

# CORRECTIONAL SERVICE CANADA

CHANGING LIVES. PROTECTING CANADIANS.



## RESEARCH REPORT

### Assessing Susceptibility to Group-Based Influence

**2017 N° R-390**

Ce rapport est également disponible en français. Pour en obtenir un exemplaire, veuillez vous adresser à la Direction de la recherche, Service correctionnel du Canada, 340, avenue Laurier Ouest, Ottawa (Ontario) K1A 0P9.

This report is also available in French. Should additional copies be required, they can be obtained from the Research Branch, Correctional Service of Canada, 340 Laurier Ave. West, Ottawa, Ontario K1A 0P9.



Correctional Service  
Canada

Service correctionnel  
Canada

Canada



# **Assessing Susceptibility to Group-Based Influence**

Terri Scott

Correctional Service of Canada

July 2017



## **Acknowledgements**

The author would like to thank Andrew Harris for his contributions during the conceptualization stage of this project, as well as Maaïke Helmus for her work on the preliminary data extraction. As well, I would like to thank Leslie Anne Keown for insight on data analyses and Lynn Stewart for her editorial comments. A great deal of thanks goes to both Yvonne Stys and Rick McEachran for the valuable knowledge and expertise they shared at each stage of the process, as well as their continued support, without whom this project would not have been possible. Finally, thank you to Defence Research and Development Canada's (DRDC) Centre for Security Science for their continued financial support.



## Executive Summary

**Key words:** *radicalized offenders, security threat groups, assessment, susceptibility*

Despite representing a relatively small percent of the total offender population, the presence of offenders with radical beliefs and ideologies is an area worthy of attention, particularly for the potential threat they pose both within the custodial context, as well as in the community upon release (Stys, McEachran, & Axford, 2016). Understanding the factors that put offenders at an increased risk of becoming engaged with a radicalized or other Security Threat Group (STG) is an important first step in being able to mitigate the risk they pose. The primary purpose of this study was to determine if an assessment of susceptibility to group-based influence among Canadian federal offenders was possible using administrative data collected upon intake.

A total of 1,495 offenders admitted to custody between January 3, 2003 and August 17, 2014, with a validated Security Threat Group (STG) affiliation or identified as radicalized were combined to form the STG group for this study. A group of non-STG affiliated offenders comprised the comparison group ( $n = 14,754$ ). The STG and comparison group were further split into a development and a validation sample. A total of 300 predictor variables comprised of indicators from the intake assessment were selected for analysis.

The majority of the offenders in the study were male (94.0%). When disaggregated by groups most individuals in the radicalized group were categorized as ‘other’ ethnicity while the largest proportion of offenders in the other STG and comparison groups were Caucasian. Offenders in the STG group had the youngest mean age of 28.8 years, compared to the radicalized ( $M = 31.2$  years) and comparison ( $M = 36.6$  years) groups.

A series of logistic regression analyses were used to reduce the number of predictor variables and identify items contributing to the prediction of the STG affiliation. The final model selected included items that clustered on the following categories: *violence and victims, employment history, antisocial history and attitudes*, and *criminal history*. Using simple summation to calculate an overall total score for all items, the  $AUC$  was .76 in the development sample, with only a small reduction in predictive accuracy demonstrated by an  $AUC = .74$ . These values are considered suggestive of a large effect size, meaning these items strongly predict and are related to being involved in an STG. The subscale with the highest predictive accuracy was *antisocial associates and attitudes* with an  $AUC$  value of .77 (development) and .76 (validation).

The results of this preliminary work are promising and in a direction that is consistent with similar research in the field (e.g., Skillicorn et al., 2015). What remains to be determined is the best combination of factors that suggest a risk of being involved in a security threat group, and more specifically, involved with radicalized groups. Overall, the data available for this study lacked the precision needed to signal definitive areas of concern for vulnerabilities to specific group-based influence. The small sample identified as radicalized did not allow for disaggregated analysis. However, this study was an important first step in refining the notion of susceptibility and has identified a need to approach the measurement in a more operationalized and systematic way.





## Table of Contents

Acknowledgements .....	ii
Executive Summary .....	iii
List of Tables .....	v
List of Appendices .....	vi
Introduction.....	1
Hypothesized factors associated with susceptibility .....	3
Purpose.....	6
Method .....	7
Measures/Predictor Variables .....	7
Analysis.....	8
Results .....	10
Bivariate Analysis for Item Reduction .....	11
Principal Components Analysis (PCA) for Item Reduction .....	12
Refinement of Final Predictors .....	12
Predictive Accuracy and Validation of Final Predictors and Sub-Scales .....	14
Distribution of Groups on Sub-Scales and Total Score .....	16
Discussion .....	18
Recommendations .....	21
References .....	22



## List of Tables

Table 1 <i>Demographic Profile of Comparison, Radicalized, and Other Security Threat Groups (STG)</i> .....	11
Table 2 <i>Interim Sub-Scales and Predictors Resulting from PCA Item Reduction</i> .....	13
Table 3 <i>Final Predictors that Formed the Sub-Scales and Total Score to Predict Involvement in an STG</i> .....	14
Table 4 <i>Predictive Validity of Sub-Scales and Total Score for the Development and Validation Samples</i> .....	15
Table 5 <i>Sub-Scales and Final Predictors Across Comparison, Radicalized, and Other STG Groups</i> .....	17



## **List of Appendices**

Appendix A: Bivariate Analysis Using Simple Logistic Regression to Measure Strength of Association Between Predictor and Group Membership (STG Affiliated or Comparison) .	25
Appendix B: Variables Retained for Principal Components Analysis .....	36



## **Introduction**

Although still a relatively small percent of the federal Canadian offender population (Skillicorn, Leuprecht, Stys & Gobeil, 2015), the presence of offenders with radical beliefs and ideologies is an area of significant concern due to the threat they pose within the custodial context and in the community upon release (Stys, McEachran, & Axford, in press). Understanding the factors that put offenders at an increased risk of becoming engaged in a Security Threat Group (STG) is an important first step in being able to mitigate the risk they pose.

Within the Correctional Service of Canada (CSC) an STG is defined as:

any formal or informal ongoing inmate/offender group, gang, organization or association consisting of three or more members. Most security threat groups encountered in a correctional setting fall into one of the following basic categories: street gangs, prison gangs, outlaw motorcycle gangs, traditional organized crime, Aboriginal gangs, white supremacy groups, subversive groups, terrorist organizations and hate groups (CSC, 2016, p.7).

Prison environments, though necessarily restrictive, are described by some as incubators (Sinai, 2014) or possible breeding grounds for radicalized offenders or other STGs (Silber & Bhatt, 2007). Described as a captive audience (p. 114), Cilluffo, Cardash, and Whitehead (2007) believe offenders possess desirable characteristics that render them vulnerable to radicalization such as alienation, anti-social attitudes, cultural disillusionment, violent tendencies, and importantly social isolation. The “pains of imprisonment” are delineated by Hannah, Clutterbuck, and Rubin (2008) as separation from supportive relationships, threats to personal identity and masculinity, deprivation of personal autonomy, insecurity and violence, and rejection and/or separation from a dominant group and moral code. Faced with these realities of incarceration, it is posited that offenders may look to others within their immediate environment as role models and/or ways of coping with their situation or to secure goods or gain protection from others in the environment (Veldhuis, 2015). The need to seek others creates a certain vulnerability and opportunity to engage with individuals who may be involved in an STG. For radicalization in particular, the occurrence of individuals taking up a radical cause in prison is hard to measure, therefore much about when, how, and for whom radicalization is likely to occur

is unknown (Veldhuis, 2015). However, a recent review of best practices obtained from questionnaire responses of operational experts suggests that radicalization in a prison setting is a relatively low occurrence (Axford, Stys, & McEachran, 2015), one of the reasons why it is a difficult construct to measure (Monahan, 2012).

Choudhury (2007) speaks to the importance of the individual identity in this process for those individuals open to exploring and adopting radical ideologies:

*First, the path to radicalization often involves a search for identity at a moment of crisis. Whilst defining oneself is part of the normal process of identity-formation amongst young people, for those who are at risk of radicalisation, this process creates a ‘cognitive opening’, a moment when previous explanations and belief systems are found to be inadequate in explaining an individual’s experience” (italics in original, p. 6).*

Some theorize that individuals seek out other like-minded individuals in a quest for personal significance or to give meaning to the uncertainty in their life (Hogg, Kruglanski, & van den Bos, 2013). However, characteristics of the individual are only one part of the equation; experiences of overcrowding, discrimination, harsh confinement conditions, gang dynamics, and charismatic leadership may play a critical role in creating ideal circumstances for vulnerable individuals in prison to become susceptible to radicalization (Veldhuis, 2015) or involvement in STGs. Further, as Borum (2015) explains, the pathway to radicalization occurs over time and is not the result of a single decision. Borum (2014) describes terrorism or extremism as a fluid construct and suggests that consideration of an individual’s level of involvement needs to be made; that is, how the individual becomes involved in extremism and/or stay involved, and any changes or desistance in his or her involvement needs to be considered. To further complicate our understanding of this process, Borum also argues that “people can radicalize without becoming terrorists, and people can become terrorists without radicalizing” (2015, p.67).

Imprisonment can create vulnerability within individuals with its associated uncertainties, but as Cilluffo and colleagues (2007) point out, when released from correctional institutions, offenders remain a vulnerable target:

[H]aving served their sentence, individuals often leave prison with very little financial, emotional, or familial support. Where support does exist, it is often provided by community and religious groups. Extremist groups can masquerade as legitimate support organizations in order to build ties with former prisoners (p. 115).



Whether individuals are newly admitted into the correctional system or they are being released back into the community after having served time in custody, there is a need to identify those most at risk or susceptible to recruitment to an STG. Currently, this is a process that is not well understood beyond the consideration of some of the individual and environmental characteristics described briefly above. Attempts to piece together a greater understanding of the susceptibility to group-based influence have suggested the following factors that have garnered preliminary support in the research literature.

### **Hypothesized factors associated with susceptibility**

To situate the discussion on the hypothesized factors associated with susceptibility a definition of key constructs is warranted. First, a risk factor, as defined by Kraemer, Kazdin, Offord, Kessler, Jensen, & Kupfer (1997) is a variable that “(a) *statistically correlates* with the outcome (in this case, violence) and also (b) *precedes* the outcome in time” (italics and emphasis in the original, p.172). Kraemer and colleagues are careful to point out that this definition does not imply that the risk factor in any sense “causes” the occurrence of the outcome. Conversely, in addition to factors that increase the “risk” associated with vulnerability and susceptibility, there is a need also to consider how some of these factors may “protect” against becoming vulnerable or susceptible to group-based influence (i.e., protective or strength factors). In general, the presence of a strength factor can counteract or even mitigate the presence of risk factors; it is not simply the absence of a risk factor. As Borum (2015) suggests, these could include an individual’s commitment to conventional norms or activities incompatible with radicalization or violence or, as reported by Hall, Simon, Lee, and Mercy (2012), could include factors such as school commitment, academic achievement, and low peer delinquency, factors that have demonstrated a protective effect among youth at risk for violence.

