unimportant" effect sizes required to overturn the findings obtained in this meta-analysis. The criterion of what is considered a "clinically unimportant" effect was conservatively set at $d_c = 0.05$. The following formula was used:

$$N_{\rm fs} = \frac{N(d-d_c)}{d_c}$$

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			Fixed			Random					
			95% CI			95% CI					
Risk Factor	Median d _{diff}	Mean d _{aiff}	Lower	Upper	Mean d _{aiff}	Lower	Upper	¢	2 (%)	×	z
Central Eight											
Criminal history	19	12	19	06	21	47	.05	23.3 I*	78.55	9	14,800
Outlier removed	09	I 0	16	03	Ξ.	30	.07	7.69	47.98	S	14,104
Employment/Education	.54	.21	10 [.]	.42	.46	18	1.10	I 3.82*	85.53	m	2,638
Family/Marital	02	.02	04	.07	35	81	Ξ.	82.95*	93.97	9	17,542
Outlier removed	.03	.05	01	01.	.05	01	01.	3.22	0.00	S	17,130
Substance abuse	10.	08	28	.12	13	51	.25	5.31	62.34	m	2,644
Pro-criminal attitudes	.02	.39	.20	.58	.26	24	.76	11.49*	82.59	m	3,026
Antisocial personality pattern	<u> </u>	21	39	04	19	61	.23	I4.67*	79.55	4	3,256
Outlier removed	07	03	23	81.	03	23	8I.	1.93	0.00	m	2,643
Other Risk Factor											
Age ^a	—.02	02	08	<u>.</u>	—.02	08	.04	I.88	0.00	S	15,851

^a Younger coded as I. * p < 0.05.

where $N_{\rm fs}$ is the fail-safe number of studies, N is the number of studies used to estimate the d for each predictor, and d_c is the criterion value set for a clinically unimportant effect size.

Applying the above formula, the number of studies needed to overturn the results obtained regarding the predictive validity of the central eight in regard to general recidivism were as follows: criminal history $(N_{\rm fs} = 245)$; employment/education $(N_{\rm fs} = 125)$; family/marital $(N_{\rm fs} = 73)$; leisure/recreation $(N_{\rm fs} = 62)$; pro-criminal associates $(N_{\rm fs} = 109)$; substance abuse $(N_{\rm fs} = 112)$; pro-criminal attitudes $(N_{\rm fs} = 81)$; and antisocial personality pattern $(N_{\rm fs} = 104)$. For violent recidivism, we did not have enough studies to code for leisure/recreation and we had fewer studies across the board, decreasing the fail-safe N for the central eight. The results were as follows: criminal history $(N_{\rm fs} = 53)$, employment/education $(N_{\rm fs} = 21)$, family/marital $(N_{\rm fs} = 10)$, pro-criminal associates $(N_{\rm fs} = 14)$, substance abuse $(N_{\rm fs} = 16)$, pro-criminal attitudes $(N_{\rm fs} = 23)$ and antisocial personality pattern $(N_{\rm fs} = 38)$.

Discussion

The central eight risk/need factors, outlined in the general personality and cognitive social learning (GPCSL) theoretical perspective, have demonstrated validity among various offender samples but have not yet been evaluated for Aboriginal offenders. We tested the generality of the central eight through a meta-analytic review of the predictors of recidivism among Aboriginal offenders. Using the more conservative random effects analyses, all of the central eight risk/need factors predicted general recidivism and seven of the eight (there was an insufficient number of studies for leisure/recreation) predicted violent recidivism for Aboriginal offenders. Although the central eight were predictive of recidivism for Aboriginal offenders, one of the most striking findings from this study was the large amount of between-study variability and wide CIs. Clearly, there is a need for more studies to evaluate the relative importance of the various central eight risk/need factors. This variability also serves as a caveat to the following interpretation of the results as it relates to our research questions.

Our study found that the best predictors of general recidivism for Aboriginal offenders were three of the big four risk/need factors – criminal history, pro-criminal associates, and antisocial personality pattern. In GPCSL theory, the big four are hypothesized to be the most proximal and influential factors on criminal behaviour. The primacy of the big four in the prediction of recidivism was first demonstrated on general offenders (Gendreau et al. 1996), and recently, with women offenders (Andrews, Guzzo, Raynor, Rowe, Rettinger, Brews, and Wormith 2011). Although not all of the big four were tested, similar results have been reported with mentally disordered offenders (Blais, Wilson, and Bonta 2011; Bonta, Law, and Hanson 1998) and sex offenders (Hanson and Bussière 1998). The present results with Aboriginal offenders only partially replicated the primacy of the big four. Criminal history and antisocial personality pattern performed significantly better than most of the other central eight risk/need factors. Pro-criminal associates and pro-criminal attitudes predicted with generally the same accuracy as the more moderate risk/need factors. For the prediction of violent behaviour, none of the big four stood apart from the other risk/need factors. This raises the question as to whether the big four for non-Aboriginal offenders is also the big four for Aboriginal offenders. It could be that other (potentially culturally specific) risk factors not yet explored provide greater prediction estimates than those identified for non-Aboriginal offenders. An examination of how these four constructs (as well as the more moderate four) are measured within individual studies would also provide insight into how these variables are operationalized and whether they require re-definition with Aboriginal culture in mind.

In terms of the other predictors, the variable emotional was a modest predictor of general recidivism for Aboriginal offenders, and it did not predict violent recidivism at all. In a meta-analysis of general offenders, Gendreau et al. (1996) found a mean *d* effect size of 0.10 for emotional distress (converted from the *r* reported in the original report). We also found a similar effect size of d = 0.18. What is different between our findings and those of Gendreau et al. (1996) is that they found emotional problems to be a significantly poorer predictor of recidivism relative to all of the central eight risk/need factors, whereas we did not. The CIs for our variable emotional overlapped with leisure/recreation, pro-criminal associates, and pro-criminal attitude. Similarly, the variable victim predicted general recidivism as well as most of the central eight (criminal history and antisocial personality pattern excluded). While victim also predicted violent recidivism (d = 0.06), it predicted significantly more poorly than all of the central eight.

These findings raise an interesting question as to why emotional problems and history of victimization would act as potential criminogenic needs for Aboriginal offenders. Although these two variables have often played an important theoretical role in the aetiology of women offenders (Hannah-Moffat and Shaw 2001), domestic offenders (Kashani and Allan 1998), and sex offenders (Stripe and Stermac 2003), they have been largely ignored in models of general offenders. One possible answer is that Aboriginal peoples may be exposed to very high rates of violence and of dysfunctional families and communities. Greenfield and Smith (1999) reported that American Indians had the highest victimization rates of any racial group and LaPrairie (1995) also reported that three-quarters of Canadian Aboriginal inmates were raised by nonbiological step- and foster-parents and most of these were abused by those responsible for their care. Thus, the high prevalence rates of violence and exposure to a stressful environment may have had a unique influence on many Aboriginal offenders. Yessine and Bonta (2009) found that major problems within the families of Aboriginal youth significantly increased the odds of chronic criminal behaviour but the same was not true for non-Aboriginal offenders. Further research on this question is needed, with particular attention given to a possible moderating role for gender and type of offender, specifically sexual and domestic violence offenders. Unfortunately, we did not have enough studies to evaluate the possible moderating effects of these two variables.

Moderators of predictive validity

Except for antisocial personality pattern (for general recidivism), all of the central eight risk/need factors showed significant and considerable variability, demonstrating a need for moderator analyses. The sources of variability in the assessment of offenders have been explored by others (Andrews, Bonta, Wormith, Guzzo, Brew, Rettinger, and Rowe 2011) and can include the type of sample (e.g., sex offender versus general offender), situational context (e.g., community or prison), and allegiance (e.g., author of instrument involved). Our moderator analyses confirm many of the findings reported by Andrews, Bonta et al. (2011).

Peer review status was the most consistent moderator in the prediction of general recidivism. Non-peer reviewed studies demonstrated higher predictive validity estimates for five of the seven central eight risk/ need factors that had significant variability (see Table 4). Although published status has been considered a proxy for study quality for treatment evaluation meta-analyses (Lipsey and Wilson 1993), the finding that poorer methodology results in greater effect sizes has not been replicated in applied prediction meta-analyses (e.g., Goggin 1995; Grove, Zald, Lebow, Snitz, and Nelson 2000). Although there are few clear guidelines in the prediction meta-analysis literature regarding assessing studies for methodological rigour (see Singh and Fazel 2009; Singh, Grann, and Fazel 2011), this reverse publication bias does not appear to be attributable to common methodological sources of variability in effect sizes (e.g., length of follow up, base rates, study setting, country).

One possible explanation is the influence of the administrator of the risk assessment (e.g., training, experience, conscientiousness). The non-peer reviewed studies consisted primarily of government reports. It could be assumed that the predictor variables in the government reports were coded by professionals trained extensively in the assessment of offenders (e.g., correctional or probation officers). This could lead to more conscientious, and therefore accurate, coding (Hanson, Harris, Scott, and Helmus 2007), as the results are used to guide treatment and supervision. Another possible consideration might be that the significant reverse publication bias is simply a (meaningless) statistical artefact that is due to random sampling error (Schmidt, Law, Hunter, Rothstein, Pearlman, and McDaniel 1993).

A few other moderators were related to the predictive validity of the central eight (e.g., setting, male sample) but two moderators deserve comment. When the developer(s) of the measure was involved in the study, then the predictive validity estimates were higher. Similar findings in the offender risk and treatment literature have been reported leading some to question whether this reflects a bias by the evaluators involved to inflate their findings (Fanelli 2009). However, others have argued that the higher validity estimates are more indicative of the originator/evaluator paying more attention to the integrity of assessments and program delivery (Harris, Rice, and Quinsey 2009; Lipsey 2009). In a recent study of the issue, Andrews, Bonta et al. (2011) found evaluator involvement as a "legitimate" source of variation in the predictive validity estimates of a widely used risk scale in Canada. By "legitimate" they meant a quality implementation practice that should be encouraged rather than "illegitimate" practices such as selective reporting or purposeful misrepresentation of the results. They also reported that studies conducted by Canadian researchers had higher validity estimates. We too found that three of the four tests of the central eight risk/need factors yielded higher effect sizes for Canadian studies compared to Australian studies. Although this pattern of results suggests a possible trend, where the central eight may be better predictors of recidivism for Aboriginal offenders in a Canadian context, more

research is needed, as only four factors could be assessed in this review. In all likelihood, the moderating effect of nationality is confounded by evaluator involvement (most of the developers of the measures in this review are Canadian).

The relative importance of risk/need factors

While criminal history, substance abuse, and antisocial personality pattern were predictive of general recidivism for Aboriginal offenders, they demonstrated significantly lower predictive validity estimates than for non-Aboriginal offenders. For the prediction of violent recidivism, there were no differences between Aboriginal and non-Aboriginal offenders on these variables. Although these findings for general recidivism may be attributable to heterogeneity among studies for criminal history and substance abuse (large and small amounts, respectively), a possible explanation for the lower predictive validity estimates for all three risk/need factors may be due to potential *ceiling effects*. These ceiling effects would have an impact on the d_{diff} score, as it is sensitive to variations in response base rates.