Perhaps more nebulous, is the construct of vulnerability or susceptibility. Horgan (2014) claims a vulnerability to be “the state of openness to attack, harm, or damage”, which shapes attitudes, control over impulses and behaviour, and/or appraisals of threats and grievances. As previously highlighted, these individual factors are then influenced by situational and contextual factors. In sum, Borum (2014) posits that to understand an individual’s vulnerability or susceptibility to radicalizing influences or the ideologies of another STG, there is a need to

consider the mindset which can affect how the individual interprets and responds to situations. Then, to understand the particular factor(s) that incite an individual's propensity to a radicalizing or another STG influence, the factor(s) cannot be considered in isolation from one another; that is, there is a need to understand how the individual, situational, environmental factors come together to encourage individuals to affiliate or become involved with extremists or other STGs.

Recent research has suggested a variety of factors that identify individuals who are vulnerable or susceptible to group-based influence, particularly those who come to be associated with extremist groups. A review by Monahan (2012) summarized several indicators of particular relevance to engagement in extremist behaviours, which are centralized around four broad categories: moral emotions, grievances, affiliations, and ideology.

Moral emotions or negative emotionality (Borum, 2014) includes feelings such as anger, hate, and humiliation (Borum, 2015). It is hypothesized that an emotional vulnerability (Horgan, 2008; Horgan, 2014) creates a "cognitive opening" prompting an individual's receptivity to new ideas, influences, and/or alternate worldviews, whereby the individual becomes susceptible to group-based influence (Borum, 2014).

A perceived injustice (Veldhuis, 2015) or grievance is another type of indicator of susceptibility that has been widely discussed in the literature. The category of grievances can include both personal (e.g., harm to self or loved ones) and group grievances (e.g., threat or harm to a group or cause the individual cares about). It is thought that a particular injustice or grievance contributes to vengeance or negative emotionality thus affecting an individual's susceptibility to group-based influence through emotional vulnerability (Borum, 2014; Monahan, 2012).

Several researchers have identified the connection to like-minded others in the study of group-based influence. Specific indicators centred around affiliations are kinship or other social ties to those experiencing similar issues (Horgan, 2008), need for belongingness (Borum, 2014; Veldhuis, 2015), social pressure or "group think" (Veldhuis, 2015), and the presence of charismatic leadership (Veldhuis, 2015). As Borum (2014) argues, the need for belonging is a strong and an important determinant in a very social process, where vulnerable individuals will join in groups for the connection to others. Hall et al. (2012) emphasized once again the importance of peer delinquency as a risk factor in youth violence as well as the negative influence that the presence of neighbourhood youth in trouble can have on increased risk for

violence.

Other research suggests that the same social processes underlie both susceptibility to radicalizing influences and other STG groups (Goldman, 2014; Wood, 2014). Though these scholars all recognize the importance of individual and environmental factors in influencing engagement with STGs, the significance of social factors is emphasized by many who study this phenomenon. Both Goldman (2014) and Wood (2014) speak to the importance of social identity in their discussion of why individuals join gangs, particularly among youth who as part of forming their identities, seek out like-minded individuals. In their study of radicalized offenders, Stys et al. (2014) found evidence supporting Hannah, Clutterbuck and Rubin's contention (2008) that most individuals in prison are susceptible to group-based influence by the very nature of being in prison, that is, incarceration creates a certain vulnerability among individuals, thus increasing their likelihood of engaging with STGs. Results of focus groups conducted by Stys et al. (2014) highlighted important similarities between radicalized offenders and other security threat groups (i.e., gangs). Specifically, individuals who are viewed as weak and easily influenced or looking for a connection/belongingness are targets for recruitment into these groups. Importantly, whether they are being targeted by violent extremists or street gangs, they still pose a threat to the safety and security of the institution based on their potential for increased violence (Stys et al., 2014). In the presence of negative influences and charismatic leaders, it could just as easily be a radicalized group or another STG that individuals turn to for security, protection, and a sense of belonging.

Beyond these general categories of indicators summarized above, a number of additional factors have been identified in the literature. However, as noted in a recent comprehensive review by Stys, Gobeil, Harris, and Michel (2014), many of these factors rely on untested theories. Because the base rate of the event (i.e., terrorist activity) is very rare, the ability to empirically validate these factors is limited (Monahan, 2012). What remains to be determined is the best combination of the most promising factors to ensure the greatest success in identifying individuals who may be susceptible to group-based influence. The important in-depth overview of the research literature by Stys et al. (2014) provided the foundation for the current study. Their work provided a more global understanding of factors related to susceptibility and allowed us to test a model based on theoretical constructs that were derived out of the research literature.

**Purpose**

The primary goal of this study was to determine if an assessment of susceptibility to group-based influence in general could be developed using administrative data routinely collected on offenders upon intake into federal custody. Identifying those at risk of becoming involved with STGs within the correctional context could allow for implementation of prevention and/or intervention strategies to deter recruitment of vulnerable individuals.

## Method

### Participants

The population of offenders with an STG designation validated by the Security Branch of the CSC, including offenders identified as “radicalized”<sup>1</sup> in previous research conducted by Stys et al. (2014) and Stys and Michel (2014) were included in this study. Only those offenders who were admitted to custody between January 3, 2003 and August 17, 2014 who had a verified gang-affiliated designation (i.e., any identification of affiliation, no matter when it occurred) or identified as radicalized, and who had a valid *Dynamic Factor Intake Assessment – Revised* (DFIA-R; Brown & Motiuk, 2005) assessment were retained for analysis as the STG group. Given the research that suggests the process of engaging with security threat groups is very similar for both susceptibility to radicalizing influence and other STGs, a decision was made to combine the radicalized offenders together with other STG affiliated offenders to ensure sufficient numbers for meaningful analysis. The combined STG affiliated group totaled 1,495 offenders (2.3% women and 97.7% men; 40.0% Indigenous). Using the same study parameters as the STG affiliated group, a comparison group of non-STG affiliated offenders was selected resulting in a total of 14,754 offenders (6.0% women and 94.0% men; 21.3% Indigenous) in the comparison group.

### Measures

Given the goal of the present study was to develop a measure of susceptibility upon intake to federal custody, all predictors selected for analysis were based on information available upon admission to the institution, or shortly thereafter (i.e., within 90 days). The Offender Intake Assessment (OIA) process is a comprehensive evaluation of the offender that assesses information on criminal history (offence, sentencing) and other important socio-demographic factors (dynamic needs, physical and mental health, security, support, etc.) to provide a basis for determining risk and intervention needs (see Motiuk, 1997 for a detailed review of the OIA process). Once complete, the OIA informs the offender’s correctional plan by providing a measure of criminal (static) risk, dynamic risk, motivation level (i.e., commitment to the correctional plan), and reintegration potential (i.e., ability to reintegrate into community).

---

<sup>1</sup> A radicalized offender is defined as “an ideologically motivated offenders, who commits, aspires or conspires to commit, or promote, or promotes violent acts in order to achieve ideological objectives” (CSC, 2012)

One component of the OIA is the DFIA-R, which evaluates offenders on seven domains comprised of dichotomized indicators rated as “present” or “absent”. All offenders are rated on seven domains: employment, marital/family, associates/social interaction, substance abuse, community functioning, personal/emotional, and criminal attitudes.

Another measure within the OIA that contributes to the assessment of criminal risk is the Static Factor Assessment (SFA). The SFA is comprised of the criminal history record, offence severity record, and sex offence history checklist which consist of individual indicators that are scored on a dichotomous rating scale as “present” or “absent”.

Finally, the Custody Rating Scale (CRS), also measured at intake, is made up of two scales – institutional adjustment and security risk, which are combined to form a final score and penitentiary placement security classification (minimum, medium, or maximum), generated by the Offender Management System (CSC, 2014).

All data for this study were obtained from the Offender Management System (OMS), CSC’s electronic database that contains all assessment and offender information from intake into federal custody until warrant expiry, in addition to any further readmissions. In the case of multiple sentences, all data were extracted for the most recent sentence,

## **Analyses**

Data extraction and analysis were conducted using SAS (Version 9.4). When data extraction and cleaning was complete, there were initially 300 potential predictor variables comprised of the OIA indicators (DFIA-R, SFA), CRS (custody rating, institutional adjustment, and security risk score), offender demographic information (age, race, gender, religion, marital status), and offence and sentencing variables (type of offence, sentence length) considered for analysis. As a first step in the reduction of the number of potential predictor variables, simple logistic regression was used to determine bivariate relationships with the outcome variable (involvement in STGs, which included the radicalized group). Based on the results of the bivariate analysis, variables were retained if the odds ratio was greater than 1.5, consistent with a small effect size (Chen, Cohen, & Chen, 2010; Cohen, 1992). The first stage of data reduction also involved discussion with the project team on the relative importance of certain predictor variables over others. Specifically, if consensus was reached regarding the importance of a variable based on the existing research on susceptibility, it was retained. A total of 149 variables were retained following bivariate analysis.

The remaining variables were entered into a Principal Components Analysis<sup>2</sup> (PCA) in an attempt to reduce the items into more meaningful components that might comprise a scale capable of predicting involvement in an STG. Item reduction decisions were based on the size of factor loadings (greater than .4; Stevens, 2002). Eigenvalues, scree plots, and measures of communality were also considered in the decision to retain items. If items loaded on more than one component, even after considering a rotated solution, they were removed and the PCA was re-run. This process was repeated until a simple solution was determined.

Once the potential pool of predictors was reduced from the series of PCAs, inter-item correlations between items of each component were calculated to examine multi-collinearity. Finally, a series of logistic regressions was used to measure the ability of each component to predict involvement in an STG group. Area Under the Curve (*AUC*) from receiver operating characteristic curve analyses were examined to obtain a measure of predictive accuracy, as were Harrell's *c* from logistic regression analysis. *AUC* values vary between 0 and 1, with a value of .5 indicating the prediction of outcome is no greater than chance. Rough approximations as they relate to effect size are provided by Rice and Harris (2005) who indicated that .56, .64, and .71 reflect a small, moderate, and large effect size respectively. The same heuristics apply to the interpretation of Harrell's *c*. Chi-squares were also run to determine the ability of the items to distinguish the groups (comparison versus STG).

It was hoped that there would be sufficient sample sizes to explore models for different outcomes (i.e., radicalized versus STG, as well as ideological versus criminological motives). Unfortunately, this was not possible. As a result, the radicalized and STG groups were combined into the outcome group for all analyses. As well, the two groups (STG/radicalized offenders and comparison group) were further split into a development and a validation sample to test that the models generated from the development sample hold true using a separate sample. This process used a 50/50 split, to ensure there were sufficient cases in both groups for meaningful analyses resulting in a development sample of 8067 (7337 comparison and 730 STG) and a validation sample of 8182 (7417 comparison and 765 STG).

---

<sup>2</sup> Given that the variables in this study were not continuous (i.e., they were dichotomous or ordinal) and the limitations of the use of PCA with data of this nature, a tetrachoric/polychoric correlation matrix was calculated prior to running PCA in SAS. The use of a correlation matrix was done in an attempt to minimize error associated with extracted components (Holgado-Tello, Chacón-Moscoso, Barbero-García, & Vila-Abad, 2010; Kolenikov & Angeles, 2004; Kubinger, 2003).

## **Results**

Demographic information and most serious index offence by group: comparison, radicalized, and other STG are presented in Table 1. The radicalized and STG groups are disaggregated for descriptive purposes in Table 1 only and are combined for subsequent analyses.

Almost all of the offenders included in this study were men (94.0%). The largest proportion of individuals in the comparison and other STG group were Caucasian, while the majority of offenders in the radicalized group were categorized as 'other'. The STG offenders are the youngest of the three groups with a mean age of 28.8 years. The most serious index offence varied across the three groups and the aggregate sentence length on the most recent sentence was 3.9 years, 4.2 years, and 4.7 years for the comparison, radicalized, and other STG groups respectively.



Table 1

*Demographic Profile of Comparison, Radicalized, and Other STG*

	Comparison	Radicalized	Other STG
Age – <i>M (SD)</i>	36.6 (12.3)	31.2 (9.9)	28.8 (8.2)
		%	
Gender			
Men	94.0	100.0	97.6
Women	6.0	0.0	2.4
Race			
Caucasian	60.0	36.8	30.5
North American Indian <sup>a</sup>	14.5	0.0	29.4
Black	8.8	5.3	18.8
Métis	5.8	0.0	11.1
Other	11.0	57.9	10.2
Marital			
Married/common-law	41.3	31.6	52.0
Single	47.3	63.2	43.6
Divorced/separated	8.0	0.0	1.4
Widow	1.1	5.3	0.2
Most serious offence (index)			
Homicide	9.7	26.3	15.0
Sexual	15.5	5.3	1.8
Robbery	14.8	0.0	16.5
Drugs	22.7	21.2	21.3
Assault	12.1	0.0	18.3
Other violent	5.9	10.5	11.7
Property	10.9	0.0	5.5
Other non-violent	8.5	36.8	9.9

*Note.* STG = Security Threat Group. <sup>a</sup>As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

**Bivariate Analysis for Item Reduction**

A total of 300 predictors were examined using simple logistic regression to evaluate their relationship with the outcome (involvement in an STG). The results of these analyses are provided in Appendix A. Items with a significant odds ratio (confidence interval does not contain 0) greater than 1.5 were retained. As well, if consensus was reached among the project team regarding the importance of key variables in relation to susceptibility, these variables were also retained. Arguably, this method of variable reduction is subjective; however, decisions were empirically guided by the bivariate analysis. This initial process resulted in a total of 149 items being retained for Principal Components Analysis – see Appendix B.

### **Principal Components Analysis (PCA) for Item Reduction**

Inputting the 149 items, the first analysis of PCA identified 33 components to be retained by Eigenvalue greater than 1 criterion, with many variables loading on the first component; rotations did not offer much simpler interpretations. Given there were too many variables at this point to compile a meaningful solution, all significant factor loadings on the first component were removed (i.e., factor loadings greater than .4) and the PCA was again performed to determine if another component would emerge. This process was repeated two more times until a sufficient number of factors were no longer loading on the first component. All variables that were removed as significant loadings from these iterations were tested to see if they would emerge in a multi-component solution. Re-running the PCA resulted in a 13 component solution. In an attempt to better understand how these factors were loading across the components, a varimax, followed by promax, rotation was applied. Again, a 13-factor solution remained; however, variables loaded across the components into more meaningful, interpretable constructs. Any factors that did not load on a component, loaded on more than one component, or had a communality greater than 1, were removed from the potential pool of predictors and the PCA was re-run to refine the solution. This process was repeated until a final solution emerged, with all remaining items loading cleanly (i.e., on one component only and with an acceptable level of communality) for all remaining items. This resulted in a total of 54 items, which clustered into nine meaningful components.

### **Refinement of Final Predictors**

A backward selection logistic regression was run for each component to identify any items that were not significantly contributing to the ability of the component to predict the outcome (involvement in an STG). From this process, a further 22 items were removed resulting in a total of 32 items and 9 components. Inter-item correlations were also considered to examine for possible multi-collinearity. As a result, there were no correlations greater than .8 that would signal an indication of multi-collinearity, so no variables were removed for this reason.

Items were summed<sup>3</sup> into a total score for each component and given a name according to the properties of the items to form a potential sub-scale to predict involvement in an STG. A total score was also created by simple summation of each of the sub-scales. The sub-scales remaining

---

<sup>3</sup> Simple summation of items coded 0 or 1 was chosen over factor scores to replicate what would be simplest and most easily implemented should a scale of this nature be developed for use in the field in the future.

at this stage of analysis are listed in Table 2.

Table 2

*Interim Sub-Scales and Predictors Resulting from PCA Item Reduction*

	<i>n</i>	<i>OR</i>	95% <i>CI</i>	<i>c</i>
Violence and victims	7044	1.48	[1.39, 1.58]	.62
Substance abuse	6977	1.08	[1.03, 1.14]	.53
Employment history	6963	1.40	[1.33, 1.47]	.66
Self-regulation	7010	1.28	[1.21, 1.35]	.60
Community engagement	6952	1.63	[1.48, 1.79]	.61
Antisocial associates and attitudes	7011	2.16	[2.01, 2.31]	.77
Behaviour problems	7760	1.02	[0.94, 1.12]	.50
Criminal history	6973	1.71	[1.60, 1.82]	.68
Family	6690	2.29	[1.93, 2.72]	.58
<i>Total score</i>	<i>7760</i>	<i>1.11</i>	<i>[1.10, 1.13]</i>	<i>.70</i>

*Note.* *n* indicates total number of offenders in the development sample and includes the STG and comparison groups. *OR* = Odds Ratio; *CI* = Confidence Interval; *c* = Harrell's *c* from logistic regression. Total score is the simple summation of all items from the sub-scales.

In consideration of some of the low values of predictive accuracy indicated by from Harrell's *c* reported in Table 2, it was decided to see if a backwards elimination would retain all of the sub-scales in the model. The results suggested that the self-regulation and community engagement items should be removed from the model. Further consideration was also given to the sub-scales with predictive accuracy less than .6 (indicative of a small effect size or low predictive accuracy): substance abuse, behaviour problems, and family. When all five of these sub-scales were removed and the logistic regression re-run, the predictive accuracy of the total score improved, *OR* = 1.28, 95% *CI* [1.25, 1.30], *c* = .76. At this point, it was decided that the final model would include the items and sub-scales with the highest predictive accuracy, which are listed in Table 3.

Table 3

*Final Predictors that Formed the Sub-Scales and Total Score to Predict Involvement in an STG*

<b>Final Predictors and Sub-Scales</b>
<b>Violence and Victims</b>
Previous use of prohibited weapons [previous]
Violence used against victim [previous]
Weapons used against victim [previous]
Serious injury (wounding/maiming, disfiguring) to victim
<b>Employment History</b>
Employment history is absent?
Job history has been unstable?
Marketable job skills obtained through experience are limited?
Co-operative work skills are limited?
Work ethic can be described as poor?
<b>Antisocial History and Attitudes</b>
Has many criminal acquaintances?
Has many criminal friends?
Resides in a high crime area?
Displays negative attitudes towards the criminal justice system?
Takes pride in criminal exploits?
<b>Criminal History</b>
Scheduled convictions [youth]
Community supervision [youth]
Failure during community-based supervision [youth]

### **Predictive Accuracy and Validation of Final Predictors and Sub-Scales**

With the final predictors selected and totals calculated, values for the Area Under the Receiver Operating Characteristics Curve (*AUC ROC*) were requested from the logistic regression models. The *AUC* values, along with their 95% *CI* are presented in Table 4. All of the *AUC* values in this table reflect a moderate predictive accuracy of the items with the exception of Attitudes and Associates scale and the total score which reflect a large effect, according to heuristics approximated by Rice & Harris (2005) discussed previously. Also in Table 4 are the results from the validation sample ( $N = 8182$ ), which demonstrates only a small difference in values of *AUC* measuring predictive accuracy (i.e., shrinkage) on the sub-scales and total score between the development sample and the validation sample.

Table 4

*Predictive Validity of Sub-Scales and Total Score for the Development and Validation Samples*

	DEVELOPMENT					VALIDATION				
	<i>N</i>	<i>AUC</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>	<i>N</i>	<i>AUC</i>	<i>95% CI</i>	<i>OR</i>	<i>95% CI</i>
Violence and victims	7044	.62	[.63, .68]	1.48	[1.39, 1.58]	7091	.61	[.59, .63]	1.43	[1.34, 1.53]
Employment history	6963	.65	[.63, .68]	1.40	[1.33, 1.47]	6980	.63	[.61, .65]	1.35	[1.28, 1.42]
Antisocial associates & attitudes	7011	.77	[.76, .79]	2.16	[2.01, 2.31]	7038	.76	[.74, .78]	2.10	[1.96, 2.25]
Criminal history	6973	.67	[.65, .70]	1.71	[1.60, 1.82]	7024	.66	[.64, .68]	1.64	[1.54, 1.74]
<b>Total Score</b>	<b>7086</b>	<b>.76</b>	<b>[.74, .77]</b>	<b>1.28</b>	<b>[1.25, 1.30]</b>	<b>7123</b>	<b>.74</b>	<b>[.71, .75]</b>	<b>1.25</b>	<b>[1.22, 1.28]</b>

*Note.* *N* includes all offenders in the STG and comparison groups. *AUC* = Area under ROC curve; *95% CI* = confidence interval; *OR* = odds ratio. Total score is the simple summation of all items from the sub-scales.

### **Distribution of Groups on Sub-Scales and Total Score**

Originally, one goal of the study was to examine differences between STG groups (i.e., radicalized and gang-affiliated offenders), as well as between offenders with different motivations (e.g., ideological and criminological motives); however, the sample size was not large enough to allow for this detailed level of analysis. The groups used to form the overall STG group (comprised of radicalized and other STG offenders) and the comparison group are profiled on each of the final predictors in Table 5. It is interesting to note that the radicalized offenders appear to be scoring the lowest on the sub-scale totals compared to the other STG group and the comparison group and have lower percentages of items endorsed than the STG group. The scales Violence, Employment, and Criminal History are highest for the other STG group. Antisocial Associates and Attitudes although less prevalent within the radicalized group was a factor that had slightly higher predictability for the radicalized group than other factors. Interestingly this scale was the most significant predictor of involvement in an STG based on the large effects demonstrated in both the development and validation samples (*AUC* values of .76 and .74, respectively).