Specifically, the potentially high response base rates on these indicators among Aboriginal offenders may contribute to less variability, rendering the precision with which these factors are operationalized potentially inadequate for these offenders. For example, the lower predictive validity of criminal history could be due to a greater number of Aboriginal offenders that score high on individual criminal history factors, as it has been found that Aboriginal offenders tend to, for example, have more extensive involvement with the criminal justice system as youths, longer periods of incarceration, and more parole revocations compared to their non-Aboriginal counterparts (Office of the Correctional Investigator 2011). Similarly, the lower predictive validity for substance abuse may reflect the high base rate of alcohol and drug abuse in many Aboriginal communities. Although the Q was significant, the mean d_{diff} for substance abuse had a CI of 0.09 in width, which is considered to be a highly precise estimate with a high degree of replicability (Gendreau and Smith 2007).

For antisocial personality pattern, it is less clear why this factor was a poorer predictor for Aboriginal offenders, as it consists of several risk/ need factors from the central eight (e.g., education/employment, leisure); however, these findings may also be due to a possible ceiling effect. Although there were only four studies contributing to the d_{diff}

score, this predictor yielded non-significant heterogeneity, suggesting consistent findings among the studies included. In an effort to explore this finding further, we examined the factors that are subsumed within this predictor (according to the LS) by using the largest data set in our study, where antisocial personality pattern was assessed (i.e., Brews 2009). This enabled us to explore, albeit preliminarily, whether a possible ceiling effect (i.e., significantly higher response base rate for Aboriginal offenders) could be contributing to a disparity in the predictive validity for antisocial personality pattern between the two groups. Comparing the findings for Aboriginal (N = 296) and Caucasian offenders (N = 1743), we found that Aboriginal offenders were significantly more likely to demonstrate early and diverse antisocial behaviour, criminal attitudes, and a pattern of generalized trouble, traits that comprise the antisocial personality pattern sub-scale. Although this is a preliminary explanation, it lends some support to the notion of a potential ceiling effect. Clearly, more research is needed to allow for a more precise and specific understanding of why these factors are less predictive for Aboriginal offenders.

Study limitations

Although the pattern of results was generally supportive of the importance of the central eight, there was considerable between-study variability. The *Q* statistic was found to be significant for all of the eight central eight risk/need factors except for antisocial personality pattern; this was the case only in the prediction of general recidivism. Despite the variability, which points to a need for more studies, a test of the file drawer problem suggests that a considerable number of studies finding a null effect are needed to reverse the pattern of results found in this meta-analysis (e.g., at least 62 studies for the variable leisure/ recreation and more than 242 for criminal history).

One of the striking gaps in the empirical research is the absence of predictive studies on Aboriginal-specific factors such as cultural identity, living on a reserve, and feelings of social marginalization. Rugge (2006) noted the lack of research in this area in her narrative review and not much has changed since then. Thus, we were unable to test empirically the potential of Aboriginal-specific factors to predict recidivism. More empirical research regarding recidivism prediction, with regards to both culturally specific factors as well as more generic factors from a variety of Aboriginal groups (e.g., by country of origin and/or Nation) is needed to advance knowledge in this field. We were unable to examine the possibility of moderator effects on all of the potential predictors selected in this study. As noted earlier, both emotional and victim predicted general recidivism and victim predicted violent recidivism, albeit at a very modest level. Feminist scholars have argued that these factors are particularly important for women offenders (Hannah-Moffat 2009; Holtfreter and Cupp 2007). However, the evidence in support of this hypothesis has thus far been elusive (Andrews, Guzzo et al. 2011). We would have liked to test the possibility that gender may play a moderating role for these two variables, but we did not have the minimum number of studies required.

Moving forward

The present results confront a larger issue with respect to risk assessment of Aboriginal offenders. The issue is the avoidance of taking what we know about risk/need factors with non-Aboriginal offenders and applying it to Aboriginal offenders. Without a doubt, Aboriginal offenders have been socially, culturally, and economically marginalized (Archambeault 2003). Aboriginal leaders have been working hard to restore the power imbalance between the Aboriginal and non-Aboriginal communities through political activism (e.g., the creation of the territory of Nunavut) and economic opportunities (e.g., the Cree agreement with Hydro Quebec). One important way of improving the lives of Aboriginal peoples is to strengthen Aboriginal identity. This approach may be a double-edged sword. On the one hand, encouraging Aboriginal identity increases Aboriginals' pride in their heritage and culturally enriches their lives. On the other hand, it runs the risk that anything that comes from the dominant non-Aboriginal Canadian culture cannot benefit the Aboriginal community.

In the area of offender risk assessment, there is an undercurrent that the risk/need factors identified for non-Aboriginal offenders cannot possibly be relevant for Aboriginal offenders (Maynard et al., 1999). Thus, any risk instrument that is to be used for Aboriginal offenders should be developed from the ground up and consist of factors that are culturally relevant. As this review has shown, there is no apparent reason to ignore the central eight risk/need factors when assessing risk with Aboriginal offenders. Furthermore, despite all the rhetoric about the importance of Aboriginal identity, or any other Aboriginal-specific factor, we were unable to locate a single study to clearly demonstrate that factors related to Aboriginal identity are influential in recidivism prediction. There remains a clear need for empirical research examining the predictive validity of culturally specific, generic, and central eight risk/need factors with Aboriginal offenders. There is another force operating against adopting risk instruments developed on non-Aboriginal offenders. The risk assessments place the Aboriginal offender in an unfavourable light, as most risk instruments score Aboriginal offenders higher risk than non-Aboriginal offenders (e.g., Bonta et al. 1997; Helmus, Babchishin, and Blais 2011; Hsu, Caputi, and Byrne 2010). The argument is then made that this is unfair to Aboriginal offenders because their economic and social circumstances, which underpin many of the risk/need factors, are beyond their control. Furthermore, if their economic and social needs could be addressed then they would not be higher risk. This argument diverts attention away from addressing criminogenic needs to seeking social justice. However, we see no reason why both cannot be addressed simultaneously.