Table 5

*Sub-Scales and Final Predictors across Comparison, Radicalized, and Other STG Groups*

	Comparison	Radicalized	Other STG
<b>Violence and Victims – <i>M (SD)</i></b>	<b>0.83 (1.07)</b>	<b>0.45 (1.21)</b>	<b>1.36 (1.28)</b>
	% endorsed as “present”		
Use of prohibited weapons	7.5	10.5	17.5
Violence used against victim	38.7	5.3	56.2
Weapons used against victim	16.3	5.3	31.6
Serious injury (wounding/maiming, disfiguring) to victim	9.0	5.3	18.1
<b>Employment History - <i>M (SD)</i></b>	<b>1.69 (1.51)</b>	<b>2.00 (1.33)</b>	<b>2.48 (1.54)</b>
Employment history is absent	13.3	5.3	26.1
Job history has been unstable	56.1	47.4	74.2
Marketable job skills obtained through experience are limited	37.9	31.6	62.2
Co-operative work skills are limited	15.2	10.5	22.4
Work ethic can be described as poor	21.6	10.5	38.8
<b>Antisocial Associates &amp; Attitudes – <i>M (SD)</i></b>	<b>2.06 (1.44)</b>	<b>1.90 (1.20)</b>	<b>3.48 (1.10)</b>
Has many criminal acquaintances	57.9	42.1	88.5
Has many criminal friends	41.0	10.5	80.5
Resides in a high crime area	21.0	10.5	47.0
Displays negative attitudes towards the criminal justice system	47.0	26.3	68.7
Takes pride in criminal exploits	10.7	10.5	31.7
<b>Criminal History – <i>M (SD)</i></b>	<b>0.83 (1.16)</b>	<b>0.64 (1.12)</b>	<b>1.65 (1.29)</b>
Scheduled convictions [youth]	19.1	10.5	43.6
Community supervision y[youth]	31.3	15.8	58.7
Failure during community-based supervision [youth]	20.4	10.5	47.0
<b>Total Score</b>	<b>5.33 (3.76)</b>	<b>4.64 (3.70)</b>	<b>8.91 (3.72)</b>

*Note:* Predictors were rated as “present” or “absent”. The percentages presented in the table indicate the percent of individuals who are rated on the indicators as “present” at intake. Total score is the summation of all items included in the sub-scales.

## Discussion

Though the methods used in this study are exploratory in nature, the results provide some indication of variables that would flag potential risk for involvement in security threat groups. The results of this preliminary work show that involvement in an STG is related to factors easily scored from available administrative data collected at the time of intake into federal custody. The findings suggest that factors relating to previous violence, employment history, antisocial associates and attitudes, as well as previous criminal history, particularly factors related to involvement in crime as a youth could be key indicators related to being identified as involved in, or becoming at risk of being involved in, an STG.

An important next step would be to further test and refine the draft measure on a group of known radicalized offenders and compare the results to a group of other STG affiliates to determine any potential differences. A persistent problem with studies of this nature, however, is the relatively small number of documented radicalized offenders on which to base meaningful and statistically sound statistical analyses. As demonstrated in this study, the group of available non-radicalized STG affiliates was much larger than the radicalized affiliates. The results of this research demonstrated that there are important differences between other STG groups and radicalized offenders. This finding is consistent with relevant literature which suggests that radicalized offenders tend to be better educated (Benmelech & Berrebi, 2007; Silke, 2008), to come from a higher social status (Silke, 2008), to be younger (e.g., typically between 15 and 30 years of age; Silber & Bhatt, 2007; Silke, 2008), are male, and have little to no prior criminal history (Silber & Bhatt, 2007; Stys et al., 2014). These findings are qualified by some observations suggesting that higher education could also be a signal of commitment and ability to successfully carry out an attack (Benmelech & Berrebi, 2007). Further, it is proposed that these behaviours are most likely seen in men, possibly due to higher impulsivity, higher confidence, greater attraction to risk taking, and need for status, factors common to young men involved in deviancy in general (Silke, 2008). Importantly, however, there is a need to look at the difference in motivations of these individuals with radicalized or extremist views, who are primarily motivated by ideological, rather than economic, factors. Silke (2008) argues that further consideration needs to be made regarding factors that may drive loyalties such as social marginalization and a desire for revenge. As such, the commonly cited desistance factors such as



marriage, education, and employment do not appear to have the same impact on radicalized offenders, requiring the development of different models and theories to account for, and intervene with these individuals (Silke, 2008). Further work is necessary to understand identified differences between the radicalized offenders and non-radicalized STG-affiliated federal offenders so appropriate management and intervention strategies can be tailored to meet the specific needs of each group, if warranted.

Another interesting debate in the literature as it pertains to susceptibility is the psychological ‘normalcy’ of individuals involved in terrorism. Though there appears to be a consensus that most radicalized individuals who have engaged in acts of violence do not have a documented psychological disorder, there is some hesitation in describing individuals involved in terrorist activity as “normal” (Horgan, 2014). It has been suggested that committing acts of extremist violence requires discipline, rationality, self-control and mental stamina, which individuals with a mental illness would not be capable of (Silke, 2008). However, the actions themselves are not normal. Others have described these individuals as “unremarkable” – that is, “the majority of these individuals began as “unremarkable” – they had “unremarkable” jobs, had lived “unremarkable” lives and had little, if any criminal history” (Silber & Bhatt, 2007; p.6). Important to the study of how individuals become vulnerable to susceptibility, is Horgan’s (2014) argument that the emphasis should be less on how they become engaged in extremist violence and more on why they become radicalized. Further research to empirically validate factors that influence vulnerability to susceptibility specifically for radicalized offenders will contribute to this understanding.

This question of *why* individuals become terrorists can play an important role on the study of susceptibility of individuals to group-based influence. The results of this study suggest that information available from CSC’s automated database on offenders at intake into custody is distinguishing between a group of offenders known to be involved with an STG compared to non-affiliated offenders on indicators of violence, employment history, antisocial associates and attitudes, and youth criminal history. The variables are measuring a construct that distinguishes some differences between these groups. However, the statistical requirement to combine both radicalized offenders and other STG offenders into one group for our analysis made it impossible to determine if the proposed measure is predicting an offender’s susceptibility to becoming involved specifically in an ideologically-motivated radicalized group. Based on what is known

about radicalized offenders from the existing profiles, it appears that an *absence* of some of these factors (e.g., lower education, lifestyle instability) that we traditionally understand as risk factors for general criminality is important. Typically, these factors are considered in the assessment and management of risk for general criminality; however, the expression of these factors (e.g., highly educated) may be important factors to consider in the presence of radicalized or extremist beliefs. The primary purpose of the assessment tools in the OIA is to garner indications of risk for general criminality, meaning we look for the *presence* of these factors as an indicator of risk. As indicated above, the use of this data for a different purpose (i.e., to measure a vulnerability based on the absence of such factors) may not be a good fit.

Although capable of generating a measure of general criminality and risk for individuals involved in an STG, the administrative data analyzed was not well suited for measuring vulnerability for radicalizing influence.<sup>4</sup> This is still an operationally significant finding, as gang-affiliated STGs pose a considerable management challenge in the correctional context (Michel & Stys, 2015). Best practices for gang management have pointed to the importance of information sharing, collection of information on gangs and high quality security intelligence information, separation of gangs from the general population, provision of transition units for offenders wishing to disaffiliate from a gang, transfers to disrupt gang activity, integration of gang members into the general offender population, and building credibility and rapport among offenders as strategies (Michel & Stys, 2015). Being able to readily identify individuals most susceptible to group-based influence can assist in implementing some of these best practices in a timely manner to minimize the risk they pose to the safety and security of the institution.

The results of the current research suggest that the larger number of other STG offenders relative to the radicalized offenders are driving the results. Skillicorn et al. (2015) found similar results using OMS indicators in single value decomposition clustering (an extension of PCA) to create clusters representing similarities between offenders based on attributes. Their results identified differences between violent extremist offenders and the wider offender population, though these differences were small. The findings from the current study were in the same direction as those identified in the Skillicorn et al. (2015) study. Together, these results show that the data available from the OMS are capable of measuring factors that are associated with

---

<sup>4</sup> It should be acknowledged that some offenders enter CSC as known gang member affiliates which would have resulted in parole officers endorsing the indicators in the Associates domain related to affiliation with antisocial peers. This would possibly inflate the predictability of this factor.

affiliation with STGs, but lack the precision needed to signal areas of concern for potential vulnerabilities to group-based influence, particularly for specifically designated radicalized offenders compared with non-radicalized STG offenders.

### **Recommendations**

In order to obtain a true measure of susceptibility, there is a need to develop a measure of vulnerability specific to radicalized offenders, based on the current research.

This study attempted to make use of an administrative database that contains an abundance of information pertaining to offenders in federal custody, however, the data contained in this dataset are coded and collected for a very different purpose. Although there is some useful information that can be used to inform a study of susceptibility to general group-based influence, there is more work to be done and important questions remain.

There is a need to operationalize vulnerability to susceptibility. A standardized measure of susceptibility to group-based influence would assist in defining this construct in a more operationalized and systematic way. Obtaining a more concrete measure of indicators of susceptibility will allow for the organization to use a specialized assessment or enhance one that already exists, such as the OIA, to better equip the Service in identifying individuals who may be susceptible to becoming involved in STGs. It is anticipated that this work would move beyond administrative data that is conveniently available, to the collection of more in-depth information available from offender file reviews or interviews to focus on empirically derived or theoretically informed indicators of susceptibility.

## References

- Axford, M., Stys, Y., & McEachran, R. (2015). International Consultation: Best Practices in the Management of Radicalized Offenders (Research Report R-361). Ottawa, Ontario: Correctional Service of Canada.
- Benmelech, E. & Berrebi, C. (2007). Human capital and the productivity of suicide bombers. *Journal of Economic Perspectives*, 21(3), 223-238.
- Borum, R. (2014). Psychological vulnerabilities and propensities for involvement in violent extremism. *Behavioral Sciences and the Law*, 32, 286-305. DOI: 10.1002/bsl.2110
- Borum, R. (2015). Assessing risk for terrorism involvement. *Journal of Threat Assessment and Management*, 2 (2), 63-87. DOI: 10.1037/tam0000043.
- Brown, S. L., & Motiuk, L. L. (2005). *The Dynamic Factors Identification and Analysis (DFIA) component of the offender intake assessment (OIA) process: A meta-analytic, psychometric and consultative review*. Ottawa, ON: Correctional Service of Canada.
- Chen, H., Cohen, P., & Chen, S. (2010). How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics – Simulation and Computation*, 39, 860-864.
- Choudhury, T. (2007). *The role of Muslim identity politics in radicalisation (a study in progress)*. Department for Communities and Local Government: London, UK.
- Cilluffo, F. J., Cardash, S. L., & Whitehead, A. J. (2007). Radicalization: Behind bars and beyond borders. *Brown Journal of World Affairs*, 13(2), 113-122.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 1, 155-159.
- Correctional Service of Canada (2012). *Radicalization Strategy Working Group Definition*. Author, Ottawa, ON.
- Correctional Service of Canada (2014). *Commissioner's directive 705-7: Security classification and penitentiary placement*. Author, Ottawa, ON.
- Correctional Service of Canada (2016). *Commissioner's directive 568-3: Identification and Management of Security Threat Groups*. Author, Ottawa, ON.
- Goldman, L., Giles, H., & Hogg, M. A. (2014). Going to extremes: Social identity and communication processes associated with gang membership. *Group Processes & Intergroup Relations*, 17(6), 813-832. doi: 10.1177/136843021452489.