Perhaps the most important implication from the present meta-analysis is that the central eight risk/need factors are valid predictors of recidivism for Aboriginal offenders. The failure to use risk instruments that tap into the central eight with Aboriginal offenders runs the risk of over-classification. Previous research has shown that, in the absence of objective risk assessment, one is left to rely on professional judgement and this leads to unnecessary placement of offenders into a higher security (Bonta and Motiuk 1992). In addition, assessment instruments that measure the central eight provide guidance in the delivery of effective treatment programs. Knowledge of the major criminogenic needs of the offenders can serve as treatment targets, and there is now considerable evidence that programs that address these needs yield lower recidivism (Andrews and Bonta 2010). All of this can only benefit Aboriginal offenders.

Note

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References

(*denotes studies in the meta-analysis from which effect sizes were derived)

- *Allan, Alfred and Deborah Dawson
 - 2002 Developing a Unique Risk of Violence Tool for Australian Indigenous Offenders. Canberra, Australia: Criminology Research Council. (CRC 6/00-01)
- *Anastasopoulos, Vanessa and Paul Wheatley
 - 2006 Evaluation of the Impact of the Aboriginal Justice Strategy on Rates of Re-offending. Ottawa: Department of Justice Canada.
- Andrews, Donald A.
 - 1982 Level of Supervision Inventory (LSI): The first follow-up. Toronto: Ontario Ministry of Correctional Services.
- Andrews, Donald A. and James Bonta1995 Level of Service Inventory Revised. Toronto: Multi-Health Systems.
- Andrews, Donald A. and James Bonta
 - 2010 The Psychology of Criminal Conduct. 5th ed. New Providence, NJ: LexisNexis; Bender.
- Andrews, Donald A., James Bonta, and J. Stephen Wormith
- 1995 Level of Service Inventory Ontario Revision (LSI-OR): Interview and scoring guide. Toronto: Ontario Ministry of the Solicitor General and Correctional Services.

Andrews, Donald A., James Bonta, and J. Stephen Wormith

2004 Level of Service/Case Management Inventory: An offender assessment system. Toronto: Multi-Health.

Andrews, Donald A., James Bonta, J. Stephen Wormith, Lina Guzzo, Albert Brews, Jill Rettinger, and Robert Rowe

2011 Sources of variability in estimates of predictive validity: A specification with the Level of Service general risk/need. Criminal Justice and Behavior 38 (5): 413–32. http://dx.doi.org/10.1177/ 0093854811401990.

Andrews, Donald A., Craig Dowden, and Jill L. Rettinger

2001 Special populations within corrections. In Corrections in Canada: Social Reactions to Crime, ed. John A. Winterdyk. Toronto: Prentice-Hall.

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Andrews, Donald A., Lina Guzzo, Peter Raynor, Robert C. Rowe, Jill L. Rettinger, Albert Brews, and J. Stephen Wormith

2011 Are the major risk/need factors predictive of both female and male reoffending? A test with the eight domains of the Level of Service/ Case Management Inventory. International Journal of Offender Therapy and Comparative Criminology. http://dx.doi.org/10.1177/ 0306624X10395716.

Archambeault, William

2003 The Web of steel and the heart of the eagle: The contextual interface of American corrections and Native Americans. Prison Journal 83 (1): 3–25. http://dx.doi.org/10.1177/0032885502250376.

Armitage, Andrew

1995 Comparing the Policy of Aboriginal Assimilation: Australia, Canada, and New Zealand. Vancouver: UBC.

Blais, Julie, Holly A. Wilson, and James Bonta

2011, June

The prediction of criminal and violent recidivism among mentally disordered offenders: An up-dated meta-analysis. Paper presented at the Annual conference of the Canadian Psychological Association, Toronto.

Blanchette, Kelley and Laurence L. Motiuk

2004 Taking down the straw man: A reply to Webster and Doob. Canadian Journal of Criminology and Criminal Justice 46 (5): 621–30. http://dx.doi.org/10.3138/cjccj.46.5.621.

*Boer, Alexandra

unpublished

Evaluating the Static-99 and Static-2002 Risk Scales using Canadian sexual offenders. PhD Diss., University of Leicester. (dataset)

*Bonta, James

1989 Native inmates: Institutional response, risk, and needs. Canadian Journal of Criminology 31: 49–62.

Bonta, James

1997 Do we need theory for offender risk assessment? CSC Forum 9. http://www.csc-scc.gc.ca/text/pblct/forum/e091/091i_e.pdf.

Bonta, James

2002 Offender risk assessment: Guidelines for selection and use. Criminal Justice and Behavior 29 (4): 355–79. http://dx.doi.org/10.1177/0093854802029004002.

*Bonta, James, Carol LaPrairie, and Suzanne Wallace-Capretta

1997 Risk prediction and reoffending: Aboriginal and non-Aboriginal offenders. Canadian Journal of Criminology 39: 127-44. (dataset)

Bonta, James, Moira Law, and R. Karl Hanson

1998 The prediction of criminal and violent recidivism among mentally disordered offenders: A meta-analysis. Psychological Bulletin 123 (2): 123–42. http://dx.doi.org/10.1037/0033-2909.123.2.123.