- Hall, J. E., Simon, T. R., Lee, R. D., & Mercy, J. A. (2012). Implications in the direct protective factors for public health research and prevention strategies to reduce youth violence. *American Journal of Preventative Medicine*, 43 (2S1), S76-S83).  
doi: 10.1016/j.amepre.2012.04.019
- Hannah, G., Clutterbuck, L., & Rubin, J. (2008). *Radicalization or rehabilitation: Understanding the challenge of extremist and radicalized prisoners*. Retrieved from RAND cooperation website:  
[http://rand.org/content/dam/rand/pubs/technical\\_reports/2008/RAND\\_TR571.pdf](http://rand.org/content/dam/rand/pubs/technical_reports/2008/RAND_TR571.pdf)
- Holgado-Tello, F. P., Chacón-Moscoso, S., Barbero-García, I., & Villa-Abad, E. (2010). Polychoric versus pearson correlations in exploratory and confirmatory factor analysis of ordinal variables. *Quality and Quantity*, 44, 153-166. doi: 10.1007/211135-008-9190-y
- Hogg, M. A., Kruglanski, A., & van den Bos, K. (2013). Uncertainty and the roots of extremism. *Journal of Social Issues*, 69(3), 407-418.
- Horgan, J. (2008). From profiles to *pathways* and roots to *routes*: Perspectives from psychology on radicalization into terrorism. *Annals of the American Association of Political and Social Sciences*, 618, 80–94. doi:10.1177/0002716208317539
- Horgan, J. (2014). *The psychology of terrorism*. New York, NY: Routledge.
- Kolenikov, S. & Angeles, G. (2004). *The use of discrete data in PCA: Theory, simulations, and applications to socioeconomic indices*. Retrieved from Measure Evaluation website:  
<http://www.cpc.unc.edu/measure/resources/publications/wp-04-85>
- Kraemer, H., Kazdin, A., Offord, D., Kessler, R., Jensen, P., & Kupfer, D. (1997). Coming to terms with the terms of risk. *Archives of General Psychiatry*, 54, 337–343.
- Kubinger, K. D. (2003). On artificial results due to using factor analysis for dichotomous variables. *Psychology Science*, 45,1, 106-110.
- Michel, S., & Stys, Y. (2015). Criminal organizations: An examination of gang management practices inside Canadian institutions (Research Report, R-347). Ottawa, ON: Correctional Service Canada.
- Monahan, J. (2012). The individual risk assessment of terrorism. *Psychology, Public Policy, and Law*, 18(2), 167-205.
- Motiuk, L. L. (1997). Classification for correctional programming: The offender intake assessment (OIA) process. *Forum on Corrections Research*, 9, 18-22.

- Rice, M. E., & Harris, G. T. (2005). Comparing effect sizes in follow-up studies: ROC area, Cohen's *d*, and *r*. *Law and Human Behavior*, 29, 615-620. doi:10.1007/s10979-005-6832-7
- Silber, M. D. & Bhatt, A. (2007). *Radicalization in the west: The homegrown threat*. Retrieved from New York City Police Department website:  
[http://www.nyc.gov/html/nypd/downloads/pdf/public\\_information/NYPD\\_Report-Radicalization\\_in\\_the\\_West.pdf](http://www.nyc.gov/html/nypd/downloads/pdf/public_information/NYPD_Report-Radicalization_in_the_West.pdf)
- Silke, A. (2008). Holy warriors: Exploring the psychological processes of Jihadi radicalization. *European Journal of Criminology*, 5, 99-123. doi: 10.1177/1477370807084226
- Sinai, J. (2014). Developing a model of prison radicalisation. In A. Silke (Ed.), *Prisons, Terrorism, and Extremism – Critical Issues in Management, Radicalisation and Reform* (pp. 35-46).
- Skillicorn, D. B., Leuprecht, C., Stys, Y., & Gobeil, R. (2015). Structural differences of violent extremist offenders in correctional settings. *Global Crime*, 1-20.  
doi:17440572.2015.1052224.
- Stevens, J. P. (2002). *Applied multivariate statistics for the social sciences*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.  
DOI: 10.1080/17440572.2015.1052224
- Stys, Y., Gobeil, R., Harris, A. J. R., & Michel, S. (2014). *Violent extremists in federal institutions: Estimating radicalization and susceptibility to radicalization in the federal offender population*. (Research Report No. R-313). Ottawa, ON: Correctional Service of Canada.
- Stys, Y., McEachran, R., & Axford, M. (2016). *Ways forward: Applying lessons learned in the management of radicalized offenders to Canadian federal corrections*. Ottawa ON: Correctional Service of Canada.
- Stys, Y., & Michel, S. (2014). *Examining the needs and motivations of Canada's federally incarcerated radicalized offenders*. (Research Report No. R-344). Ottawa, ON: Correctional Service of Canada.
- Veldhuis, T. M. (2015). *Captivated by fear*. University of Groningen, Netherlands.
- Wood, J. L. (2014). Understanding gang membership: The significance of group processes. *Group Processes & Intergroup relations*, 17(6), 710-729. doi: 10.1177/1368130214550344.

**Appendix A: Bivariate Analysis Using Simple Logistic Regression**  
**to Measure Strength of Association between Predictor and Group Membership (STG Affiliated or Comparison)**

	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
1.	Aboriginal – yes/no	8067	allstg	2.607	2.227	3.052	<.0001
2.	Race – white vs. all other	8013	allstg	0.270	0.228	0.319	<.0001
3.	Race – North American Indian <sup>a</sup> vs. all other	8013	allstg	2.612	2.201	3.091	<.0001
4.	Race – Black vs. all other	8013	allstg	2.571	2.100	3.128	<.0001
5.	Race – Métis vs. all other	8013	allstg	1.900	1.452	2.453	<.0001
6.	Race – Other vs. all other	8013	allstg	0.904	0.698	1.154	.4300
7.	Marital status at intake	8067	allstg				
	<i>Single vs. married/CL</i>			0.760	0.650	0.889	.0006
	<i>Div./sep. vs. married/CL</i>			0.113	0.051	0.213	<.0001
	<i>Widow vs. married/CL</i>			0.176	0.029	0.558	.0152
	<i>‘Other’ vs. married/CL</i>			0.850	0.514	1.331	.5007
8.	Christian – yes/no	7457	allstg	0.445	0.378	0.524	<.0001
9.	Buddhist – yes/no	7457	allstg	1.754	1.067	2.742	.0191
10.	Hindu – yes/no	7454	allstg	0.639	0.035	3.132	.6642
11.	Jewish – yes/no	7457	allstg	0.652	0.158	1.780	.4727
12.	Muslim – yes/no	7457	allstg	2.099	1.616	2.694	<.0001
13.	Sikh – yes/no	7457	allstg	1.084	0.451	2.212	.8398
14.	Native spirit – yes/no	7457	allstg	2.706	2.098	3.455	<.0001
15.	Other religion – yes/no	7457	allstg	2.018	1.223	3.174	.0037
16.	No religious affiliation – yes/no	7457	allstg	1.210	1.009	1.444	.0370
17.	Age at admission	8067	allstg	0.924	0.915	0.933	<.0001
18.	Violent offence – yes/no	8067	allstg	1.312	1.121	1.539	.0008
19.	Homicide [index] – yes/no	8067	allstg	1.752	1.411	2.160	<.0001
20.	Sexual [index] – yes/no	8067	allstg	0.128	0.077	0.199	<.0001
21.	Robbery [index] – yes/no	8067	allstg	1.252	1.035	1.507	.0188
22.	Drug [index] – yes/no	8067	allstg	1.205	1.025	1.413	.0227
23.	Assault [index] – yes/no	8067	allstg	1.735	1.466	2.048	<.0001
24.	Other violent [index] – yes/no	8067	allstg	2.246	1.920	2.625	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
25.	Other non-violent [index] – yes/no	8067	allstg	1.302	1.116	1.521	.0008
26.	DFIA Employment – asset/no need/low need vs. some need/high need	7684	allstg	2.908	2.425	3.506	<.0001
27.	DFIA Marital/family – asset/no need/low need vs. some need/high need	7685	allstg	0.670	0.560	0.799	<.0001
28.	DFIA Associates – asset/no need/low need vs. some need/high need	7686	allstg	9.714	7.155	13.571	<.0001
29.	DFIA Substance abuse – asset/no need/low need vs. some need/high need	7686	allstg	0.826	0.707	0.967	.0169
30.	DFIA Community function – asset/no need/low need vs. some need/high need	7686	allstg	1.267	1.063	1.505	.0075
31.	DFIA Personal/emotional – asset/no need/low need vs. some need/high need	7688	allstg	0.938	0.787	1.121	.4758
32.	DFIA Attitudes – asset/no need/low need vs. some need/high need	7684	allstg	4.078	3.141	5.394	<.0001
33.	Has less than grade 10 or equivalent?	6741	allstg	1.642	1.393	1.938	<.0001
34.	Has less than high school diploma or equivalent?	6824	allstg	2.033	1.658	2.512	<.0001
35.	Employment history is absent?	6934	allstg	2.354	1.967	2.810	<.0001
36.	Unemployed at the time of arrest?	6909	allstg	1.926	1.609	2.317	<.0001
37.	Job history has been unstable?	6898	allstg	2.769	2.247	3.444	<.0001
38.	Marketable job skills obtained through experience are limited?	6857	allstg	2.935	2.471	2.471	<.0001
39.	Job skills obtained through formal training are limited?	6828	allstg	3.847	2.964	5.083	<.0001
40.	Dissatisfied with job skills?	6567	allstg	1.562	1.322	1.846	<.0001
41.	Co-operative work skills are limited?	6134	allstg	1.549	1.274	1.876	<.0001
42.	Belief in oneself to improve employability is low?	6621	allstg	1.353	1.095	1.661	.0044
43.	Work ethic can be described as poor?	6282	allstg	2.389	2.016	2.831	<.0001
44.	Has previously been referred to programs addressing deficit(s)?	6833	allstg	1.058	0.869	1.281	.5709
45.	Limited attachment to family unit during childhood?	6977	allstg	1.258	1.060	1.490	.0082
46.	Relations with parental figure were negative during childhood?	6926	allstg	1.164	0.990	1.367	.0653
47.	Abused during childhood?	6854	allstg	0.912	0.769	1.080	.2904
48.	Witnessed family violence during childhood?	6807	allstg	1.269	1.072	1.501	.0055
49.	Family members criminally active during childhood?	6690	allstg	2.292	1.927	2.722	<.0001
50.	Inability to maintain an enduring intimate relationship?	6832	allstg	0.842	0.696	1.014	.0732
51.	Intimate relationship(s) have been problematic?	6850	allstg	0.638	0.542	0.752	<.0001
52.	Victimized by spousal abuse?	6889	allstg	0.740	0.571	0.944	.0182
53.	Perpetrated spousal violence?	6825	allstg	0.825	0.692	0.979	.0293
54.	Attitudes support spousal violence?	6776	allstg	0.770	0.602	0.972	.0319
55.	Has no parental responsibilities?	6973	allstg	1.103	0.939	1.294	.2334
56.	Has significant difficulties handling parenting responsibilities?	6356	allstg	0.549	0.429	0.693	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.