*Bonta, James, Stan Lipinski, and Michael Martin

1992 The characteristics of Aboriginal recidivists. Canadian Journal of Criminology 34: 517–21.

Bonta, James and Laurence L. Motiuk

1992 Inmate classification. Journal of Criminal Justice 20 (4): 343–53. http://dx.doi.org/10.1016/0047-2352(92)90018-5.

*Bonta, James and Tanya Rugge

unpublished

The prediction of recidivism with Aboriginal Offenders. Ottawa: Public Safety Canada. (dataset)

*Bonta, James and Annie K. Yessine

2006 Tracking high-risk, violent offenders: An examination of the National Flagging System. Canadian Journal of Criminology and Criminal Justice 48: 573–607. (dataset)

*Brews, Albert

unpublished

The Level of Service Inventory and Female Offenders: Addressing Issues of Reliability and Predictive Validity. Masters thesis, Saskatoon, University of Saskatchewan. (dataset)

*British Columbia

unpublished

Female and Male Community Risk Needs Assessment: Data from Aboriginal Offenders Assessed in 1998 (Research Report). Victoria, BC: Public Safety and Solicitor General, Corrections Branch.

*Broadhurst, Roderick and Nini Loh

1995 Rearrest probabilities for the 1984–1993 apprehended western Australian population: A survival analysis. Journal of Quantitative Criminology 11 (3): 289–313. http://dx.doi.org/10.1007/BF02221141.

*Broadhurst, Roderick G., Ross A. Maller, Maxwell G. Maller, and Jennifer Duffecy

1988 Aboriginal and nonaboriginal recidivism in western Australia – A failure rate analysis. Journal of Research in Crime and Delinquency 25 (1): 83–108. http://dx.doi.org/10.1177/0022427888025001005.

*Buchanan, Kimberly

unpublished

Risk Assessment and Spousal Violence: Predictive Validity and Cultural Applicability. PhD diss., University of Regina, Regina.

Burgess, Ernest W.

1928 Factors determining success or failure on parole. In The workings of the indeterminate sentence law and the parole system in Illinois, ed. A.A. Bruce, A.J. Harno, E.W. Burgess, and J. Landesco, 221–34. Springfield, IL: State Board of Parole.

Calverly, Donna

2010 Adult correctional services in Canada, 2008/2009. Juristat 30: 1-32.

Canada

1996 Bridging the Cultural Divide: A Report on Aboriginal People and Justice in Canada. Royal Commission on Aboriginal Peoples. René Dussault and George Erasmus, Chairs.

*Cockram, Judith

2005 Careers of offenders with an intellectual disability: The probabilities of rearrest. Journal of Intellectual Disability Research 49 (7): 525–36. http://dx.doi.org/10.1111/j.1365-2788.2005.00707.x.

Cohen, Jacob

1988 Statistical Power Analysis for the Behavioral Sciences. 2nd ed. New York: Academic.

Cohen, Jacob

1994 The Earth is round (p < .05). American Psychologist 49 (12): 997– 1003. http://dx.doi.org/10.1037/0003-066X.49.12.997.

Correctional Service of Canada (CSC)

no date

Standard Operating Practice 700-4.

Debidin, Mia

2009 A Compendium of Research and Analysis on the Offender Assessment System (OASys) 2006–2009. London, UK: Ministry of Justice.

Dowden, Craig and Ralph Serin

2000 Assessing the needs of Aboriginal women offenders on conditional release. Forum on Corrections Research 12: 57–60.

*Dunnet, Allison

unpublished

The Cedar Project: Vulnerability to Recidivism among Aboriginal Young People Who Use Drugs. Masters thesis, Simon Fraser University, Burnaby, BC.

Fanelli, Daniele

2009 How many scientists fabricate and falsify research? A systematic review and meta-analysis of survey data. PLOS ONE 4 (5): e5738. http://dx.doi.org/10.1371/journal.pone.0005738.

*Ferrante, Anna, Nini Loh, and Maxwell Maller

1999 Measurement of the Recidivism of Offenders Attending the Kimberley Offender Program. Crawley, WA: University of Western Australia.

Fleiss, Joseph L.

1994 Measures of effect size for categorical data. In Handbook of Research Synthesis, ed. H. Cooper and L.V. Hedges. New York: Russell.

Gendreau, Paul, Tracy Little, and Claire Goggin

1996 A meta-analysis of the predictors of adult offender recidivism: What works! Criminology 34 (4): 575–607. http://dx.doi.org/10.1111/j.1745-9125.1996.tb01220.x.

Gendreau, Paul and Paula Smith

2007 Influencing the "people who count": Some perspectives on the reporting of meta-analytic results for prediction and treatment outcomes with offenders. Criminal Justice and Behavior 34 (12): 1536–59. http://dx.doi.org/10.1177/0093854807307025.

- Goggin, Claire
- unpublished

Prediction of Psychiatric Rehospitalization: A Meta-Analysis. Masters thesis, University of New Brunswick, Fredericton, NB.

*Gossner, Delphine and J. Stephen Wormith

2007 The prediction of recidivism among young offenders in Saskatchewan. Canadian Journal of Police and Security Services 5: 70–82.

*Grant, Brian, Yvonne Stys, Laura Dunbar, and Marsha Axford

2011 Low-risk Federal Offenders: Characteristics and Community Outcomes. (Research Report) Ottawa: Correctional Services of Canada, Research Branch. (dataset)

Greenfield, Lawrence and Steven Smith

1999 American Indians and Crime. Washington: U.S. Department of Justice, Office of Justice Programs.

*Gross, Adrienne L. and Margaret Sroga

2008 Establishing the needs of Aboriginal Offenders using the Level of Service Inventory – Ontario Revision. Unpublished manuscript.

Grove, William M., David H. Zald, Boyd S. Lebow, Beth E. Snitz, and Chad Nelson

- 2000 Clinical Versus Mechanical Prediction: A Meta-Analysis. Psychological Assessment 12 (1): 19–30. http://dx.doi.org/10.1037/1040-3590.12.1.19.
- *Haag, Andrew

unpublished

Do Psychological Interventions Impact on Actuarial Measures? An Analysis of the Predictive Validity of the Static-99 and Static-2002 on a Reconviction Measure of Sexual Recidivism. University of Calgary, Calgary, AB. (dataset)

*Hann, Robert G. and William G. Harman

1993 Predicting Release Risk for Aboriginal Penitentiary Inmates (User Report No. 1993–12). Ottawa: Solicitor General Canada. (dataset)

Hannah-Moffat, Kelly

2009 Gridlock or mutability: Reconsidering "gender" and risk assessment. Criminology and Public Policy 8 (1): 209–19. http://dx.doi.org/ 10.1111/j.1745-9133.2009.00549.x.

- Hannah-Moffat, Kelly and Margaret Shaw
 - 2001 Taking Risks: Incorporating Gender and Culture into the Classification and Assessment of Federally Sentenced Women in Canada. (Policy Research Report). Ottawa: Status of Women Canada.

Hanson, R. Karl and Monique T. Bussière

1998 Predicting relapse: A meta-analysis of sexual offender recidivism studies. Journal of Consulting and Clinical Psychology 66 (2): 348-62. http://dx.doi.org/10.1037/0022-006X.66.2.348.

Hanson, R. Karl and Kelly Morton-Bourgon

- 2005 The characteristics of persistent sexual offenders: A meta-analysis of recidivism studies. Journal of Consulting and Clinical Psychology 73 (6): 1154–63. http://dx.doi.org/10.1037/0022-006X.73.6.1154.
- Hanson, R. Karl and Kelly Morton-Bourgon
 - 2009 The accuracy of recidivism risk assessments for sexual offenders: A meta-analysis of 118 prediction studies. Psychological Assessment 21 (1): 1–21. http://dx.doi.org/10.1037/a0014421.
- Hanson, R. Karl, Andrew J.R. Harris, Terri-Lynne Scott, and Leslie Helmus
 2007 Assessing the Risk of Sexual Offenders on Community Supervision: The Dynamic Supervision Project. (User Report 2007–05). Ottawa: Public Safety Canada.

Harris, Grant T., Marnie E. Rice, and Vernon L. Quinsey

2010 Allegiance or fidelity: A clarifying reply. Clinical Psychology: Science and Practice 17 (1): 82–89. http://dx.doi.org/10.1111/j.1468-2850.2009.01197.x.

Hasselblad, Vic and Larry Hedges

- 1995 Meta-analysis of screening and diagnostic tests. Psychological Bulletin 117 (1): 167–78. http://dx.doi.org/10.1037/0033-2909.117.1.167.
- Hedges, Larry V. and Ingram Olkin
 - 1985 Statistical Methods for Meta-analysis. San Diego, CA: Academic.

Hedges, Larry V. and Jack L. Vevea

1998 Fixed- and random-effects models in meta-analysis. Psychological Methods 3 (4): 486–504. http://dx.doi.org/10.1037/1082-989X.3.4.486.

Helmus, Leslie, Kelly Babchishin, and Julie Blais

2011 Predictive accuracy of dynamic risk factors for Aboriginal and non-Aboriginal sex offenders: An exploratory comparison using STABLE- 2007. International Journal of Offender Therapy and Comparative Criminology 56: 1–21.

*Helmus, Leslie, and R. Karl Hanson

- 2007 Predictive validity of the Static-99 and Static-2002 for sex offenders on community supervision. *Sexual Offender Treatment* 2: 1–14. (dataset)
- *Hilton, Zoe N., Grant T. Harris, Suzanne Popham, and Carol Lang.
 - 2009 Risk Assessment among Incarcerated Domestic Offenders across Follow-Up Times and Case Criteria. Unpublished Manuscript, Waypoint Centre for Mental Health Care, Penetanguishene, ON.
- *Holsinger, Alexander M., Christopher T. Lowenkamp, and Edward J. Latessa 2006 Exploring the validity of the Level of Service Inventory – Revised with Native American offenders. Journal of Criminal Justice 34 (3): 331–37. http://dx.doi.org/10.1016/j.jcrimjus.2006.03.009.
- Hoffman, Peter B.
 - 1994 Twenty years of operational use of a risk prediction instrument: The United States Parole Commission's Salient Factor Score. Journal of Criminal Justice 22 (6): 477–94. http://dx.doi.org/10.1016/0047-2352(94)90090-6.
- Holtfreter, Kristy and Rhonda Cupp
 - 2007 Gender and risk assessment: The empirical status of the LSI-R for women. Journal of Contemporary Criminal Justice 23 (4): 363–82. http://dx.doi.org/10.1177/1043986207309436.

Holtfreter, Kristy, Michael D. Reisig, and Merry Morash

2004 Poverty, state capital, and recidivism among women offenders. Criminology and Public Policy 3 (2): 185–209. http://dx.doi.org/10.1111/ j.1745-9133.2004.tb00035.x.

*Hsu, Ching-I, Peter Caputi, and Michelle K. Byrne

2010 Level of Service Inventory – Revised: Assessing the risk and need characteristics of Australian Indigenous offenders. Psychiatry, Psychology and Law 17 (3): 355–67. http://dx.doi.org/10.1080/13218710903089261.

Huedo-Medina, Tania B., Julio Sánchez-Meca, Fulgencio Marín-Martínez, and Juan Botella

2006 Assessing heterogeneity in meta-analysis: Q statistic or *I*² index? Psychological Methods 11 (2): 193–206. http://dx.doi.org/10.1037/1082-989X.11.2.193.

Hunter, John E. and Frank L. Schmidt

1996 Cumulative research knowledge and social policy formulation: The critical role of meta-analysis. Psychology, Public Policy, and Law 2 (2): 324–47. http://dx.doi.org/10.1037/1076-8971.2.2.324.