	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
57.	Parental knowledge and/or skill is limited?	6211	allstg	0.996	0.805	1.225	.9726
58.	Formally investigated for suspicion of child abuse/neglect?	6664	allstg	0.275	0.167	0.424	<.0001
59.	Uses excessive force to discipline child?	6467	allstg	0.109	0.018	0.343	.0019
60.	Has previously been referred to programs addressing deficit(s)	6950	allstg	0.903	0.680	1.181	.4709
61.	Associates with substance abusers?	6898	allstg	2.488	1.981	3.162	<.0001
62.	Has many criminal acquaintances?	6860	allstg	23.264	14.010	42.605	<.0001
63.	Has many criminal friends?	6722	allstg	10.901	8.336	14.562	<.0001
64.	Has contact with criminal family members?	6822	allstg	3.271	2.768	3.863	<.0001
65.	Has a criminal partner?	6825	allstg	1.755	1.434	2.135	<.0001
66.	Suspected affiliation with street gang/organized crime?	6842	allstg	51.792	41.673	64.880	<.0001
67.	Resides in a high crime area?	6414	allstg	3.511	2.964	4.162	<.0001
68.	Prosocial support from an intimate partner is limited?	6792	allstg	0.990	0.841	1.168	.9072
69.	Prosocial family support is limited?	6822	allstg	1.325	1.120	1.565	.0010
70.	Prosocial support from friends is limited?	6692	allstg	3.370	2.664	4.321	<.0001
71.	Has previously been referred to programs addressing deficit(s)?	6945	allstg	1.235	0.967	1.560	.0831
72.	Early age alcohol use?	6886	allstg	1.245	1.058	1.466	.0084
73.	Frequently engages in binge drinking?	6825	allstg	1.026	0.866	1.212	.7678
74.	Has combined the use of alcohol and drugs?	6783	allstg	1.379	1.168	1.631	.0002
75.	Alcohol use interferes with employment?	6776	allstg	1.148	0.952	1.378	.1444
76.	Alcohol use interferes with interpersonal relationships?	6841	allstg	0.986	0.832	1.166	.8724
77.	Alcohol use interferes with physical or emotional well-being?	6840	allstg	0.880	0.739	1.045	.1492
78.	Excessive alcohol use is part of the offender's lifestyle?	6860	allstg	1.067	0.903	1.258	.4449
79.	Early age drug use?	6894	allstg	1.557	1.319	1.843	<.0001
80.	Has gone on drug-taking bouts or binges?	6826	allstg	0.850	0.721	1.001	.0515
81.	Has combined the use of different drugs?	6759	allstg	1.056	0.897	1.243	.5099
82.	Drug use interferes with employment?	6771	allstg	0.914	0.770	1.083	.3004
83.	Drug use interferes with interpersonal relationships?	6822	allstg	0.814	0.690	0.959	.0143
84.	Drug use interferes with physical or emotional well-being?	6843	allstg	0.837	0.709	0.987	.0350
85.	Regular drug use is part of the offender's lifestyle?	6884	allstg	1.257	1.068	1.481	.0062
86.	Alcohol or drug use has resulted in law violations?	6921	allstg	0.793	0.671	0.940	.0071
87.	Becomes violent when drinking or using drugs?	6638	allstg	1.157	0.981	1.363	.0824
88.	Alcohol and/or drug use is part of the offence cycle?	6845	allstg	0.767	0.652	0.904	.0015

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
89.	Has previously been referred to programs addressing deficit(s)?	6952	allstg	0.668	0.563	0.790	<.0001
90.	Unstable accommodation?	6934	allstg	1.412	1.197	1.662	<.0001
91.	Financial instability?	6943	allstg	1.495	1.259	1.782	<.0001
92.	Has used social assistance?	6698	allstg	0.812	0.690	0.956	.0125
93.	Constructive leisure activities are limited?	6816	allstg	1.804	1.526	2.139	<.0001
94.	Community attachment is limited?	6873	allstg	1.767	1.503	2.079	<.0001
95.	Use of community resources is limited?	6790	allstg	2.279	1.934	2.687	<.0001
96.	Has previously been referred to programs addressing deficit(s)?	6928	allstg	0.924	0.676	1.238	.6100
97.	Displays narrow and rigid thinking?	6952	allstg	1.523	1.296	1.791	<.0001
98.	Problem recognition skills are limited?	6972	allstg	1.348	1.136	1.605	.0007
99.	Ability to generate choices is limited?	6938	allstg	1.392	1.162	1.674	.0004
100.	Ability to link actions to consequences is limited?	6940	allstg	1.186	1.001	1.410	.0507
101.	Has difficulty coping with stress?	6823	allstg	0.677	0.575	0.798	<.0001
102.	Gives up easily when challenged?	6558	allstg	1.102	0.921	1.313	.2833
103.	Impulsive?	6941	allstg	1.308	1.089	1.578	.0045
104.	Engages in thrill seeking behaviour?	6830	allstg	2.249	1.912	2.648	<.0001
105.	Gambling has been problematic?	6779	allstg	0.874	0.592	1.248	.4789
106.	Has difficulty setting long-term goals?	6889	allstg	1.836	1.562	2.160	<.0001
107.	Has difficulty setting realistic goals?	6851	allstg	1.720	1.460	2.025	<.0001
108.	Time management skills are problematic?	6630	allstg	1.658	1.398	1.963	<.0001
109.	Assertiveness skills are limited?	6870	allstg	0.761	0.631	0.914	.0039
110.	Listening skills are limited?	6877	allstg	1.046	0.865	1.259	.6396
111.	Has difficulty solving interpersonal problems?	6916	allstg	0.978	0.828	1.159	.7970
112.	Manipulates others to achieve goals?	6757	allstg	1.341	1.138	1.579	.0004
113.	Empathy skills are limited	6846	allstg	1.769	1.490	2.106	<.0001
114.	Frequently feels intense anger?	6690	allstg	1.478	1.236	1.762	<.0001
115.	Frequently suppresses anger?	6580	allstg	1.349	1.120	1.617	.0014
116.	Frequently acts in an aggressive manner?	6868	allstg	2.163	1.840	2.544	<.0001
117.	Has low frustration tolerance?	6800	allstg	1.313	1.115	1.546	.0011
118.	Frequently interprets neutral situations as hostile?	6680	allstg	1.479	1.230	1.773	<.0001
119.	Has deviant sexual preferences?	6840	allstg	0.134	0.076	0.216	<.0001
120.	Displays deviant sexual attitudes?	6911	allstg	0.159	0.098	0.243	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
121. Has previously been referred to programs addressing deficit(s)?	6974	allstg	0.907	0.750	1.092	.3105
122. Displays negative attitudes towards the criminal justice system?	6983	allstg	2.677	2.228	3.235	<.0001
123. Displays negative attitudes towards the correctional system?	6945	allstg	2.748	2.337	3.231	<.0001
124. Takes pride in criminal exploits?	6809	allstg	4.065	3.403	4.849	<.0001
125. Displays non-conforming attitudes towards society?	6969	allstg	2.910	2.352	3.638	<.0001
126. Values a substance abusing lifestyle?	6879	allstg	1.347	1.144	1.588	.0004
127. Disrespects personal belongings?	6932	allstg	1.294	1.102	1.520	.0017
128. Disrespects public or commercial property?	6892	allstg	1.197	1.013	1.412	.0337
129. Attitudes support instrumental/goal oriented violence?	6940	allstg	3.706	3.094	4.461	<.0001
130. Attitudes support expressive/emotional violence?	6868	allstg	2.135	1.813	2.516	<.0001
131. Denies crime or uses excuses to justify or minimize crime?	6967	allstg	1.177	0.997	1.391	.0554
132. Has previously been referred to programs addressing deficit(s)?	6943	allstg	1.036	0.844	1.263	.7307
133. Previous offences youth court	7010	allstg	3.078	2.598	3.658	<.0001
134. Fifteen or more convictions [youth]	6916	allstg	3.490	2.831	4.284	<.0001
135. Ten to fourteen convictions [youth]	6912	allstg	3.550	2.966	4.240	<.0001
136. Five to nine convictions [youth]	6910	allstg	3.483	2.957	4.100	<.0001
137. Two to four convictions [youth]	6907	allstg	3.393	2.879	4.005	<.0001
138. One conviction [youth]	6907	allstg	3.201	2.701	3.805	<.0001
139. Scheduled convictions [youth]	6934	allstg	3.379	2.871	3.976	<.0001
140. Community supervision [youth]	6935	allstg	3.302	2.796	3.908	<.0001
141. Open custody [youth]	6892	allstg	2.698	2.284	3.183	<.0001
142. Secure custody [youth]	6910	allstg	2.936	2.491	3.458	<.0001
143. Failure during community-based supervision [youth]	6804	allstg	3.502	2.975	4.124	<.0001
144. Disciplinary transfers from open to secure custody [youth]	6588	allstg	3.311	2.439	4.437	<.0001
145. Disciplinary reports while in secure custody [youth]	6372	allstg	3.481	2.705	4.446	<.0001
146. Attempt escape/UAL/escape from secure custody [youth]	6760	allstg	2.511	1.871	3.324	<.0001
147. Transfer from secure custody to adult facility [youth]	6846	allstg	4.118	2.629	6.291	<.0001
148. Previous offences adult court [adult]	7057	allstg	1.351	1.103	1.668	.0043
149. Fifteen or more convictions	7051	allstg	0.771	0.643	0.919	.0042
150. Ten to fourteen convictions	7051	allstg	0.966	0.821	1.134	.6706
151. Five to nine convictions	7050	allstg	1.124	0.957	1.322	.1571
152. Two to four convictions	7048	allstg	1.303	1.088	1.570	.0046