Kashani, Javad H. and Wesley D. Allan

1998 The Impact of Family Violence on Children and Adolescents. Thousand Oaks, CA: Sage.

LaPrairie, Carol

1995 Seen but Not Heard: Native People in the Inner City. Ottawa: Department of Justice.

Ley, Philip

1972 Quantitative Aspects of Psychological Assessment: An Introduction. London: Duckworth.

Lipsey, Mark W.

- 2009 The primary factors that characterize effective interventions with juvenile offenders: A meta-analytic overview. Victims and Offenders 4 (2): 124–47. http://dx.doi.org/10.1080/15564880802612573.
- Lipsey, Mark W. and David B. Wilson
 - 1993 The efficacy of psychological, educational, and behavioural treatment: Confirmation from meta-analysis. American Psychologist 48 (12): 1181–209. http://dx.doi.org/10.1037/0003-066X.48.12.1181.
- Lipsey, Mark W. and David B. Wilson
 - 2001 Practical Meta-Analysis. Thousand Oaks, CA: Sage.
- Lowenkamp, Christopher T., Alexander M. Holsinger, and Edward J. Latessa 2001 Risk/need assessment, offender classification, and the role of childhood abuse. Criminal Justice and Behavior 28 (5): 543–63. http:// dx.doi.org/10.1177/009385480102800501.
- *Luong, Duyen and J. Stephen Wormith
 - 2011 Applying risk/need assessment to probation practice and its impact on the recidivism of young offenders. Criminal Justice and Behavior 38 (12): 1177–99. http://dx.doi.org/10.1177/0093854811421596.

Martel, Joane, Renée Brassard, and Mylène Jaccoud

2011 When two worlds collide: Aboriginal risk management in Canadian corrections. British Journal of Criminology 51 (2): 235–55. http://dx.doi.org/10.1093/bjc/azr003.

Maynard, Kristen, Branko Coebergh, Brendan Anstiss, Leon Bakker, and Terry Huriwai

1999 Ki Te Arotu – Toward a New Assessment: The identification of cultural factors which may pre-dispose Maori to crime. Journal of New Zealand 13: 42–58.

*McCluskey, Ken W., Philip A. Baker, and Andrea L. McCluskey

2005 Creative problem solving with marginalized populations: Reclaiming lost prizes through in-the-trenches interventions. Gifted Child Quarterly 49 (4): 330–41. http://dx.doi.org/10.1177/001698620504900406.

*McKinnon, Lauren J.

unpublished

Predicting Risk of Violence in a Young Offender Population: The Predictive Validity of the PCL:YV and the YLS/CMI. Masters thesis, Lakehead University, Thunder Bay, ON.

*Meyers, Joanna R. and Fred Schmidt

2008 Predictive validity of the Structures Assessment for Violence Risk in Youth (SAVRY) with juvenile offenders. Criminal Justice and Behavior 35 (3): 344–55. http://dx.doi.org/10.1177/0093854807311972.

*Nafekh, Mark and Laurence L. Motiuk

2002 The Statistical Information on Recidivism – Revised 1 (SIR-R1) scale: A Psychometric Examination. Ottawa, ON: Correctional Service of Canada.

*Nicholaichuk, Terry

2001, November

The comparison of two standardized risk assessment instruments in a sample of Canadian Aboriginal sexual offenders. Paper presented at the Annual Conference of the Association for the Treatment of Sexual Abusers, San Antonio, Texas. (dataset)

*Northern Territory Office of Crime Prevention

2005, June

Recidivism in the Northern Territory: Adult prisoners released in 2001–2. Paper presented at the Safety Crime and Justice: From Data to Policy Conference, Canberra, Australia.

Nuffield, Joan

1982 Parole Decision-Making in Canada. Ottawa: Solicitor General Canada.

*O'Byrne, Patrick L.

unpublished

Exploring the Predictive Ability of Risk Needs Assessment in Saskatchewan Corrections. Masters thesis, University of Regina, Regina.

Office of the Correctional Investigator

2011 Annual Report of the Correctional Investigator 2010–2011. Ottawa: Public Works. http://www.oci-bec.gc.ca/rpt/annrpt/ annrpt20102011-eng.aspx.

Orwin, Robert G.

1983 A fail-safe *N* for effect size in meta-analysis. Journal of Educational Statistics 8 (2): 157–59. http://dx.doi.org/10.2307/1164923.

*Percival, Christel S

unpublished

Testing Braithwaite's Theory of Reintegrative Shaming through Data on the Circle Sentencing Program in the Yukon. PhD diss., University of Hawai'i, Waikiki, Hawaii.

Perreault, Samuel

2009 The incarceration of Aboriginal people in adult correctional services. Juristat 29 (3).

Public Safety Canada

2010 Corrections and Conditional Release Statistical Overview: Annual Report. Ottawa: Public Safety Canada.

*Putnins, Aldis L.

2005 Assessing recidivism risk among young offenders. Australian and New Zealand Journal of Criminology 38 (3): 324–39. http://dx.doi.org/10.1375/acri.38.3.324.

*Rector, Brian, J. Stephen Wormith, and Dorothy D. Banka

2007, June

Predictive validity of the LSI-SK Youth Edition. Paper presented at Level of Service Inventory: Risk/Need Assessment of Female, Young and Aboriginal Offenders, Symposium conducted at the First North American Correctional and Criminal Justice Psychology Conference, Ottawa. D.A. Andrews (Chair).

*Rettinger, Jill L.

unpublished

A Recidivism Follow-Up Study Investigating Risk and Need within a Sample of Provincially Sentenced Women. PhD Diss., Carleton University, Ottawa. (dataset)

*Roeger, Leigh S.

1994 The effectiveness of criminal-justice sanctions for Aboriginal offenders. Australian and New Zealand Journal of Criminology 27 (3): 264–81. http://dx.doi.org/10.1177/000486589402700304.