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
153. One conviction	7048	allstg	1.326	1.085	1.632	.0068
154. Scheduled convictions	7042	allstg	1.312	1.112	1.551	.0014
155. Community supervision	7036	allstg	1.026	0.865	1.221	.7697
156. Provincial terms	7037	allstg	1.424	1.200	1.697	<.0001
157. Federal terms	7052	allstg	1.003	0.840	1.195	.9697
158. Failure during community-based supervision	6983	allstg	1.179	1.003	1.389	.0473
159. Segregation for disciplinary infractions	6739	allstg	1.870	1.581	2.210	<.0001
160. Attempt escape/UAL/escapes	7018	allstg	0.719	0.571	0.896	.0041
161. Reclassified to higher levels of custody	6894	allstg	1.380	1.115	1.695	.0025
162. Failures on conditional release	7012	allstg	1.044	0.884	1.230	.6103
163. Less than 6 months since last incarceration	7036	allstg	2.134	1.791	2.536	<.0001
164. No crime free period of one year or more	7024	allstg	1.966	1.632	2.359	<.0001
165. Fifteen or more current convictions	7068	allstg	0.411	0.233	0.669	.0009
166. Ten to fourteen current convictions	7068	allstg	0.627	0.464	0.830	.0016
167. Five to nine current convictions	7067	allstg	0.951	0.803	1.122	.5520
168. Two to four current convictions	7064	allstg	0.995	0.830	1.199	.9593
169. One current conviction	7064	allstg	2.646	0.560	47.311	.3403
170. Scheduled current convictions	7063	allstg	1.166	0.954	1.435	.1399
171. Previous offences	7058	allstg	2.631	2.015	3.504	<.0001
172. Previous serious offences	7047	allstg	2.237	1.851	2.720	<.0001
173. Drug cultivation [previous]	7043	allstg	0.781	0.396	1.385	.4339
174. Drug trafficking [previous]	7040	allstg	1.769	1.472	2.118	<.0001
175. Drug importation [previous]	7041	allstg	1.237	0.293	3.566	.7291
176. Arson/fire-setting [previous]	7043	allstg	1.161	0.703	1.814	.5346
177. Use of prohibited weapons [previous]	7013	allstg	2.525	2.034	3.115	<.0001
178. Discharge firearms [previous]	7022	allstg	2.085	1.207	3.410	.0052
179. Forcible confinement/kidnapping [previous]	7038	allstg	1.291	0.898	1.806	.1505
180. Violent (assault, robbery) [previous]	7044	allstg	1.870	1.583	2.216	<.0001
181. Sexual offences [previous]	7042	allstg	0.489	0.331	0.695	.0002
182. Attempt murder [previous]	7046	allstg	1.707	0.696	3.598	.1948
183. Homicide [previous]	7045	allstg	1.259	0.583	2.403	.5190
184. Conspire to any of the above [previous]	7037	allstg	1.729	1.171	2.479	.0041

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
185.	Break and enter with commission of any of the above [previous]	7006	allstg	1.039	0.785	1.352	.7834
186.	Victims were children [previous]	6863	allstg	0.904	0.652	1.223	.5263
187.	Victims were handicapped/infirm [previous]	6792	allstg	0.430	0.070	1.397	.2439
188.	Victims were elderly [previous]	6776	allstg	0.552	0.247	1.059	.1043
189.	Three or more victims [previous]	6915	allstg	1.494	1.269	1.758	<.0001
190.	Two victims [previous]	6904	allstg	1.599	1.361	1.878	<.0001
191.	One victim [previous]	6903	allstg	1.808	1.524	2.153	<.0001
192.	Use of power/position/authority on victim [previous]	6891	allstg	1.125	0.899	1.395	.2938
193.	Threat of violence to victim [previous]	6803	allstg	1.843	1.568	2.168	<.0001
194.	Threaten victim with a weapon [previous]	6670	allstg	1.904	1.611	2.248	<.0001
195.	Violence used against victim [previous]	6936	allstg	2.026	1.721	2.391	<.0001
196.	Weapons used against victim [previous]	6730	allstg	2.358	1.983	2.798	<.0001
197.	Caused death to victim [previous]	7030	allstg	1.117	0.596	1.921	.7092
198.	Serious injury (wounding/maiming, disfiguring) to victim [previous]	6699	allstg	2.245	1.826	2.746	<.0001
199.	Minor injury (hitting, slapping, striking) to victim [previous]	6784	allstg	1.868	1.589	2.200	<.0001
200.	Serious psychological harm to victim [previous]	6294	allstg	1.349	1.075	1.677	.0083
201.	Moderate psychological harm to victim [previous]	6319	allstg	1.512	1.270	1.797	<.0001
202.	Mild psychological harm to victims [previous]	6369	allstg	1.590	1.344	1.880	<.0001
203.	Sentence length over 24 years [previous]	7051	allstg	1.351	0.212	4.847	.6909
204.	Sentence length 10 to 24 years [previous]	7051	allstg	0.597	0.251	1.195	.1880
205.	Sentence length 5 to 9 years [previous]	7050	allstg	0.748	0.539	1.012	.0703
206.	Sentence length 1 day to 4 years [previous]	7034	allstg	2.196	1.795	2.709	<.0001
207.	Current serious offences	7067	allstg	1.203	0.959	1.525	.1191
208.	Drug cultivation [current]	7066	allstg	0.708	0.332	1.321	.3208
209.	Drug trafficking [current]	7063	allstg	1.424	1.173	1.720	.0003
210.	Drug importation [current]	7062	allstg	0.283	0.087	0.673	.0132
211.	Arson/fire-setting [current]	7067	allstg	0.465	0.141	1.119	.1356
212.	Use of prohibited weapons [current]	7054	allstg	2.237	1.810	2.748	<.0001
213.	Discharge firearms [current]	7061	allstg	2.868	2.077	3.895	<.0001
214.	Forcible confinement/kidnapping [current]	7064	allstg	1.362	1.015	1.795	.0336
215.	Violent (assault, robbery) [current]	7065	allstg	1.344	1.146	1.576	.0003
216.	Sexual offences [current]	7063	allstg	0.119	0.071	0.187	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
217. Attempt murder [current]	7065	allstg	2.628	1.658	4.018	<.0001
218. Homicide [current]	7067	allstg	1.550	1.211	1.963	.0004
219. Conspire to any of the above [current]	7050	allstg	2.265	1.713	2.956	<.0001
220. Break and enter with commission of any of the above [current]	7060	allstg	1.526	1.155	1.987	.0022
221. Victims were children [current]	7046	allstg	0.243	0.162	0.350	<.0001
222. Victims were handicapped/infirm [current]	6990	allstg	0.385	0.117	0.922	.0621
223. Victims were elderly [current]	6994	allstg	0.335	0.142	0.660	.0046
224. Three or more victims [current]	7044	allstg	1.395	1.151	1.682	.0006
225. Two victims [current]	7043	allstg	1.301	1.102	1.532	.0017
226. One victim [current]	7040	allstg	0.995	0.842	1.179	.9553
227. Use of power/position/authority on victim [current]	7046	allstg	0.600	0.477	0.748	<.0001
228. Threat of violence to victim [current]	6963	allstg	1.459	1.242	1.712	<.0001
229. Threaten victim with a weapon [current]	6938	allstg	1.620	1.372	1.911	<.0001
230. Violence used against victim [current]	7045	allstg	1.660	1.416	1.948	<.0001
231. Weapons used against victim [current]	7017	allstg	2.189	1.851	2.584	<.0001
232. Caused death to victim [current]	7063	allstg	1.468	1.172	1.823	.0006
233. Serious injury (wounding, maiming, disfiguring) to victim [current]	6997	allstg	1.541	1.281	1.846	<.0001
234. Minor injury (hitting, slapping, striking) to victim [current]	7007	allstg	1.404	1.184	1.660	<.0001
235. Serious psychological harm to victim [current]	6743	allstg	0.709	0.589	0.849	.0002
236. Moderate psychological harm to victim [current]	6731	allstg	0.991	0.836	1.173	.9187
237. Mild psychological harm to victim [current]	6745	allstg	0.960	0.809	1.136	.6374
238. Sentence length over 24 years [current]	7065	allstg	1.305	0.946	1.760	.0922
239. Sentence length [current]	7065	allstg	1.566	1.226	1.979	.0002
240. Sentence length 5 to 9 years [current]	7064	allstg	1.839	1.567	2.158	<.0001
241. Sentence length 1 day to 4 years [current]	7060	allstg	1.207	0.596	2.887	.6353
242. Sex offence history (current or past)	7059	allstg	0.257	0.185	0.346	<.0001
243. Is currently serving a sentence for a sex offence	7058	allstg	0.101	0.055	0.168	<.0001
244. Has been convicted in the past for one or more sex offences	7055	allstg	0.462	0.307	0.668	<.0001
245. Is currently serving a sentence for a sex-related offence	7053	allstg	0.119	0.061	0.206	<.0001
246. Has previously been convicted of a sex-related offence	7054	allstg	0.446	0.274	0.685	.0005
247. Incest – current sentence	7056	allstg	<.0001	.	.077	.9532
248. Paedophilia – current sentence	7043	allstg	0.047	0.008	0.146	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
249. Sexual assault – current sentence	7055	allstg	0.113	0.058	0.195	<.0001
250. Other current sex offences (voyeurism, exhibitionism)	7057	allstg	<.001	.	.067	.9499
251. Incest – past sentence(s)	7049	allstg	.304	.050	0.972	.0979
252. Paedophilia – past sentence(s)	7044	allstg	0.262	0.080	0.623	.0085
253. Sexual assault – past sentence(s)	7052	allstg	0.564	0.373	0.817	.0040
254. Other previous sex offences (voyeurism, exhibitionism)	7049	allstg	0.121	0.020	0.378	.0030
255. Three or more victims	7047	allstg	0.143	0.056	0.294	<.0001
256. Two victims	7045	allstg	0.237	0.140	0.374	<.0001
257. One victim	7043	allstg	0.259	0.187	0.351	<.0001
258. Victims were female children (under 12 years)	7029	allstg	0.126	0.054	0.247	<.0001
259. Victims were female 12 to 17 years	7018	allstg	0.276	0.167	0.426	<.0001
260. Victims were female adults (18 to 64 years)	7028	allstg	0.331	0.198	0.518	<.0001
261. Victims were female elderly (65 years or older)	7038	allstg	<.001	.	0.904	.9669
262. Victims were male children (under 12 years)	7033	allstg	0.176	0.043	0.464	.0029
263. Victims were male 12 to 17 years	7033	allstg	0.225	0.055	0.598	.0109
264. Victims were male adults (18 to 64 years)	7040	allstg	0.305	0.017	1.419	.2423
265. Victims were male elderly (65 years or older)	7041	allstg	<.001	.	8.493	.9716
266. Current offence resulted in death or serious harm	7045	allstg	0.150	0.089	0.237	<.0001
267. Prior psychological assessments in relation to sex offences	7024	allstg	0.324	0.180	0.534	<.0001
268. Prior treatment/intervention in relation to sex offending	7040	allstg	0.288	0.137	0.529	.0003
269. Current treatment/intervention in relation to sex offending	7039	allstg	0.098	0.024	0.256	<.0001
270. Static risk at intake	7747	allstg				
[Medium vs. low]			3.033	2.131	4.463	<.0001
[High vs. low]			3.308	2.340	4.839	<.0001
271. Static risk at intake – low vs. medium/high	7748	allstg	0.314	0.215	0.440	<.0001
272. Static risk at intake – medium vs. low/high	7748	allstg	1.078	0.919	1.263	.3514
273. Static risk at intake – high vs. low/medium	7748	allstg	1.327	1.136	1.551	.0004
274. Dynamic risk at intake	7754	allstg				
[Medium vs. low]			4.269	2.367	8.682	<.0001
[High vs. low]			6.034	3.388	12.169	<.0001
275. Dynamic risk at intake – low vs. medium/high	7755	allstg	0.185	0.092	0.328	<.0001
276. Dynamic risk at intake – medium vs. low/high	7755	allstg	0.777	0.652	0.921	.0041