Rosenthal, Robert

1979 The "file drawer" problem and tolerance for null results. Psychological Bulletin 86 (3): 638–41. http://dx.doi.org/10.1037/0033-2909.86.3.638.

Rugge, Tanya

- 2006 Risk Assessment of Male Aboriginal Offenders: A 2006 Perspective. (Research Report No. 2006–01). Ottawa: Public Safety Canada.
- Sánchez-Meca, Julio, Fulgencio Marín-Martínez, and Salvador Chacón-Moscoso 2003 Effect-size indices for dichotomized outcomes in meta-analysis. Psychological Methods 8 (4): 448–67. http://dx.doi.org/10.1037/1082-989X.8.4.448.

Samuelson, Les

- 1993 Aboriginal Policing Issues: A Comparison of Canada and Australia. Ottawa, ON: Solicitor General of Canada.
- Schmidt, Frank L.
 - 1992 What do data really mean? Research findings, meta-analysis, and cumulative knowledge in psychology. American Psychologist 47 (10): 1173–81. http://dx.doi.org/10.1037/0003-066X.47.10.1173.

Schmidt, Frank L., Kenneth Law, John E. Hunter, Hannah R. Rothstein, Kenneth Pearlman, and Michael McDaniel

- 1993 Refinements in validity generalization methods: Implications for the situational specificity hypothesis. Journal of Applied Psychology 78 (1): 3–12. http://dx.doi.org/10.1037/0021-9010.78.1.3.
- *Schmidt, Fred, Lauren McKinnon, Harpreet K. Chattha, and Keith Brownlee 2006 Concurrent and predictive validity of the Psychopathy Checklist: Youth version across gender and ethnicity. Psychological Assessment 18 (4): 393–401. http://dx.doi.org/10.1037/1040-3590.18.4.393.

*Schwalbe, Craig S.

2009 Risk assessment stability: A revalidation study of the Arizona Risk/ Needs Assessment Instrument. Research on Social Work Practice 19 (2): 205–13. http://dx.doi.org/10.1177/1049731508317297.

- Singh, Jay P. and Seena Fazel
 - 2009 Forensic risk assessment: A metareview. Criminal Justice and Behavior 37: 965–88.
- Singh, Jay P., Martin Grann, and Seena Fazel
 - 2011 A comparative study of violence risk assessment tools: A systematic review and metaregression analysis of 68 studies involving 25,980 participants. Clinical Psychology Review 31: 499–513.

Smith, Paula, Francis T. Cullen, and Edward J. Latessa

2009 Can 14,373 women be wrong? A meta-analysis of the LSI-R and recidivism for female offenders. Criminology and Public Policy 8 (1): 183–208. http://dx.doi.org/10.1111/j.1745-9133.2009.00551.x.

*Stockdale, Keira, Mark E. Olver, and Stephen Wong

- 2010 The Psychopathy Checklist: Youth Version and adolescent and adult recidivism: Considerations with respect to gender, ethnicity, and age. Psychological Assessment 22 (4): 768–81. http://dx.doi.org/10.1037/a0020044.
- Stripe, Tania S. and Lana E. Stermac
 - 2003 An exploration of childhood victimization and family-of-origin characteristics of sexual abuse against children. International Journal of Offender Therapy and Comparative Criminology 47: 542–55. http:// dx.doi.org/10.1177/0306624X03253316.

*Tanasichuk, Carrie L. and J. Stephen Wormith

2009 The predictive validity of the level of service inventory – Ontario Revision (LSI-OR) with Aboriginal offenders. (Research Report). North Bay, ON: Ministry of Community Safety and Correctional Services. (dataset)

*Trevethan, Shelley, John-Patrick Moore, and Nicole N. Allegri

2005 The "In Search of Your Warrior" Program for Aboriginal offenders: A preliminary evaluation. (Research Report No. R-172). Ottawa: Correctional Services of Canada.

Waldram, James

1992, November

Cultural profiling and the forensic treatment of Aboriginal offenders in Canada. Paper presented to the American Society of Criminology, New Orleans.

Webster, Cheryl M. and Anthony N. Doob

- 2004 Classification without validity or equity: An empirical examination of the Custody Rating Scale for federally sentenced women offenders in Canada. Canadian Journal of Criminology and Criminal Justice 46 (4): 395–422. http://dx.doi.org/10.3138/cjccj.46.4.395.
- Welsh, Andrew and James Ogloff
 - 2008 Progressive reforms or maintaining the status quo? An empirical evaluation of the judicial consideration of Aboriginal status in sentencing decisions. Canadian Journal of Criminology and Criminal Justice 50 (4): 491–517. http://dx.doi.org/10.3138/cjccj.50.4.491.
- Whiteacre, Kevin W.
 - 2006 Testing the Level of Service Inventory Revised (LSI-R) for racial/ ethnic bias. Criminal Justice Policy Review 17 (3): 330–342. http:// dx.doi.org/10.1177/0887403405284766.
- Wolf, Fredric M.
 - 1986 Meta-analysis: Quantitative Methods for Research Synthesis. Beverly Hills, CA: Sage.

Wormith, J. Stephen, Myles Ferguson, and James Bonta

in press

Offender classification and case management and their application in Canadian corrections. Adult corrections in Canada, ed. John Winterdyk and Michael Weinrath. Whitby, ON: de Sitter.

*Wormith, J. Stephen and Mark E. Olver

2002 Offender treatment attrition and its relationship with risk, responsivity and recidivism." Criminal Justice and Behavior 29 (4): 447–71. http://dx.doi.org/10.1177/0093854802029004006.

Yessine, Annie K. and James Bonta

2009 The offending trajectories of youthful Aboriginal offenders. Canadian Journal of Criminology and Criminal Justice 51 (4): 435–72. http://dx.doi.org/10.3138/cjccj.51.4.435.

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