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
277.	Dynamic risk at intake – high vs. low/medium	7755	allstg	1.641	1.387	1.947	<.0001
278.	Reintegration potential at intake	7694	allstg				
	[Medium vs. HIGH]			2.471	1.884	3.286	<.0001
	[Low vs. HIGH]			4.028	3.096	5.324	<.0001
279.	Reintegration potential at intake – low vs. medium/high	7694	allstg	2.099	1.796	2.453	<.0001
280.	Reintegration potential at intake – medium vs. low/high	7694	allstg	0.890	0.758	1.042	.1502
281.	Reintegration potential at intake – high vs. low/medium	7694	allstg	0.314	0.240	0.404	<.0001
282.	Motivation at intake	7694	allstg				
	[Medium vs. HIGH]			2.903	2.132	4.059	<.0001
	[Low vs. HIGH]			4.783	3.405	6.865	<.0001
283.	Motivation at intake – low vs. medium/high	7694	allstg	1.891	1.563	2.277	<.0001
284.	Motivation at intake – medium vs. low/high	7694	allstg	1.077	0.910	1.279	.3925
285.	Motivation at intake – high vs. low/medium	7694	allstg	0.311	0.223	0.422	<.0001
286.	Accountability at intake	7653	allstg				
	[Medium vs. HIGH]			2.238	1.638	3.139	<.0001
	[Low vs. HIGH]			3.187	2.295	4.533	<.0001
287.	Accountability at intake – low vs. medium/high	7653	allstg	1.579	1.332	1.867	<.0001
288.	Accountability at intake – medium vs. low/high	7653	allstg	0.946	0.807	1.112	.5014
289.	Accountability at intake – high vs. low/medium	7653	allstg	0.422	0.288	0.546	<.0001
290.	Incompatibles	6770	allstg	2.601	2.199	3.077	<.0001
291.	Offender Security Level at intake	6030	allstg				
	[Medium vs. minimum]			4.609	3.277	6.701	<.0001
	[Maximum vs. minimum]			10.958	7.398	16.617	<.0001
292.	Offender Security Level at intake – low vs. medium/high	6030	allstg	0.190	0.131	0.266	<.0001
293.	Offender Security Level at intake – medium vs. low/high	6030	allstg	1.475	1.205	1.817	.0002
294.	Offender Security Level at intake – high vs. low/medium	6030	allstg	3.113	2.439	3.944	<.0001
295.	Custody Rating Scale at intake	7536	allstg				
	[Medium vs. minimum]			4.671	3.511	6.348	<.0001
	[Maximum vs. minimum]			9.473	6.972	13.106	<.0001
296.	Custody Rating Scale at intake – min vs. med/max	7536	allstg	0.177	0.131	0.235	<.0001
297.	Custody Rating Scale at intake – med vs. min/max	7536	allstg	1.300	1.107	1.529	.0014
298.	Custody Rating Scale at intake – max vs. min/med	7536	allstg	2.840	2.378	3.381	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.



	Predictor	<i>N</i>	<i>o/c</i>	<i>OR</i>	<i>95% CI</i>		<i>p</i>
299.	CRS – Institutional adjustment score	7536	allstg	1.018	1.016	1.020	<.0001
300.	CRS – Security risk score	7536	allstg	1.017	1.014	1.019	<.0001

Note. *N* is total sample (comparison and STG groups). *o/c* = outcome (comparison or STG group). *OR* = odds ratio. *95% CI* = confidence interval. <sup>a</sup> As part of the intake process, offender self-identify their ethnic status. North American Indian is one of the self-identified groups chosen to reflect ethnic status.

## Appendix B: Variables Retained for Principal Components Analysis

Predictor	
1.	Aboriginal – yes/no
2.	Race – white vs. all other
3.	Race – North American Indian vs. all other
4.	Race – Black vs. all other
5.	Race – Métis vs. all other
6.	Buddhist – yes/no
7.	Muslim – yes/no
8.	Native spirit – yes/no
9.	Other religion – yes/no
10.	No religious affiliation – yes/no
11.	Age at admission (dichotomized – 30 less, 30+)
12.	Violent offence – yes/no
13.	Homicide [index] – yes/no
14.	Assault [index] – yes/no
15.	Other violent [index] – yes/no
16.	Has less than grade 10 or equivalent?
17.	Has less than high school diploma or equivalent?
18.	Employment history is absent?
19.	Unemployed at the time of arrest?
20.	Job history has been unstable?
21.	Marketable job skills obtained through experience are limited?
22.	Job skills obtained through formal training are limited?
23.	Dissatisfied with job skills?
24.	Co-operative work skills are limited?
25.	Belief in oneself to improve employability is low?
26.	Work ethic can be described as poor?
27.	Limited attachment to family unit during childhood?
28.	Relations with parental figure were negative during childhood?

<b>Predictor</b>	
29.	Witnessed family violence during childhood?
30.	Family members criminally active during childhood?
31.	Attitudes support spousal violence?
32.	Associates with substance abusers?
33.	Has many criminal acquaintances?
34.	Has many criminal friends?
35.	Has contact with criminal family members?
36.	Has a criminal partner?
37.	Suspected affiliation with street gang/organized crime?
38.	Resides in a high crime area?
39.	Prosocial family support is limited?
40.	Prosocial support from friends is limited?
41.	Early age alcohol use?
42.	Has combined the use of alcohol and drugs?
43.	Early age drug use?
44.	Has gone on drug-taking bouts or binges?
45.	Has combined the use of different drugs?
46.	Regular drug use is part of the offender's lifestyle?
47.	Unstable accommodation?
48.	Financial instability?
49.	Constructive leisure activities are limited?
50.	Community attachment is limited?
51.	Use of community resources is limited?
52.	Displays narrow and rigid thinking?
53.	Problem recognition skills are limited?
54.	Ability to generate choices is limited?
55.	Gives up easily when challenged?
56.	Impulsive?
57.	Engages in thrill seeking behaviour?
58.	Has difficulty setting long-term goals?
59.	Has difficulty setting realistic goals?
60.	Time management skills are problematic?
61.	Manipulates others to achieve goals?
62.	Empathy skills are limited

Predictor	
63.	Frequently feels intense anger?
64.	Frequently suppresses anger?
65.	Frequently acts in an aggressive manner?
66.	Has low frustration tolerance?
67.	Frequently interprets neutral situations as hostile?
68.	Displays negative attitudes towards the criminal justice system?
69.	Displays negative attitudes towards the correctional system?
70.	Takes pride in criminal exploits?
71.	Displays non-conforming attitudes towards society?
72.	Values a substance abusing lifestyle?
73.	Disrespects personal belongings?
74.	Disrespects public or commercial property?
75.	Attitudes support instrumental/goal oriented violence?
76.	Attitudes support expressive/emotional violence?
77.	Denies crime or uses excuses to justify or minimize crime?
78.	Previous offences youth court
79.	Fifteen or more convictions [youth]
80.	Ten to fourteen convictions [youth]
81.	Five to nine convictions [youth]
82.	Two to four convictions [youth]
83.	One conviction [youth]
84.	Scheduled convictions [youth]
85.	Community supervision [youth]
86.	Open custody [youth]
87.	Secure custody [youth]
88.	Failure during community-based supervision [youth]
89.	Disciplinary transfers from open to secure custody [youth]
90.	Disciplinary reports while in secure custody [youth]
91.	Attempt escape/UAL/escape from secure custody [youth]
92.	Transfer from secure custody to adult facility [youth]
93.	Previous offences adult court [adult]
94.	Two to four convictions
95.	One conviction
96.	Scheduled convictions

Predictor	
97.	Provincial terms
98.	Segregation for disciplinary infractions
99.	Reclassified to higher levels of custody
100.	Less than 6 months since last incarceration
101.	No crime free period of one year or more
102.	Previous offences
103.	Previous serious offences
104.	Drug trafficking [previous]
105.	Use of prohibited weapons [previous]
106.	Discharge firearms [previous]
107.	Violent (assault, robbery) [previous]
108.	Conspire to any of the above [previous]
109.	Three or more victims [previous]
110.	Two victims [previous]
111.	One victim [previous]
112.	Threat of violence to victim [previous]
113.	Threaten victim with a weapon [previous]
114.	Violence used against victim [previous]
115.	Weapons used against victim [previous]
116.	Serious injury (wounding/maiming, disfiguring) to victim) [previous]
117.	Minor injury (hitting, slapping, striking) to victim [previous]
118.	Serious psychological harm to victim [previous]
119.	Moderate psychological harm to victim [previous]
120.	Mild psychological harm to victims [previous]
121.	Sentence length 1 day to 4 years [previous]
122.	Drug trafficking [current]
123.	Use of prohibited weapons [current]
124.	Discharge firearms [current]
125.	Forcible confinement/kidnapping [current]
126.	Violent (assault, robbery) [current]
127.	Attempt murder [current]
128.	Homicide [current]
129.	Conspire to any of the above [current]
130.	Break and enter with commission of any of the above [current]

Predictor	
131.	Three or more victims [current]
132.	Two victims [current]
133.	Threat of violence to victim [current]
134.	Threaten victim with a weapon [current]
135.	Violence used against victim [current]
136.	Weapons used against victim [current]
137.	Caused death to victim [current]
138.	Serious injury (wounding, maiming, disfiguring) to victim [current]
139.	Minor injury (hitting, slapping, striking) to victim [current]
140.	Sentence length [current]
141.	Sentence length 5 to 9 years [current]
142.	Static risk at intake [Medium vs. low] [High vs. low]
143.	Dynamic risk at intake [Medium vs. low] [High vs. low]
144.	Reintegration potential at intake [Medium vs. HIGH] [Low vs. HIGH]
145.	Motivation at intake [Medium vs. HIGH] [Low vs. HIGH]
146.	Accountability at intake [Medium vs. HIGH] [Low vs. HIGH]
147.	Incompatibles
148.	Offender Security Level at intake [Medium vs. minimum] [Maximum vs. minimum]
149.	Custody Rating Scale at intake [Medium vs. minimum] [Maximum vs. minimum]